Arizona Department of Transportation

Environmental Planning

Final
Atypical Events Report

State Route 202L (Santan Freeway)
from Val Vista to Interstate 10

Project No. 202L MA 44 F0124 01C
Federal No. 202-C(208)S

September 19, 2023

Submittal Number 2

Contents

Introduction

This report aims to provide the United States Environmental Protection Agency (U.S. EPA) with a robust rationale for the exclusion of three specific dates from the State Route 202 Loop Santan Freeway Project (SR 202L) background particulate matter (PM) concentration data. These dates stand out as atypical when compared to the air quality levels and meteorological conditions of the project site. Consequently, the U.S. EPA seeks justification for categorizing these dates as atypical events that warrant their removal from the background concentration analysis.

This report demonstrates that these dates and their instances of exceeding the National Ambient Air Quality Standards (NAAQS) for 24-hour particulates measuring 10 microns or less (PM_{10}) should be disregarded in the projects PM_{10} background concentration calculations and the projects assessments of NAAQS exceedance or violations. This recommendation is made due to the dates' air quality characteristics being unique and uncontrollable due to meteorological conditions, which distinguishes them from typical conditions at the project site. This report provides an introductory summary of the project and the regulatory purpose of the report, the projects calculated PM_{10}background concentrations before and after removing the dates considered atypical to that of standard air quality conditions, and a description of the dates meteorological and air quality conditions that occurred and resulted in 24-hour PM_{10} NAAQS exceedance.

1.0 Project Description

The Arizona Department of Transportation (ADOT), in consultation with Federal Highway Administration (FWHA) is planning to install general purpose lanes (GPL) for the State Route 202 Loop Santan Freeway (SR 202L) between milepost (MP) 50.6 and MP 42.2 in the City of Chandler and the Town of Gilbert in Maricopa County, Arizona. Pursuant to 23 U.S.C. 326 and a January 4th, 2021, Memorandum of Understanding and executed by FHWA, all environmental review, consultation, and other required actions applicable to Federal environmental laws will for the Project be conducted by ADOT. The project is included in the Maricopa Association of Governments (MAG) 2022 – 2023 MAG Transportation Improvement Program (TIP) and MOMENTUM 2050 MAG Regional Transportation Plan, and regional conformity analysis 7322. The project is in the Maricopa County Nonattainment Area for particulates 10-microns in diameter or less (PM_{10}), eight-hour ozone (O_3), and a maintenance area for carbon monoxide.

The SR 202L section consisting of the project area is a six-lane divided freeway with one high-occupancy-vehicle (HOV) lane in each direction. As a part of the Phoenix Metropolitan Area's Regional Freeway system, the freeway connects to Interstate 10, serves as the end connection to State Route 101 (SR 101), and connection to the South Mountain Freeway. To address an increase in traffic congestion and peak traffic periods resulting in traffic increases, the purpose of the project is to increase freeway capacity while decreasing existing and future traffic congestion.

The scope of work consists of:

- Construct one GPL to the outside of existing lanes in each direction of SR 202L from Gilbert Road to Val Vista Drive
- Construct two GPL to the outside of existing lanes in each direction of SR 202L between SR 101 and Gilbert Road
- Realign entrance and exit ramps to accommodate new GPLs and modify exits to accommodate 2 lanes (1 auxiliary and 1 option lane)
- Mill and replace the AR-ACFC of the existing roadway
- Widen the following overpass (OP) bridges:
    - Arizona Ave (structure # 2693)
    - SR 202L mainline (structure #s 2678 and 2679) and Ramp C (structure # 2676) over Union Pacific Railroad (UPRR)
    - Consolidated Canal (structure #s 2683 and 2684)
    - Lindsay Rd (structure #s 2789 and 2790)
- Relocate the Arizona Ave Ramp D UPRR OP bridge (structure # 2677)
- Construct retaining walls that will have the same design patterns as the existing walls in the corridor
- Cut back abutment slopes where it is necessary to accommodate new lanes or changes in the ramps
- Relocate catch basins, storm drain and storm drain trunk lines and junction structures
- Reconstruct stormwater channel side-slopes and maintenance paths
- Construct three new sound walls
- Relocate existing sound wall at the Lindsay Rd TI OP
- Reconstruct existing sound wall north of SR 202L east of Cooper
- Restripe the roadway
- Remove, replace, and/or upgrade traffic signs
- Relocate, replace, and/or protect in place existing sign/DMS structures
- Relocate elements of the DMS as necessary due to the mainline and ramp widening

- Relocate and/or construct new ramp metering systems where ramps are being widened or realigned
- Replace existing traffic counters and other detection loops
- Replace existing High Pressure Sodium luminaries with LED luminaries
- Relocate and/or protect in place existing luminary poles
- Reconstruct crash attenuators at ramp gores where gore locations are affected by ramp widenings or realignments
- Restore landscaped areas disturbed by construction to match existing conditions, including replacing irrigation lines
- Repaint base and accent colors on bridges, walls, and other painted features affected by the new construction
- Upgrade sidewalk ramps and signal poles to ADA compliance at TIs, as necessary

2.0 Regulatory Standards

Per U.S. EPA guidelines, specific transportation projects now necessitate a quantitative assessment of PM_{10} impacts in proximity to roadways. This PM hotspot evaluation entails estimating the background PM_{10} concentration levels associated with the project. This estimation involves using a 3-year dataset of historical air quality information to establish the PM_{10} background value. This calculated background value is then added to the project's PM_{10} value to determine if the project's emissions might result in exceeding the National Ambient Air Quality Standards (NAAQS). Should the background concentration surpass the NAAQS, a build versus no-build project analysis becomes necessary.

The data used to determine the background concentration includes 24-hour average pollutant levels and annual means, excluding atypical air quality events. If the chosen 3-year period for determining the project's background concentration encompasses atypical air quality events, those events can be excluded from the analysis. This is done to mitigate the influence of outliers in air quality data stemming from uncontrollable air quality events, which could lead to NAAQS exceedances.

The U.S. EPA defines exceptional events as "events are unusual or naturally occurring events that can affect air quality but are not reasonably controllable using techniques that tribal, state or local air agencies may implement in order to attain and maintain the National Ambient Air Quality Standards (NAAQS)[1]." These events may include wildfires, high wind dust events (dust storms), prescribed fires, stratospheric ozone intrusions, and volcanic and seismic activities. In 2016, the U.S. EPA finalized the Exceptional Events Rule (EER) to establish regulations and procedures for determining if air quality data has been influenced by exceptional events. The EER ensures air quality measurements and analysis are properly evaluated regarding their cause to avoid imposing unreasonable planning or air quality NAAQS permitting requirements on air quality agencies and municipalities due to atypical events.

If the air quality data indicates an exceptional, extreme, or unrepresentative air quality event that is not influenced by relevant regulatory determinations, it falls outside the scope of the EER. In 2019, the U.S. Environmental Protection Agency (EPA) issued the Additional Methods, Determinations, and Analyses to Modify Air Quality Data memorandum acknowledging certain EPA determinations and analyses that utilize ambient air quality data that are not subject to the EER, but still are related to an exceptional event meteorological and PM_{10} exceedance qualification criteria. The EPA memorandum outlines data modification analysis of air quality event types not encompassed by or subject to determinations by the EER but fall within EPA's Guideline on Air Quality Models in 40 CFR Part 51, Appendix W including preparation of required "hot spot" analysis for particulate matter concerning transportation conformity assessments for specific projects under 40 CFR Part 93[2].

40 CFR 51 Appendix W Guideline to Air Quality Models provides modeling techniques and guidelines for State Implementation Plan (SIP) submittals and revisions, and to New Source Review (NSR), including new or modifying sources under Prevention of Significant Deterioration (PSD),1 2 3. Section 8.3.2 of 40 CFR 51 was developed to clarify and reaffirm that Appendix W still applies to atypical events, and it is not necessary to go through the exceptional event determination process to qualify an atypical event. Specifically, Appendix W states that there may be circumstances which necessitate modifications to PM_{10} background concentrations that include the removal of data from specific days or hours when a monitor

[1] U.S. EPA, *Treatment of Air Quality Data Influenced by Exceptional Events*, Accessed August 16th, 2023. https://www.epa.gov/air-quality-analysis/treatment-air-quality-data-influenced-exceptional-events-homepage-exceptional

[2] U.S. EPA, *Additional Methods, Determinations, and Analyses to Modify Air Quality Data Beyond Exceptional Events Memo*, 2019. Accessed August 19th, 2023. https://www.epa.gov/sites/default/files/2019-04/documents/clarification_memo_on_data_modification_methods.pdf

is affected by air quality activities that are not typical or not expected to reoccur in the future[3]. These adjustments would make the monitored background concentrations more spatially and temporally representative of areas around the new and modified source from project activity, for use in regulatory air quality assessments including this projects transportation conformity assessment.

EPA Region 9 recommends examining several criteria for determining whether an event is appropriate to exclude from a project's background concentrations:

1. Hourly and 24-hour average PM_{10} exceedances at multiple air monitors in the specified areas indicating it's a regional air quality event.
2. Windspeed conditions greater than 25 mph consistent with an increase in hourly PM_{10}
3. Reduced visibility to less than 10 miles consistent with increases in hourly PM10 concentrations.
4. National Weather Service (NWS) wind/dust advisories consistent with an increase in hourly PM_{10} concentrations.
5. Summaries of dust complaints and/or notices of PM_{10} violations; if dust complaints are received, or dust complaints do not involve anthropogenic source(s) located upwind of an exceeding monitor.

Data integrated into this procedure, which is deemed irregular compared to standard conditions and not eligible for EER regulatory determinations, is eligible for modification regarding the area's baseline concentrations. This modification process involves making necessary adjustments to monitored baseline concentrations to represent the spatial and temporal air quality conditions of the area more accurately. Consequently, this document regards the three requested days as atypical in their meteorological and PM_{10} characteristics and proposes their removal from the PM "hot spot" baseline analysis for the project. The goal is to enhance the accuracy of the projects area's baseline concentrations by excluding these days from consideration, without going through a formal EER determination process.

The Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division's Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021 report (MCAQD Atypical Events Report) provides detailed information about what days had the highest 24-hour average PM_{10} concentrations at the Higley and West Chandler Air Monitoring Sites. The days identified are proposed to be considered atypical events, due to the occurrence of high wind conditions and dust storms. As such, Maricopa County justifies that it is inappropriate to consider these days when calculating the project's hot spot analysis background PM_{10} concentrations. To provide justification for these dates exclusion, the report discusses air pollution forecasts issued by Arizona Department of Environmental Quality (ADEQ), NWS historical weather forecasts, National Oceanic and Atmospheric Association (NOAA) weather station data, and 24-hour average PM_{10} concentrations for air quality monitoring stations in the general Phoenix metropolitan area (Phoenix area).

MCAQD, as the designated air quality reporting agency for the SR 202L project, has furnished a Maricopa County Atypical Events Report, accessible in **Appendix A**. MCAQD's Atypical Events Report has been utilized as a point of reference for the dates under consideration as atypical in this summary report. Furthermore, MCAQD's report contains supplementary data on additional dates that also had atypical event characteristics during the three-year evaluation period scrutinized for the PM_{10} background concentration calculations of the Project. However, for the purpose of identifying atypical event days in this report, per EPA Region 9 criteria, only three dates are discussed from the MCAQD Atypical Events Report including: March 3rd, 2021, July 9th, 2021, and October 11th, 2021. Details on these three dates are provided in Section 4.0.

[3] U.S. EPA, Guidelines on Air Quality Models, 40 CFR Appendix-W-to-Part-51 8.08.3.2.

3.0 Project PM_{10} Background Concentrations, Without Removing Atypical Events

There are two monitors in the vicinity of the project site. The West Chandler PM monitor (West Chandler) is 0.5 miles from the project and Higley PM monitor (Higley) is 2.5 miles from the project. **Figure 1** identifies the project location below.

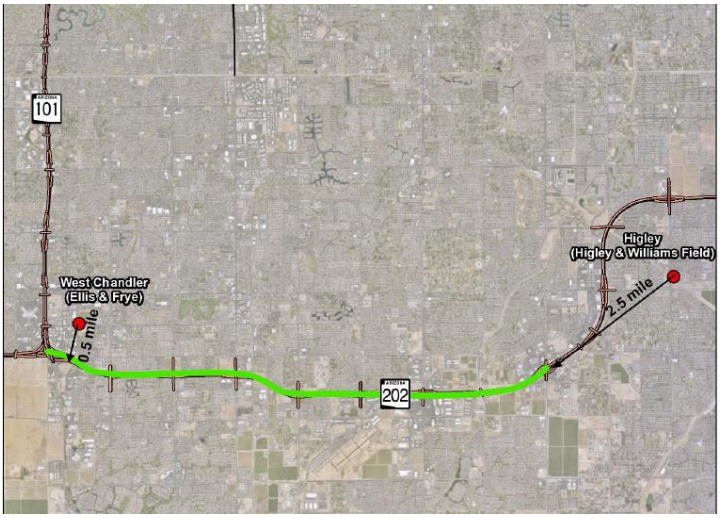


Figure 1: Project location map and proximity to West Chandler and Higley monitoring stations.

Using the U.S. EPA's Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas, the project's background PM_{10} levels were calculated by interpolating 2019 through 2021 PM_{10} concentrations between the two nearest monitoring stations (West Chandler and Higley). The 4th highest PM_{10} reading from 2019 through 2021 was identified from each monitoring station, and then used to interpolate the projects PM_{10} background concentrations. **Table 1** shows the number of completed monitoring days and highest 24-hour typical readings for 2019 through 2021 for the West Chandler and Higley Stations.

Table 1: Project Monitoring station Highest 24-hour PM_{10} Readings, Without Removing Atypical Events

West Chandler Station			
Data Year	**2019**	**2020**	**2021**
Number of Readings	365	362	364
1st	76	263	181
2nd	71	89	165
3rd	67	80	160*
4th	66	74	153
Higley Station			
Data Year	**2019**	**2020**	**2021**
Number of Readings	365	364	357
1st	114	131*	219
2nd	91	107	207
3rd	91	106	134
4th	89	92	130

Source: https: U.S. EPA Outdoor Air Quality Data, Download Daily Air Quality Data, https://www.epa.gov/outdoor-air-quality-data/download-daily-data
Note: *4th highest 24-hour readings are highlighted in red, without removing atypical events.

Table 1 shows that without considering atypical events, the West Chandler monitor's 4th highest value over three years (2019-2021) is 160 µg/m^3. This comes from a total of 1091 days of sampling. For the Higley monitor, over the same three-year period, the 4th highest value is 131 µg/m^3 from 1086 days of sampling.

The predicted background concentration, without removing atypical events, of the project is:

$$0.83 \times 160 + 0.17 \times 131 = \mathbf{155.1}\ \mu g/m^3$$

Per 40 CFR 50, Appendix K, the Maricopa County NAAQS threshold for PM_{10} 24-hour average concentration threshold is 150 µg/m^3. As such, the predicted PM_{10} background concentration exceeds the PM_{10} NAAQs threshold. **Table 2** compares the background concentration to the PM_{10}NAAQS threshold.

Table 2: PM_{10} NAAQS Threshold & Projects Calculated Background PM_{10} Concentrations

West Chandler Station			
4th Highest 24-hour Average PM_{10} Concentration without Atypical Event Data Exclusion (µg/m^3)	PM_{10} National Ambient Air Quality Standards (NAAQS)	Difference (µg/m^3)	Exceeds Threshold?
160	150	10	Yes
Higley Station			
4th Highest 24-hour Average PM_{10} Concentration without Atypical Event Data Exclusion (µg/m^3)	PM_{10} National Ambient Air Quality Standards (NAAQS)	Difference (µg/m^3)	Exceeds Threshold?
131	150	19	No
Project PM_{10} Background Concentration Levels			
Background PM_{10} Concentration without Atypical Event Data Exclusion (µg/m^3)	PM_{10} National Ambient Air Quality Standards (NAAQS)	Difference (µg/m^3)	Exceeds Threshold?
155.1	150	5.1	Yes

As shown in **Table 2**, the interpolated project PM_{10} background concentrations are higher than PM_{10} NAAQS threshold, without removing atypical event day data from the analysis. This can be attributed to several days within the three-year evaluation period being classified as atypical events. As such, the background concentration levels that include atypical event data are unrepresentative of the projects standard average PM_{10} background concentrations and should not be considered during the projects PM_{10} background concentration calculations.

4.0 Atypical Event Days

Hourly and daily PM_{10} data for the years 2019 through 2021 was obtained for the selected West Chandler and Higley monitors from the EPA AirData website to be evaluated for the projects PM_{10} background concentration calculations. Within these three years of data, the following dates are being proposed to be considered as atypical events:

- March 3rd, 2021
- July 7th, 2021,
- October 11th, 2021

The dates above are being proposed to be excluded from the projects PM_{10} background concentration calculations per guidelines listed in 40 CFR Part 51, Appendix W, Section 8.3.2.c.ii for the 40 CFR Part 53 transportation conformity portion of the project. Monitoring data for these three days proposed to being removed was obtained from MCAQD's Atypical Events Report and checked to ensure that it meets the EPA's 75% data completeness criteria[4]. **Table 3** summarizes the days recommended for exclusion due to atypical-type events.

The three days proposed for removal from the background concentration analysis are considered atypical in nature because they fit the EPA Region 9's 5-criteria for the data background modification of atypical events (Section 2.0). For the three days proposed, the West Chandler and Higley monitoring sites showed hourly and 24-hour average PM_{10} exceedances and the Phoenix area's windspeed conditions were recorded to be greater than 25 mph. These records coincide with an increase in hourly PM_{10} concentrations throughout the Arizona region consistent with reduced visibility to less than 10 miles identified in NWS and ADEQ pollution reports, wind dust advisories, dust complaints received, and notices of PM_{10} violations.

Table 3: Higley and West Chandler Monitoring stations PM_{10} NAAQS Atypical Events Days Data

Station	Date	24-hour Average PM_{10} Concentration ($\mu g/m^3$)	PM_{10} NAAQS Exceedances flagged as an Atypical Event	Identified as an Atypical Event
Higley	3/3/2021	208*	Yes	Yes
	7/9/2021	131.2	No	Yes
	10/11/2021	134.7	No	Yes
West Chandler	3/3/2021	154.3	Yes	Yes
	7/9/2021	166.4*	Yes	Yes
	10/11/2021	160.9	Yes	Yes

Source: U.S. EPA Outdoor Air Quality Data, Download Daily Air Quality Data, https://www.epa.gov/outdoor-air-quality-data/download-daily-data
Notes: *Highest 24-Hr average PM_{10} concentration reading identified during 3-year period's atypical events days.

Data from nearby monitors, identified in **Appendix A**, were also flagged for high PM_{10} concentrations on the atypical events days, indicating that the atypical air quality events were widespread and regional in nature. Windspeed data was collected from the NOAA Phoenix Sky Harbor Airport Weather Station to

[4] U.S. EPA, Office of Air Quality Planning and Standards, Guideline on Data Handling Conventions for the PM NAAQS, April 1999, Table 8-1. Accessed September 17th, 2023. https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/19990401_oaqps_epa-454_r-99-009_guideline_data_handling_pm_naaqs.pdf

justify that atypical events were regional in nature and affected the Phoenix area as whole, rather than just the project area. Although windspeed's at the West Chandler and Higley monitoring stations did not exceed 25 mph for some of the proposed atypical event days, windspeed data at the NOAA Phoenix Sky Harbor Airport Weather Station was referenced to demonstrate there were sustained windspeeds of greater than 25 mph in the Phoenix area.

The MCAQD Atypical Events Report provided in Appendix **A's** Appendix II includes maximum hourly sustained windspeed and wind gust data for the three days being proposed as atypical. However, it does not list the maximum 24-hour sustained windspeed and wind gust measurements for July 9th and October 11th, 2021, as recorded measurements fell between the hourly data points. On March 3rd, 2021, the maximum hourly windspeed and wind gust data align with the 24-hour maximum windspeed and wind gust values, as they represent the same maximum 24-hour measurements. As such, to demonstrate that all three days meet the atypical event criteria of windspeeds exceeding 25 mph, **Table 4** presents the three days maximum sustained windspeeds and gust speeds from the NOAA Phoenix Sky Harbor Airport Weather Station's monitoring data. For more detailed NOAA Phoenix Sky Harbor Airport Weather Station data referenced in Table 4, please refer to **Appendix B**.

Table 4: NOAA Phoenix Sky Harbor Airport Weather Station (WBAN:23183) Windspeed for Atypical Events Days

Date	Max Wind Gust Speed (mph)	Time Recorded	Max Sustained Windspeed (mph)	Time Recorded	Windspeed Qualifies in an Atypical Event? (> 25 mph)
3/3/2021	47	4:51 P.M.	30	3:51 P.M.	Yes
7/9/2021	46	10:45 P.M., 10:49 P.M., & 10:51 P.M.	30	10:45 P.M.	Yes
10/11/2021	46	10:44 P.M.	28	10:44 P.M.	Yes

Source: U.S. Department of Commerce National Centers for Environmental Information National Oceanic & Atmospheric Administration, *National Environmental Satellite, Data, and Information Service for Phoenix Airport Station, AZ US WBAN:23183 (ICAO:KPHX), Local Climatological Data - Hourly Observations for 03/03/21, 07/09/21 & 10/11/21*. https://www.ncdc.noaa.gov/cdo-web/datasets/LCD/stations/WBAN:23183/detail

For more details on windspeed data for the proposed atypical event days at the West Chandler, Higley Stations, and nearby monitoring stations please refer to **Appendix A**.

Meteorological conditions, beyond control, like high temperatures, low precipitation, atmospheric pressure changes, along with wildfires and strong winds, can lead to emissions spikes. Consequently, the dates discussed in this summary report are marked by a combination of meteorological conditions, strong winds, and fire occurrences resulting in naturally occurring, uncontrollably higher than average regional and project PM_{10} background concentrations. As such, these days are subject to atypical event review per 40 CFR Part 51, Appendix W, Section 8.3.2.c.ii.

March 3rd, 2021, Atypical Event

A high-wind event due to a low-pressure system moving through the state occurred on this date, with wind gusts reaching up to 45 mph at the NOAA Phoenix Sky Harbor Airport Weather Station (**Table 5**). This caused widespread blowing dust throughout the region. Nine monitoring sites, in both Maricopa and Pinal counties, exceeded the 24-hour PM_{10} NAAQS due to this storm. For more details on all monitoring sites that exceeded the 24-hour PM_{10} NAAQS during this atypical event date besides West Chandler and Higley, please refer to **Appendix A.**

According to ADEQ's pollution forecast for March 3rd, 2021, winds between 20 and 30 mph were forecasted with possible chances for precipitation and the NWS issued a Red Flag Warning in effect from 11:00 A.M. to 6:00 P.M[5]. Red Flag Warning weather conditions consist of warm temperatures, low humidity, and strong winds which can increase the risk of fire danger.[6] On March 3rd, 2021, these conditions resulted in a high wind event and elevated PM_{10} concentrations. **Table 5** shows the windspeed levels and the highest PM_{10} concentration recorded for March 3rd, 2021, at the West Chandler and Higley Stations.

Table 5: Windspeed and PM_{10} Data for March 3rd, 2021

Site	24-hour average PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Windspeed (MPH)	Time	Max Wind Gust (MPH)	Time
West Chandler	153*	20.8	4:00 P.M.	42.9	4:00 P.M.
Higley	207*	22.3	4:00 P.M.	45.3	5:00 P.M.

Source: Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division, *Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021*, March 3rd, 2021, Atypical Event, **Table 6, Page 20**.
Notes: *Measurement exceeds PM_{10} NAAQS.

Gusty winds, with maximum hourly average windspeeds slightly lower than 25 mph, were recorded at the West Chandler and Higley monitors on March 3rd, 2021. Both the West Chandler and Higley Stations experienced wind gusts of over 25 mph on March 3rd, 2021, with West Chandlers' maximum wind gust speed being 42.9 mph and Higley's being 45.3 mph[7]. Per NOAA Phoenix Sky Harbor Airport Weather Station data, the highest windspeed for March 3rd, 2021, recorded was 30 mph at 3:51 P.M. Additionally, throughout the Phoenix area, wind gust speeds were recorded over 25 mph and nine PM monitors recorded PM_{10} concentrations over NAAQS thresholds, including West Chandler. For more details on these additional monitors please refer to **Appendix A**. High PM_{10} concentrations observed on March 3rd, 2021, coincided with windy conditions in the project area (maximum wind gust speeds of 42.9 mph at the West Chandler and 45.3 mph at Higley Stations) as shown in **Figures 2** and **3** below. 5-minute windspeed and PM_{10} concentration data from the MCAQD Atypical Events Report for the West Chandler and Higley stations is plotted in **Figures 2** and **3**.

[5] Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division, *Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021*, March 3rd, 2021, Atypical Event, **Pages 19-27**. Accessed September 18th, 2023.
[6] National Weather Service, *Red Flag Warning*. Accessed August 17th, 2023. https://www.weather.gov/mqt/redflagtips
[7] Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division, *Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021, March 3rd, 2021, Atypical Event*, **Table 6, Page 20.** Accessed September 18th, 2023.

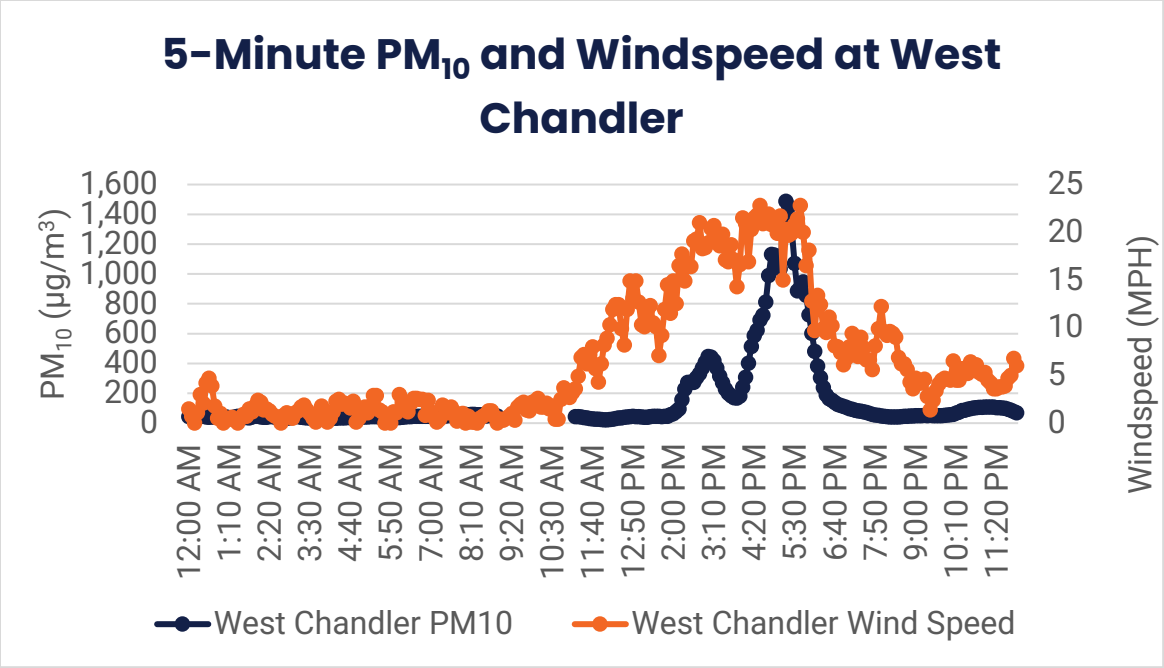


Figure 2: 5-Minute PM_{10} concentrations ($\mu g/m^3$) and windspeed (mph) at West Chandler monitoring station on March 3rd, 2021.

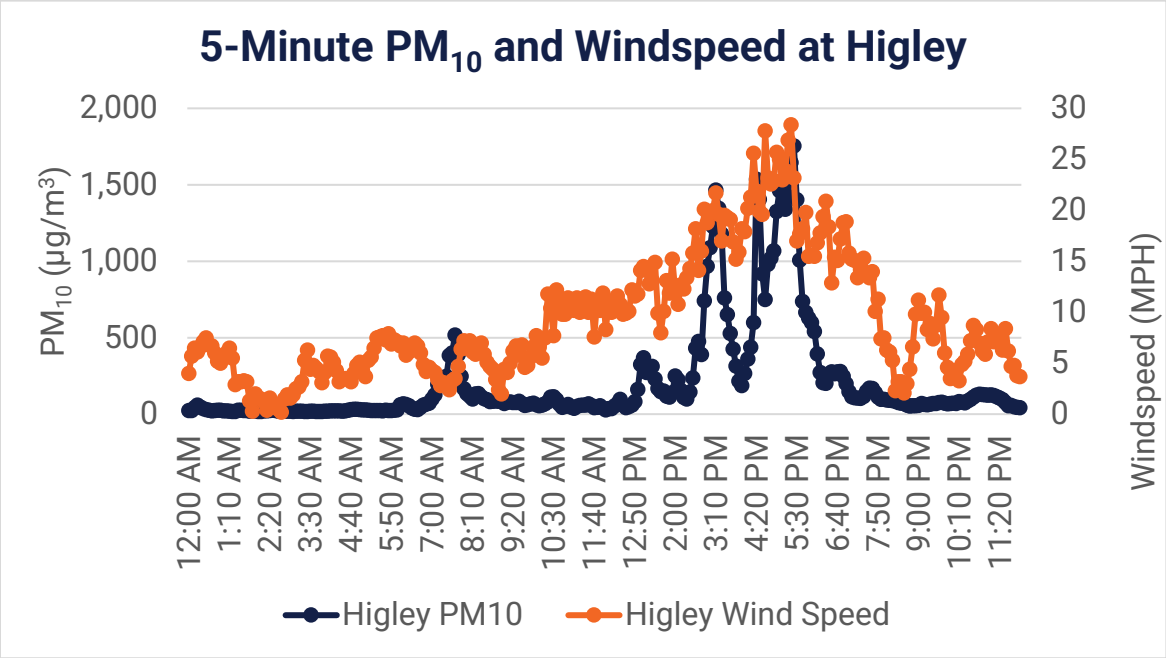


Figure 3: 5-Minute PM_{10} concentrations ($\mu g/m^3$) and windspeed (mph) at Higley monitoring station on March 3rd, 2021.

Figures 2 and **3** show that as windspeeds increased on March 3rd, 2021, at the Higley and West Chandler stations, 5-Minute PM_{10} concentrations rose relatively as well to over 1,000 µg/m^3, indicating dust storm activity[8]. 5-Minute windspeeds at West Chandler and Higley are greater than 25 mph, peaking around 27 mph between 4:20 P.M. and 5:30 P.M. At the peak of these high winds PM_{10} concentrations were the highest, with 24-hour average concentrations being recorded as 153 µg/m^3 at West Chandler and 207 µg/m^3 at Higley, and at 4:00 P.M. both stations' PM_{10} concentrations exceeded NAAQS.

An evaluation of all air quality inspections and complaints between February 28th, 2021, and March 6th, 2021, indicates no evidence of unusual anthropogenic PM_{10} emissions. During the 7-day period, 58 air quality related events were received, with 50 of them related to windblow dust or PM_{10}. For more details on these complaints, please refer to **Appendix A**.

Blowing dust, haze, and dust storms were reported on March 3rd, 2021, along with reduced visibilities throughout the Phoenix area. The pictures below show ADEQ's Visibility Camera Historical Archive photos of the Phoenix area at the time prior to and during the dust storm on March 3rd, 2021. The pictures on the left show the area prior to the storm and the pictures on the right show the area with reduced visibility during the storm. Note the storm hit the Phoenix area around 12:00 P.M and was at its peak at 4:00 P.M.

South Mountain Camera, 12:00 P.M.

South Mountain Camera, 4:45 P.M.

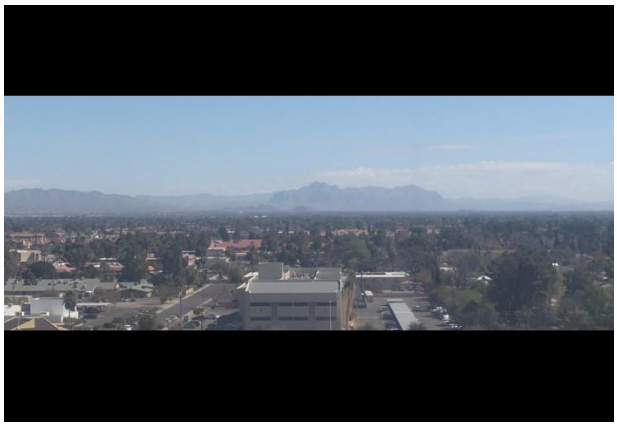
Camelback Mountain Camera, 1:00 P.M.

Camelback Mountain Camera, 3:45 P.M.

Superstition Mountains Camera, 12:00 P.M.

Superstition Mountains Camera, 5:00 P.M.

[8] Maricopa County Air Quality Department, *Maricopa County Air Quality Status Map – 1-Hour PM_{10} and Windspeed Historical Data for West Chandler and Higley Monitoring Stations*, March 3rd, 2021, **Page 26**. Accessed August 16th, 2023. https://maricopaco.agilaire.com/AirVision/



July 9th, 2021, Atypical Event

Summer monsoon storm activity resulting in a high wind event consisting of a widespread blowing dust throughout the Phoenix Area occurred on July 9th, 2021, with wind gusts reaching up to 63 mph at the NOAA Phoenix Sky Harbor Airport Weather Station (**Table 6**). Five monitoring sites in Maricopa County exceeded the 24-hour PM_{10} NAAQS on this date, including the West Chandler Monitoring station. For more details on all monitoring sites besides West Chandler that exceeded the 24-hour PM_{10} NAAQS during this atypical event, please refer to **Appendix A.**

According to ADEQ's pollution forecast for July 9th, 2021, storms occurred across the northern and eastern portions of the Phoenix Valley, with a high chance of outflow winds in the east and northeast and resulting in isolated pockets of dust[9]. On July 9th, 2021, these stormy conditions caused high winds, isolated dust storms, and elevated PM_{10} concentrations at the West Chandler and Higley monitoring stations. According to the NWS forecast discussion for the July 9th, 2021, favorable atmospheric conditions for convection were observed, and an increase in temperature caused mixing of the inversion layer. These atmospheric changes, including convection and alterations in atmospheric pressure, contributed to the occurrence of storms in the Phoenix Valley. These storms produced localized phenomena such as strong 40 to 60 mph wind gusts, outflow winds, and heavy rainfall. **Table 6** shows the windspeed levels and the highest PM_{10} concentrations recorded for July 9th, 2021, at the West Chandler and Higley monitoring stations.

Table 6: Windspeed and PM_{10} Data for July 9th, 2021

Site	24-hour average PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Windspeed (MPH)	Time	Max Wind Gust (MPH)	Time
West Chandler	165*	13.0	10:00 P.M.	47.5	10:00 P.M.
Higley	130	21.1	10:00 P.M.	63.8	10:00 P.M.

Source: Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division, *Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021*, July 9th, 2021, Atypical Event**, Table 10, Page 37**.
Notes: *Measurement exceeds PM_{10} NAAQS.

[9] Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division, *Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021,* July 9th, 2021, Atypical Event, **Pages 36 – 43**. Accessed September 18th, 2023.

Gusty winds were recorded at the West Chandler and Higley monitors on July 9th, 2021. Throughout the Phoenix area, wind gusts were recorded over 25 mph and five PM monitors recorded PM_{10} concentrations over NAAQS thresholds. The West Chandler and Higley stations recorded wind gusts surpassing 25 mph, with maximum wind gust speeds of 47.5 mph at West Chandler and 63.8 mph at Higley[10]. Per NOAA Phoenix Sky Harbor Airport Weather Station data, the highest windspeed for July 9th, 2021, recorded was 30 mph at 10:45 P.M. Increases in PM_{10} concentrations observed on July 9th, 2021, coincided with these high wind conditions (maximum wind gust speeds over 63 mph at Higley Station) in the project area as shown in **Figures 4** and **5** below. 5-Minute windspeed and PM_{10} concentration data from the MCAQD Atypical Events Report for the West Chandler and Higley stations is plotted in **Figures 4** and **5**.

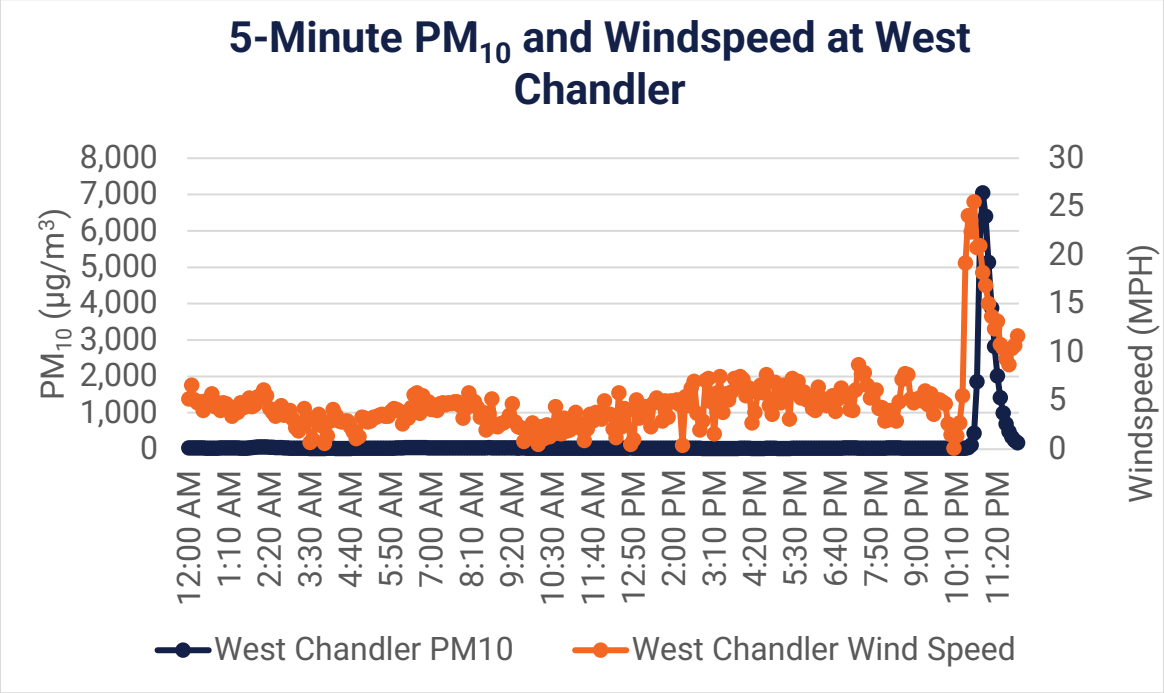


Figure 4: 5-Minute PM_{10} concentrations ($\mu g/m^3$) and windspeed (mph) at West Chandler monitoring station on July 9th, 2021.

[10] Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division, *Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021*, July 9th, 2021, Atypical Event, **Table 10, Pages 37-38**. Accessed August 16th, 2023.

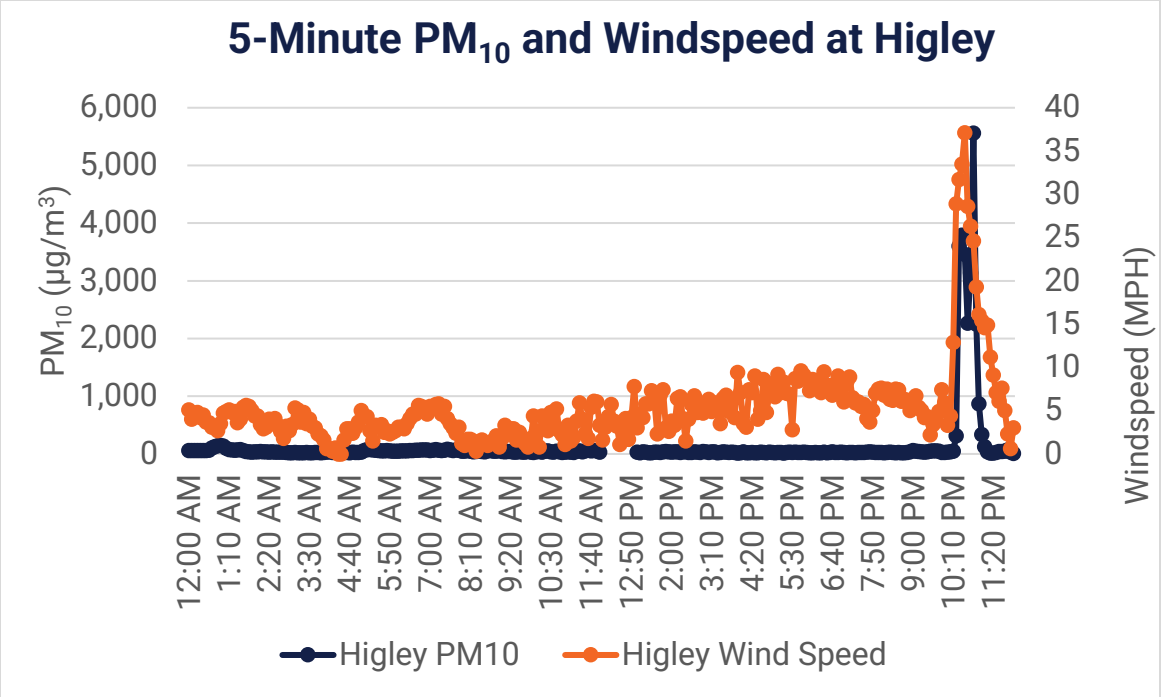


Figure 5: 5-MinutePM_{10} concentrations (µg/m^3) and windspeed (mph) at Higley monitoring station on July 9th, 2021.

Figures 4 and **5** show that as windspeeds increased on July 9th, 2021, at the Higley and West Chandler stations, 5-Minute PM_{10} concentrations rose relatively as well to over 2,000 µg/m^3, indicating dust storm activity[11]. 5-Minute windspeeds at West Chandler and Higley are greater than 25 mph, peaking around 37 mph at 10:10 PM. At the peak of these high winds PM_{10} concentrations were the highest, with 24-hour average concentrations being recorded as 165 µg/m^3 at West Chandler and 130 µg/m^3 at Higley[12], and at 10:00 P.M. West Chandler's PM_{10} concentration exceeded NAAQS.

An evaluation of all air quality inspections and complaints between July 6th, 2021, and July 12th, 2021, indicates no evidence of unusual anthropogenic PM_{10} emissions. During the 6-day period, 23 air quality related events were received, with 22 related to windblown dust or PM_{10}. For more details on these complaints, please review **Appendix A**.

Blowing dust haze, and dust storms along with reduced visibilities were reported on July 9th, 2021, throughout the Phoenix area. The pictures below show ADEQ's Visibility Camera Historical Archive photos of the Phoenix area at the time prior to and during the dust storm on July 9th, 2021. The pictures on the left show the area prior to the storm, and the pictures on the right show the area with reduced visibility during the storm. Note the storm hit the Phoenix area around 10:00 P.M.

[11] Maricopa County Air Quality Department, *Maricopa County Air Quality Status Map – 1-Hour PM_{10} and Windspeed Historical Data for West Chandler and Higley Monitoring Stations*, July 9th, 2021. Accessed August 16th, 2023. https://maricopaco.agilaire.com/AirVision/

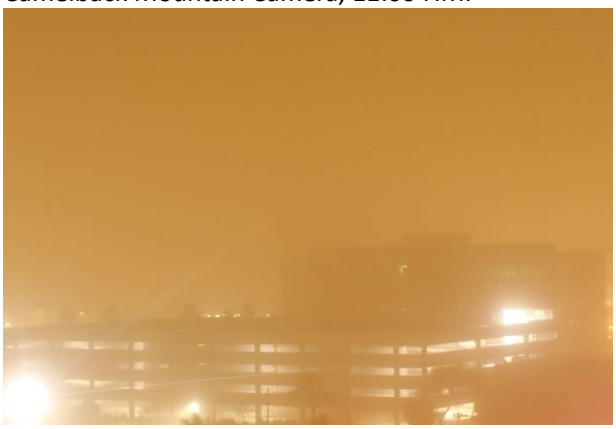
[12] Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division, *Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021*, July 9th, 2021, Atypical Event, **Table 10**, **Page 37**. Accessed August 17th, 2023.

South Mountain Camera, 10:30 P.M.

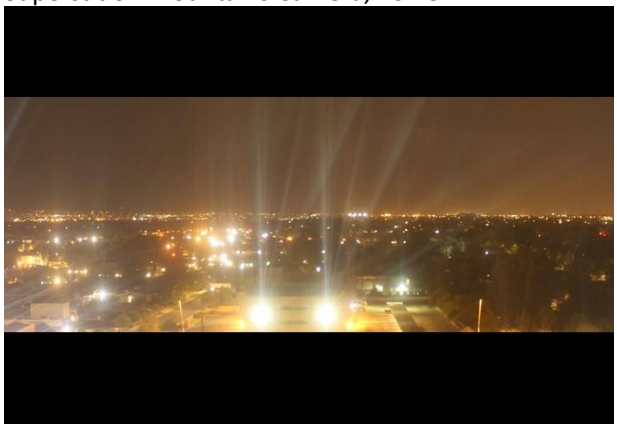
South Mountain Camera, 11:15 P.M.

Camelback Mountain Camera, 10:00 P.M.

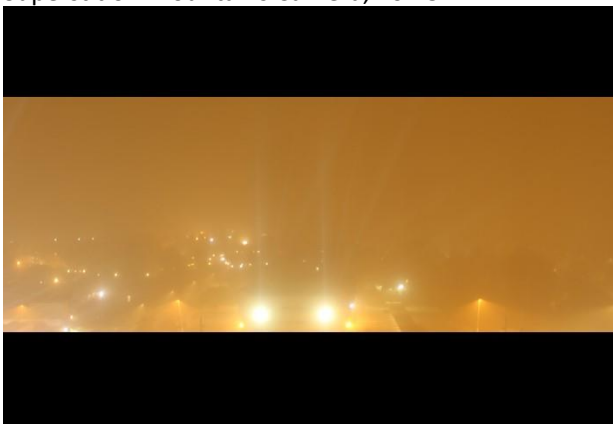
Camelback Mountain Camera, 11:00 P.M.



Superstition Mountains Camera, 10:15 P.M.



Superstition Mountains Camera, 10:45 P.M.



October 11th, 2021, Atypical Event

A high-wind event from monsoon storm activity occurred on October 11th, 2021, causing widespread blowing dust throughout Arizona. Wind gusts were recorded to reach up to 46 mph at the NOAA Phoenix Airport Weather Station (**Table 7**) Five monitoring sites in both Maricopa and Pinal counties, including West Chandler, exceeded the 24-hour PM_{10} NAAQS. For more details on all monitoring sites besides West Chandler that exceeded the 24-hour PM_{10} NAAQS during this atypical event date, please refer to **Appendix A.**

According to the ADEQ pollution forecast for October 11th and 12th, two strong low-pressure fronts hit the Southwest United States region. The first low pressure front resulted in breezy westerly winds and potential pockets of dust on October 9th and 10th, and the second low pressure front on October 11th brought stronger southwestern winds with elevated PM_{10} levels due to a combination of fall seasonally dependent high winds and PM_{10} concentration volatility. On October 11th, 2021, the NWS Phoenix Area Forecast Discussion reported that a low-pressure front had advanced southward through the Sierra Nevada and Central California. In response to this tightening low-pressure gradient, winds intensified. Satellite imagery confirmed the presence of blowing dust near the Salton Sea. This blowing dust propagated eastward into the Phoenix area during the evening of October 11th, 2021. Consequently, a Blowing Dust Advisory was issued for the lower desert areas of Arizona[13]. On October 12th around 12:00 A.M., due to strong winds and cooler temperatures because of October 11th's low-pressure front and westerly winds, PM_{10} levels rose again significantly. On October 11th and 12th, 2021, PM_{10} levels exceeded health standards and resulted in a High Pollution Advisory for PM_{10} in the Phoenix area being placed on October 12th, 2021[14].

With winds over 25 mph throughout the Phoenix area and due to meteorological conditions and a high wind event, high PM_{10} concentrations occurred on October 11th and 12th, 2021. The majority of the elevated PM_{10} concentrations occurred between October 11th, 2021, and 9:00 P.M. and October 12th, 2021, at 3:00 A.M. However, October 11th is the day being analyzed for atypical event consideration, as the initial low-pressure front causing high winds, blowing dust, and PM_{10} exceedances initiated on October 11th, 2021.

Table 7 shows the windspeed levels and highest PM_{10} concentrations recorded for October 11th, 2021, at the West Chandler and Higley Stations.

Table 7: Windspeed and PM_{10} Data for October 11th, 2021

Site	Date	24-hour average PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Windspeed (MPH)	Time	Max Wind Gust (MPH)	Time
West Chandler	10/11/2021	160*	19.9	9:00 P.M.	45.6	10:00 P.M.
Higley	10/11/2021	134	18.4	7:00 P.M.	36.2	7:00 P.M.

Source: Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division, *Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021*, July 9th, 2021, Atypical Event, **Table 12, Page 45**.
Notes: *Measurement exceeds PM_{10} NAAQS.

[14] Valley Metro, *High Pollution Advisory Dates*, 2021. Accessed August 17th, 2023. https://www.valleymetro.org/commute-solutions/high-pollution-advisory

High winds, with max hourly windspeeds slightly less than 25 mph, were recorded at West Chandler and Higley on October 11th, 2021. Throughout the Phoenix area, wind gusts over 25 mph were recorded and five PM monitors including West Chandler recorded PM_{10} concentrations over NAAQS thresholds. For more details on these five monitors besides West Chandler please refer to **Appendix A**. The West Chandler and Higley stations both recorded wind gust speeds surpassing 25 mph at a maximum of 45.6 mph at West Chandler and 36.2 mph at Higley15. Per NOAA Phoenix Sky Harbor Airport Weather Station data, the highest windspeed recorded for October 11th, 2021, was 28 mph at 10:44 P.M. Increased PM_{10} concentrations observed on October 11th, 2021, coincided with these high wind conditions (maximum wind gust speeds over 45 mph at West Chandler Station) in the project area as shown in **Figures 6** and **7** below (referenced from MCAQD's Atypical Events Report, Appendix A).

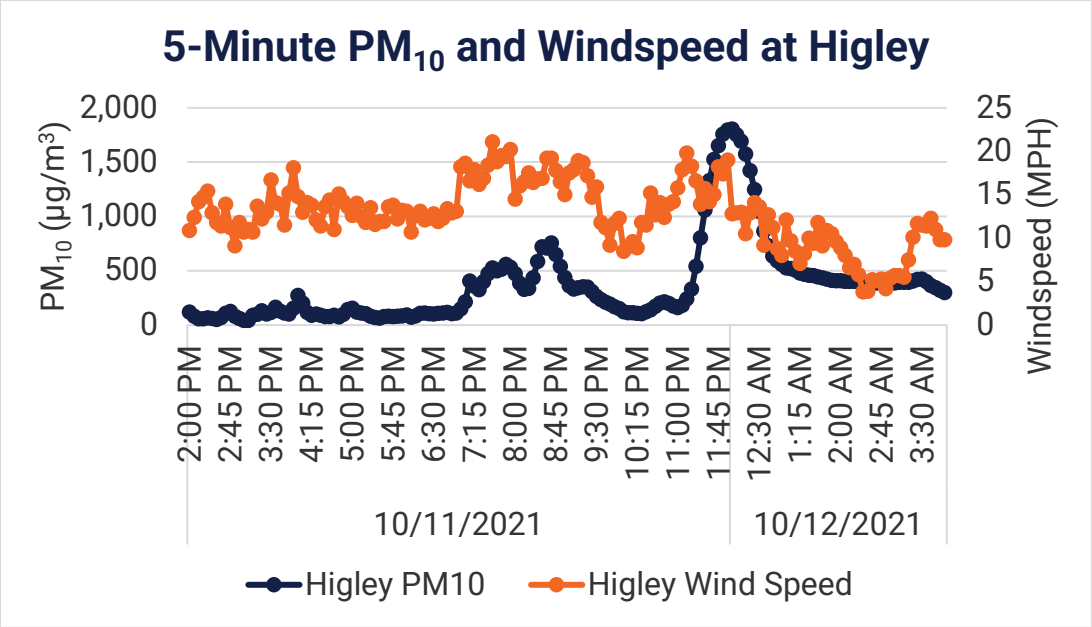


Figure 6: 5-Minute PM_{10} concentrations ($\mu g/m^3$) and windspeed (mph) at Higley monitoring station on October 11th and 12th, 2021.

[15] Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division, *Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021,* July 9th, 2021, Atypical Event, **Table 12, Page 45**. Accessed September 18th, 2023.

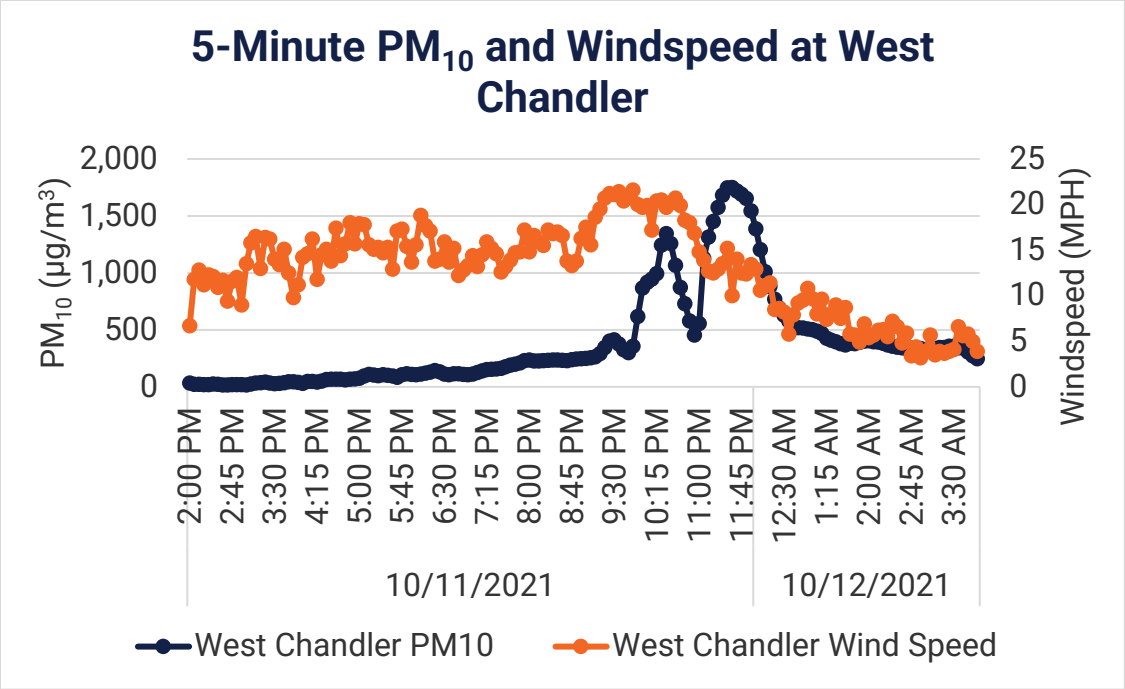


Figure 7: 5-Minute PM_{10} concentrations ($\mu g/m^3$) and windspeed (mph) at West Chandler monitoring station on October 11th and 12th, 2021.

Figures 6 and **7** illustrate high windspeeds at the Higley and West Chandler monitoring stations on October 11th, 2021, with sustained high windspeeds increasing as the storm progressed. Coinciding with the peak windspeeds, beginning around 7:00 P.M. on October 11th and extending to 12:00 A.M. on October 12th, 2021, 5-minute PM_{10} concentrations notably rose to greater than 1,000 $\mu g/m^3$ at both the Higley and West Chandler monitoring stations indicating dust storm activity. As a result, the West Chandler monitoring station exceeded PM_{10} NAAQS on both October 11th and 12th. The Higley monitoring station did not go over PM_{10} NAAQS thresholds on October 11th, 2021, but did exceed 3 hours later (24-hour average of 219 $\mu g/m^3$) at 12:00 A.M. on October 12th, 2021[16].

An evaluation of all air quality inspections and complaints between October 8th, 2021, and October 12th, 2021, indicates no evidence of unusual anthropogenic PM_{10} emissions. During the 4-day period, 25 air quality related events were received, with 17 related to windblow dust or PM_{10}. For more details on these complaints, please refer to **Appendix A**.

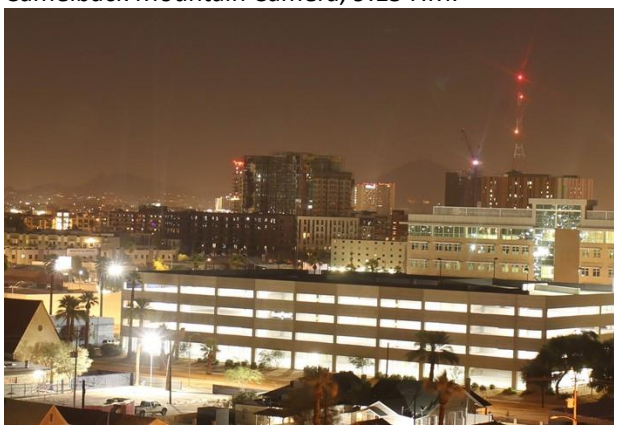
Blowing dust, haze, and dust storms along with reduced visibilities were reported on October 11th, 2021, in the Phoenix area. The pictures below show ADEQ's Visibility Camera Historical Archive photos of the Phoenix area at the time prior to and during the dust storm with reduced visibility on October 11th, 2021. Note the first low pressure wave of the storm hit the Phoenix area around 9:00 P.M.

[16] Maricopa County Air Quality Departments (MCAQD) Air Quality Planning & Analysis Division, *Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021,* July 9th, 2021, Atypical Event, **Table 12, Page 45**. Accessed September 18th, 2023.

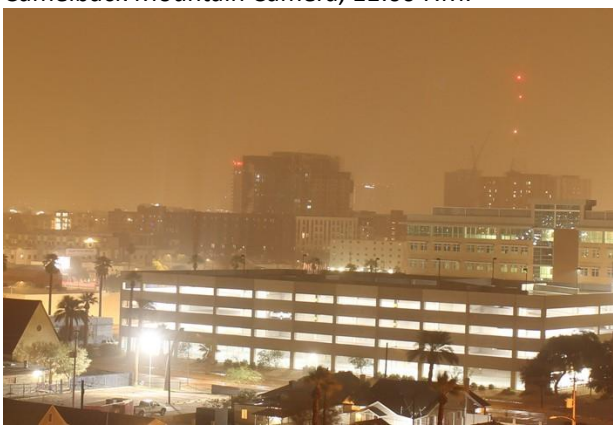
South Mountain Camera, 4:30 P.M.

Note: There are no images available in the archive for South Mountain camera after 4:30 P.M. on October 11, 2021

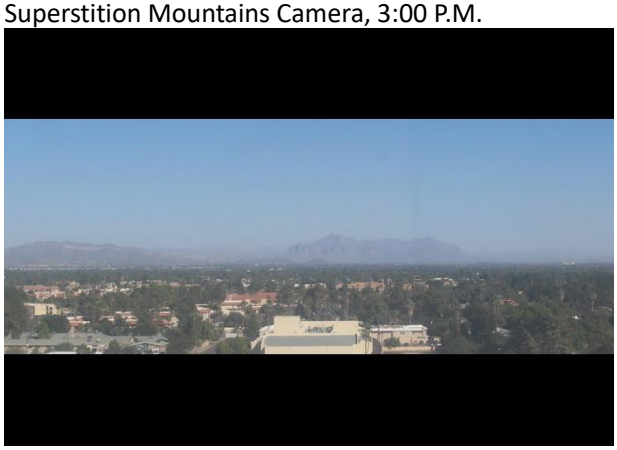
Camelback Mountain Camera, 9:15 P.M.



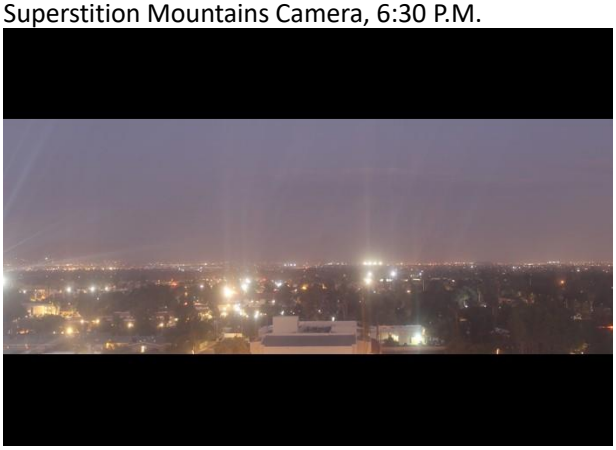
Camelback Mountain Camera, 11:00 P.M.



Superstition Mountains Camera, 3:00 P.M.



Superstition Mountains Camera, 6:30 P.M.



Note: There are no images available in the archive for Superstion Mountains Camera after 6:30 P.M.on October 11, 2021

5.0 Project PM_{10} Background Concentrations, Removing Atypical Events

In summary, three days are being proposed to be excluded from the project's background concentration analysis excluded because they were flagged by MCAQD as having been affected by an atypical air quality event. These days were removed from the original West Chandler and Higley 2019 through 2021 PM_{10} data set due to the atypical-type nature of the local conditions when the high PM_{10} values were observed (e.g., windblown dust, high winds, haze). Once removed, the remaining data was used to calculate a PM_{10} background concentration of 93.2 µg/m^3. Please note that the days being considered for removal in this report are distinct from those detailed in MCAQD's Atypical Events Report. Additionally, the PM_{10} analysis for this project encompasses data from 2019 to 2021, while MCAQD's report provides data from 2020 to 2021. Consequently, the 4th highest PM_{10} concentration in this report is more conservative than the one in MCAQD's Atypical Events Report and should be regarded as the project's proposed adjusted PM_{10} background concentration. **Table 8** shows the West Chandler and Higley monitoring station data's 4 highest PM_{10} readings, after removing atypical event data.

Table 8: Project Monitoring station Highest 24-hour PM10 Readings, Removing Atypical Events

West Chandler Station			
Data Year	**2019**	**2020**	**2021**
Number of Readings	365	362	361
1st	76	263	181
2nd	71	89	122
3rd	67	80	89*
4th	66	74	76
Higley Station			
Data Year	**2019**	**2020**	**2021**
Number of Readings	365	364	354
1st	114*	131	219
2nd	91	107	116
3rd	91	106	108
4th	89	92	93

Source: U.S. EPA Outdoor Air Quality Data, Download Daily Air Quality Data, https://www.epa.gov/outdoor-air-quality-data/download-daily-data
Note: *4th highest 24-hour readings are highlighted in red, removing atypical events.

Table8 shows that with removing atypical events, the West Chandler monitor's 4th highest value over three years (2019-2021) is 89 µg/m^3. This comes from the 4th highest reading out of a total of 1088 days of sampling. For the Higley monitor, over the same three-year period, the 4th highest value is 114 µg/m3 from 1083 days of sampling. Both stations are under the PM_{10} NAAQS threshold.

The predicted background concentration, removing data for atypical events, of the project is:

$$0.83 \times 89 + 0.17 \times 114 = \mathbf{93.2}\ \mu g/m^3$$

Per 40 CFR 50, Appendix K, the Maricopa County NAAQS threshold for PM_{10} 24-hour average concentration threshold is 150 ug/m3. As such, the predicted background concentration when removing atypical event data does not exceed the NAAQs threshold. **Table 9** compares the background concentration, once removing the three atypical events, to the PM_{10} NAAQS threshold.

Table 9: PM_{10} NAAQS Thresholds and Projects Calculated Background PM_{10} Concentrations			
West Chandler Station			
4th Highest 24-hour Average Concentration with Atypical Event Data Exclusion (µg/ m^3)	PM_{10} National Ambient Air Quality Standards (NAAQS)	Difference (µg/m^3)	Exceeds Threshold?
89	150	61	No
Higley Station			
4th Highest 24-hour Average Concentration with Atypical Event Data Exclusion (µg/m^3)	PM_{10} National Ambient Air Quality Standards (NAAQS)	Difference (µg/ m^3)	Exceeds Threshold?
114	150	36	No
Project Background Concentration Levels			
Background Concentration with Atypical Event Data Exclusion (µg/m^3)	PM_{10} National Ambient Air Quality Standards (NAAQS)	Difference (µg/ m^3)	Exceeds Threshold?
93.2	150	56.8	No

Days in which an atypical event, i.e., a dust storm or high wind event, occurred in the region and impacting Higley or West Chandler PM monitoring stations and the project area have been identified. Because regional atypical events were occurring on these days, it is inappropriate to consider these days when calculating background PM_{10} concentrations for the projects hot spot analyses. Finally, after removing days in which an atypical event occurred, the 24-hour PM_{10} background concentration identified for 2019 through 2021 is 93.2 µg/m^3. This concentration is suitable for use as a reasonable background concentration for the project site, as it is more representative of typical background concentrations for the project site excluding atypical events.

Appendix A: Maricopa County Air Quality Department Planning & Analysis Division - Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021

September 2023

Atypical Event Identification at Higley and West Chandler Sites for 2020 and 2021

Maricopa County
Air Quality Department
Planning & Analysis Division

Table of Contents

Summary

This report examines the days in 2020 and 2021 which had the highest 24-hour average concentrations of particulate matter less than 10 microns in diameter (PM_{10}) at the Higley and West Chandler air monitoring sites. Days in which atypical events, i.e., dust storms, were occurring in the region and impacting Higley or West Chandler are identified. Because regional atypical events were occurring on these days, it is inappropriate to consider these days when calculating background PM_{10} concentrations for hot spot analyses.

Information regarding each atypical event includes:

- Air pollution forecasts issued by the Arizona Department of Environmental Quality (ADEQ)
- National Weather Service's (NWS) historical Area Forecast Discussions (AFD)
- An analysis of hourly averaged and maximum gust wind speed at the monitoring site
- 24-hour average PM_{10} concentrations at air monitors in the region
- Wind and pollution roses for the Higley and West Chandler sites
- A six-hour Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) back-trajectory analysis
- List of the nearest and farthest PM_{10} exceeding site from the Higley and West Chandler sites
- The $PM_{10}/PM_{2.5}$ ratio and coarse particulate matter (PM_c) concentrations in the region
- Visibility pictures for the region. These pictures come from the ADEQ's visibility network cameras. Cameras used for this report were:
    - South Mountain—The view is from North Mountain looking toward the Phoenix downtown skyline with the South Mountains in the distance.
    - Camelback— The view is from the Capital Mall area of downtown Phoenix looking northeast toward Camelback Mountain.
    - Superstition Mountain— The view is looking east from downtown Mesa with the community of Apache Junction between the camera and the mountain vista.
- Information about facility inspections and dust citizen complaint responses, and any associated enforcement actions, in the vicinity of the Higley and West Chandler sites
- The Appendix includes charts of 5-minute and hourly PM_{10} and wind data for the Higley and West Chandler sites, as well as any sites that exceeded the 24-hour PM_{10} National Ambient Air Quality Standards (NAAQS) for all events listed in this report

Finally, after removing days in which an atypical event occurred, the fourth highest 24-hour PM_{10} concentration is identified for the period of 2020 through 2021 (see Table 2 and Table 3). This concentration is suitable for use as a reasonable background concentration for the site.

The fourth highest PM_{10} concentrations identified by this report for each site are:

- Higley: 94.0 $\mu g/m^3$ on August 6, 2021
- West Chandler: 80.8 $\mu g/m^3$ on August 11, 2020

PM_{10} Air Monitoring Sites

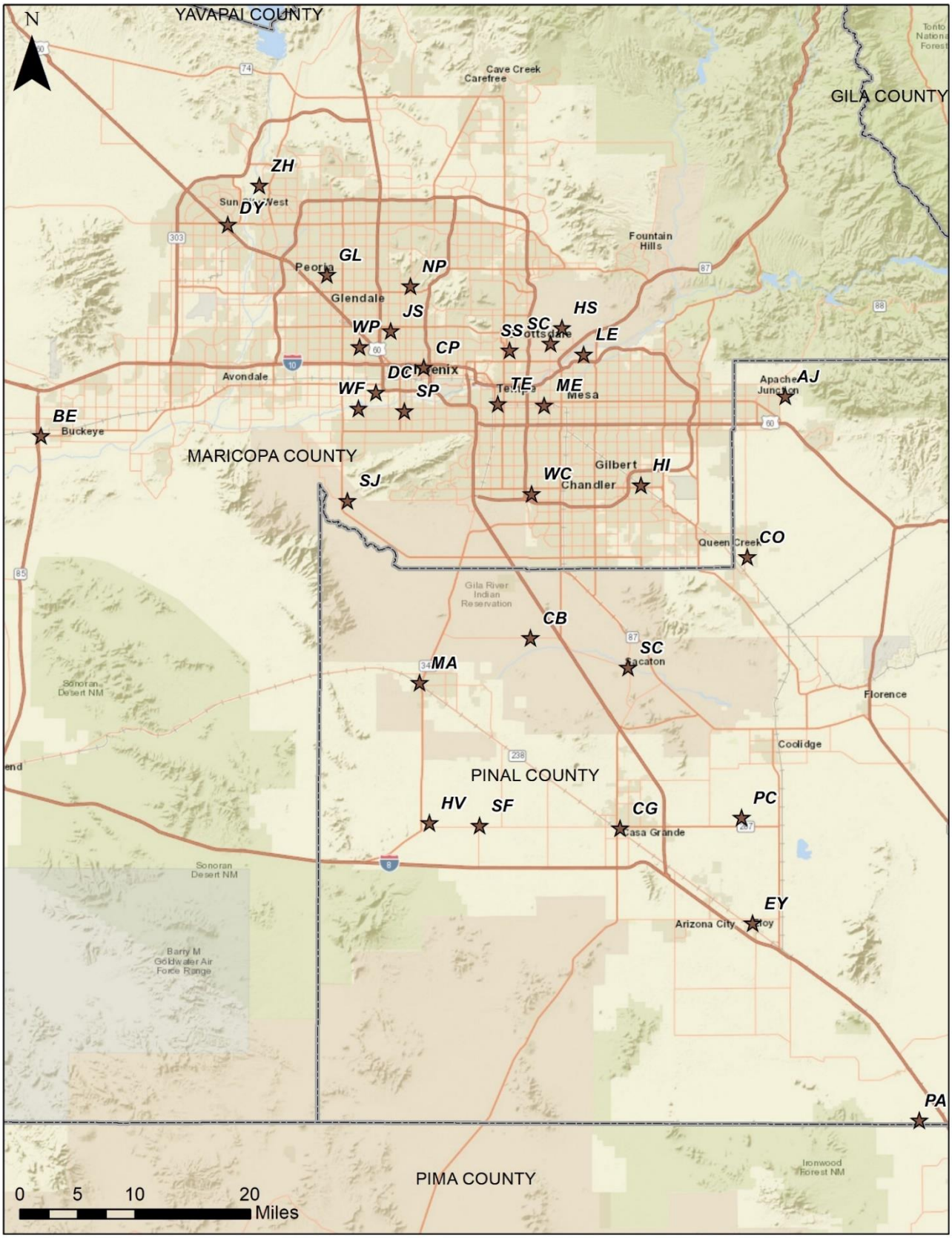
Table 1 lists the PM air monitoring sites that were operating in 2020 and 2021 within Maricopa and Pinal counties. Information on which agency operated the site, the type of PM monitoring instruments at the site (i.e., PM_{10} or $PM_{2.5}$), and the availability of site wind data in the U.S. Environmental Protection Agency (EPA) Air Quality System (AQS) database is listed. Figure 1 is a map of the region which shows the locations of these sites. Agencies operating monitoring sites include ADEQ, Gila River Indian Community (GRIC), Maricopa County Air Quality Department (MCAQD), Pinal County Air Quality Department (PCAQD), and Salt River Pima-Maricopa Indian Community (SRPMIC).

Table 1. PM monitoring sites in Maricopa and Pinal counties.

AQS Number	Local Site Name	Site Acronym	Agency	PM Monitoring Instruments	Wind Data (In AQS)
04-013-0019	West Phoenix	WP	MCAQD	PM_{10}, $PM_{2.5}$	Speed/Direction
04-013-1003	Mesa	ME	MCAQD	PM_{10}, $PM_{2.5}$	Speed/Direction
04-013-1004	North Phoenix	NP	MCAQD	PM_{10}, $PM_{2.5}$	Speed/Direction
04-013-2001	Glendale	GL	MCAQD	PM_{10}, $PM_{2.5}$	Speed/Direction
04-013-3002	Central Phoenix	CP	MCAQD	PM_{10}	Speed/Direction
04-013-3003	South Scottsdale	SS	MCAQD	PM_{10}	Speed/Direction
04-013-4003	South Phoenix	SP	MCAQD	PM_{10}, $PM_{2.5}$	Speed/Direction
04-013-4004	West Chandler	WC	MCAQD	PM_{10}	Speed/Direction
04-013-4005	Tempe	TE	MCAQD	PM_{10}, $PM_{2.5}$	Speed/Direction
04-013-4006	Higley	HI	MCAQD	PM_{10}	Speed/Direction
04-013-4009	West 43rd Avenue	WF	MCAQD	PM_{10}	Speed/Direction
04-013-4010	Dysart	DY	MCAQD	PM_{10}	Speed/Direction
04-013-4011	Buckeye	BE	MCAQD	PM_{10}	Speed/Direction
04-013-4016	Zuni Hills	ZH	MCAQD	PM_{10}	Speed/Direction

AQS Number	Local Site Name	Site Acronym	Agency	PM Monitoring Instruments	Wind Data (In AQS)
04-013-7003	St Johns	SJ	GRIC	PM_{10}	
04-013-7020	Senior Center	SC	SRPMIC	PM_{10}, $PM_{2.5}$	
04-013-7022	Lehi	LE	SRPMIC	PM_{10}	
04-013-7024	High School	HS	SRPMIC	PM_{10}	
04-013-9812	Durango Complex	DC	MCAQD	PM_{10}, $PM_{2.5}$	Speed/Direction
04-013-9997	JLG Supersite	JS	ADEQ	PM_{10}, $PM_{2.5}$	Speed/Direction
04-021-0001	Casa Grande Downtown	CG	PCAQD	PM_{10}, $PM_{2.5}$	
04-021-3002	AJ Fire Station	AJ	PCAQD	PM_{10}, $PM_{2.5}$	
04-021-3007	Pinal Air Park	PA	PCAQD	PM_{10}	
04-021-3008	Stanfield	SF	PCAQD	PM_{10}	
04-021-3009	Combs	CO	PCAQD	PM_{10}	
04-021-3011	Pinal County Housing	PC	PCAQD	PM_{10}	
04-021-3014	Eloy	EY	PCAQD	PM_{10}	
04-021-3015	Hidden Valley	HV	PCAQD	PM_{10}, $PM_{2.5}$	
04-021-3016	Maricopa 1405	MA	PCAQD	PM_{10}	
04-021-7001	Sacaton	SC	GRIC	PM_{10}	
04-021-7004	Casa Blanca	CB	GRIC	PM_{10}	

Figure 1. PM monitoring sites in Maricopa and Pinal counties. Acronyms for site names are listed in Table 1.



Compliance and Enforcement Summary

MCAQD is prepared to proactively respond to high wind events and protect human health and well-being. MCAQD's approach consists of two primary components: routine proactive inspections, as well as surveillance inspections, conducted both during and after significant events. MCAQD routinely inspects sites operating under dust control permits, and sites permitted to disturb more than ten acres are inspected more frequently. Nonmetallic mineral processing facilities, which are subject to Rule 316 (Nonmetallic Mineral Processing), are inspected five times every year. Maricopa County also responds to the majority of citizen complaints about air quality within 24 hours.

MCAQD monitors the ADEQ Dust Control Forecast to identify the potential for elevated PM_{10} pollution levels due to high winds or stagnant conditions. When a High Pollution Advisory (HPA) is issued for Maricopa County, MCAQD conducts additional increased surveillance before, during, and after the forecast event(s). MCAQD also conducts event surveillance and post-event activities after an exceptional event that had not been forecast (i.e., those instances in which an HPA had not been issued).

Pre-event surveillance consists of surveying high-risk areas for any dust-generating activities, educating sources of the impending HPA event, and issuing violations for failure to comply with local, state, or federal regulations. During the event, MCAQD inspectors survey high-risk areas to confirm that control measures are in place, document any violations, and contact other regulatory agencies if necessary. Post-event activities include continued surveys of high-risk areas, re-inspecting sources within two business days of receiving a violation, and an internal MCAQD debriefing of event activities.

Currently, a total of 15 MCAQD air monitoring sites are equipped to allow the automatic reporting of monitored readings at 5-minute intervals. The real-time data reporting system includes a mechanism to alert MCAQD inspectors when PM_{10} concentrations are elevated. The system allows MCAQD inspectors to review concentrations at the monitor and to consult the National Weather Service website to check for weather event activity. This capability allows the MCAQD responder to identify regional events and monitor specific issues. If necessary, the MCAQD responders can inform nearby stakeholders and local governments of the elevated PM_{10} concentrations.

A summary of inspection and enforcement activity is provided for each atypical event day listed in this report. This summary will cover a period three days before and three days after the atypical event day. If any enforcement activity during this seven-day period occurred within a four-mile radius of the Higley or West Chandler monitoring sites, that will be noted. Complaint activity, inspections, and findings will also be listed for this seven-day period. Any complaints focused on an area within four miles of the Higley or West Chandler monitoring sites will be described in greater detail.

Higley Atypical Events

Table 2. Identification of the ten highest 24-hour average PM_{10} concentrations at the Higley air monitoring site in 2020 and 2021.

Date	24-hour Average PM_{10} Concentration ($\mu g/m^3$)	Number of Sites in Maricopa and Pinal Counties Exceeding PM_{10} NAAQS	PM_{10} NAAQS Exceedances flagged as an Exceptional Event	Identified as an Atypical Event	Nearest Exceeding Site (from Higley)	Farthest Exceeding Site (from Higley)
10/12/2021	219.8	22	✓	✓	West Chandler (9.5 miles away)	Pinal Air Park (60 miles away)
03/03/2021	208.0	8	✓	✓	Casa Blanca (16 miles away)	Eloy (39.2 miles away)
10/11/2021	134.7	5	✓	✓	West Chandler (9.5 miles away)	Buckeye (52.3 miles away)
08/16/2020	131.5	11	✓	✓	West Chandler (9.5 miles away)	Eloy (39.2 miles away)
07/09/2021	131.2	5	✓	✓	West Chandler (9.5 miles away)	St. Johns (25.5 miles away)
04/21/2021	117.1	3	✓	✓	Pinal County Housing (30.1 miles away)	Eloy (39.2 miles away)
07/22/2021	108.5	0				
09/29/2020	107.6	0				
08/11/2020	107.3	1	✓		Stanfield (32.7 miles away)	Stanfield (32.7 miles away)
8/06/2021	94.0	0				

West Chandler Atypical Events

Table 3. Identification of the ten highest 24-hour average PM_{10} concentrations at the West Chandler air monitoring site in 2020 and 2021.

Date	24-hour Average PM_{10} Concentration ($\mu g/m^3$)	Number of Sites in Maricopa and Pinal Counties Exceeding PM_{10} NAAQS	PM_{10} NAAQS Exceedances flagged as an Exceptional Event	Identified as an Atypical Event	Nearest Exceeding Site (from West Chandler)	Farthest Exceeding Site (from West Chandler)
08/16/2020	263.9	11	✓	✓	Casa Blanca (12.5 miles away)	Eloy (42 miles away)
10/12/2021	181.5	22	✓	✓	Mesa (7.8 miles away)	Pinal Air Park (64 miles away)
07/09/2021	166.4	5	✓	✓	Mesa (7.8 miles away)	St. Johns (16 miles away)
10/11/2021	160.9	5	✓	✓	Casa Blanca (12.5 miles away)	Buckeye (43 miles away)
03/03/2021	154.3	8	✓	✓	Casa Blanca (12.5 miles away)	Eloy (42 miles away)
07/22/2021	122.5	0				
09/29/2020	89.9	0				
07/13/2021	89.6	0				
08/11/2020	80.8	1	✓		Stanfield (29 miles away)	Stanfield (29 miles away)
11/19/2021	76.8	0				

Atypical Event: August 16, 2020

A high-wind event from monsoon storm activity occurred on this date and caused widespread blowing dust throughout the region. Eleven monitoring sites, in both Maricopa and Pinal counties, exceeded the 24-hour PM_{10} NAAQS on this date.

ADEQ Pollution Forecast

Note that ADEQ forecasts are not done on the weekends, so an archived forecast for Sunday, August 16, 2020, is not available. The following selected portion of the forecast was made on Friday, August 14, 2020, and includes anticipated conditions for the weekend.

> "Ozone levels continue to stay in the upper Moderate AQI range and we don't expect a lot of change. We forecast slight improvement over the coming days with better mid-level winds, but nothing significant. PM_{10} may end up being the more interesting story this weekend. The ridge over the region is forecast to push north, which is looking a little more monsoon-like. Right now it looks like there is a chance of thunderstorm outflows to affect the Phoenix area Sunday evening. As a result, we are forecasting blowing dust to move through the area causing elevated PM_{10} concentrations for a few hours Sunday evening. The rest of the forecast period isn't expected to have any major dust issues, just the more typical upper Good/lower Moderate AQI range. $PM_{2.5}$ is forecast to remain in the Good AQI range through the forecast period."

NWS Area Forecast Discussion

The following selected portions of the Area Forecast Discussion are from the National Weather Service office in Phoenix, AZ, for 2:30 p.m. MST Sunday August 16, 2020.

> Synopsis:
>
> "Strong high pressure will remain situated across the southwestern U.S. through at least the middle of the week keeping hot conditions in place. High temperatures across the lower deserts will approach or exceed 115 degrees through at least the middle of the week. Isolated thunderstorms and areas of blowing dust will be possible this afternoon and evening across south-central Arizona. A slightly more favorable monsoon pattern develops as the week progresses. "
>
> Selected portions of the discussion:
>
> "One of the days that does show more promise for significant storms/dust storms into the central deserts will be today. Most of the CAMS as well as HREF guidance depict a rather organized line of convection to move across eastern Arizona and into the central deserts late this afternoon through the evening.

Gusty outflow wind from these storms will likely move into portion of the low desert and the Phoenix area this evening stirring up patchy dense blowing dust."

Environmental Conditions at Air Monitoring Sites

Table 4. PM_{10} and wind data for air monitoring sites in Maricopa and Pinal counties on August 16, 2020.

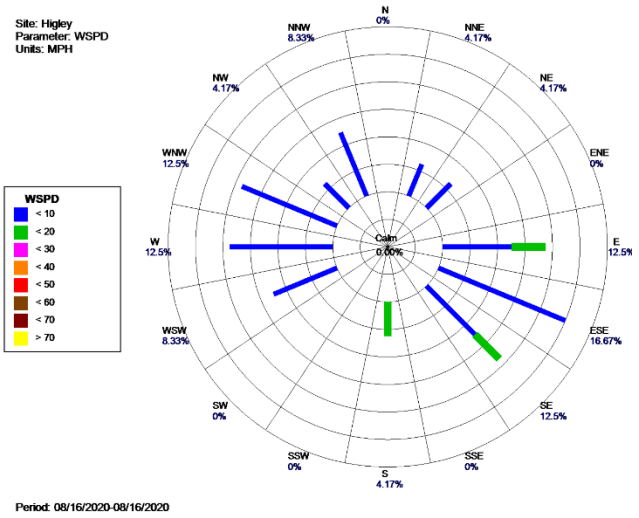
Site	24-hour average PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
West Phoenix	120	7.p2	3:00 p.m.	24.1	6:00 p.m.
Mesa	129	10.2	6:00 p.m.	25.7	12:00 a.m.
North Phoenix	116	5.9	10:00 p.m.	25.5	6:00 p.m.
Glendale	76	9.1	6:00 p.m.	30.2	6:00 p.m.
Central Phoenix	214#	8.0	2:00 p.m.	21.6	3:00 p.m.
South Scottsdale	192#	10.4	12:00 a.m.	27.1	6:00 p.m.
South Phoenix	98	6.6	3:00 p.m.	18.7	3:00 p.m.
West Chandler	263#	13.6	6:00 p.m.	31.6	6:00 p.m.
Tempe	134	7.2	12:00 a.m.	20.4	6:00 p.m.
Higley	131	12.9	6:00 p.m.	31.1	5:00 p.m.
West 43rd Avenue	199#	8.7	3:00 p.m.	23.0	6:00 p.m.
Dysart	136	14.1	6:00 p.m.	48.8	6:00 p.m.
Buckeye	127	10.7	12:00 a.m.	31.3	6:00 p.m.
Zuni Hills	111	14.6	6:00 p.m.	44.9	5:00 p.m.
St Johns	195#	*	*	*	*
Senior Center	168#	*	*	*	*
Lehi	186#	*	*	*	*

Site	24-hour average PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
High School	191#	*	*	*	*
Durango Complex	141	8.9	3:00 p.m.	20.9	2:00 p.m.
JLG Supersite	139	5.1	6:00 p.m.	*	
Casa Grande Downtown	118	*	*	*	*
AJ Fire Station	33	19.6	5:00 p.m.	24.5	5:00 p.m.
Pinal Air Park	58	*	*	*	*
Stanfield	75	17.0	6:00 p.m.	31.9	6:00 p.m.
Combs	90	*	*	*	*
Pinal County Housing	50	27.4	5:00 p.m.	56.8	5:00 p.m.
Eloy	1228#	*	*	*	*
Hidden Valley	97	20.1	6:00 p.m.	45.5	5:00 p.m.
Maricopa 1405	57	*	*	*	*
Sacaton	200#	*	*	*	*
Casa Blanca	221#	*	*	*	*

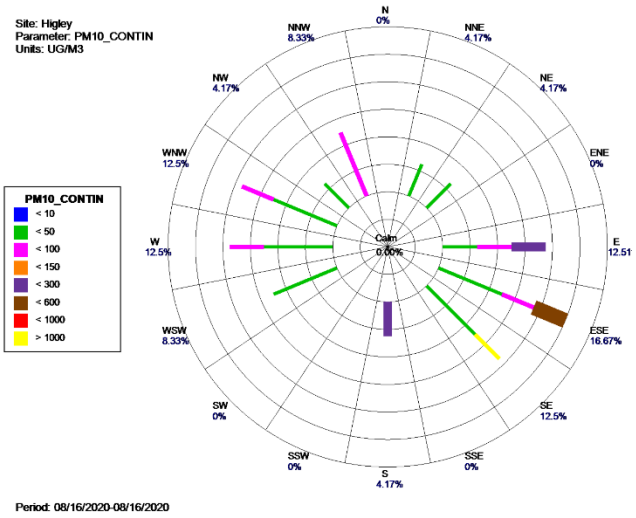
*Not available
#Exceedance of the 24-hour PM_{10} NAAQS

Pollution and Wind Roses for Higley and West Chandler Sites on August 16, 2020

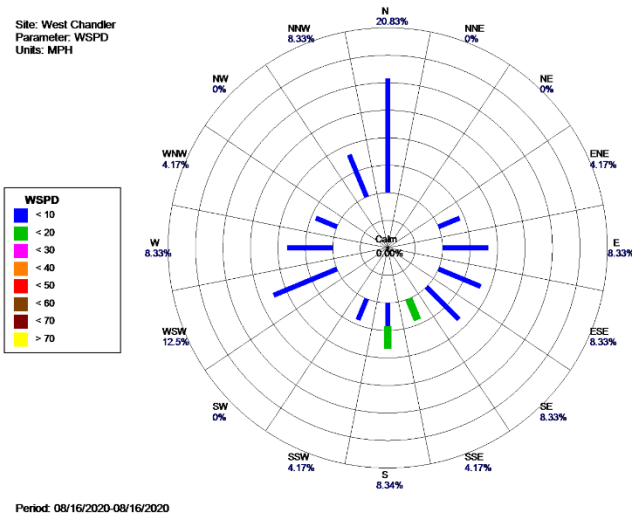
Higley Wind Rose



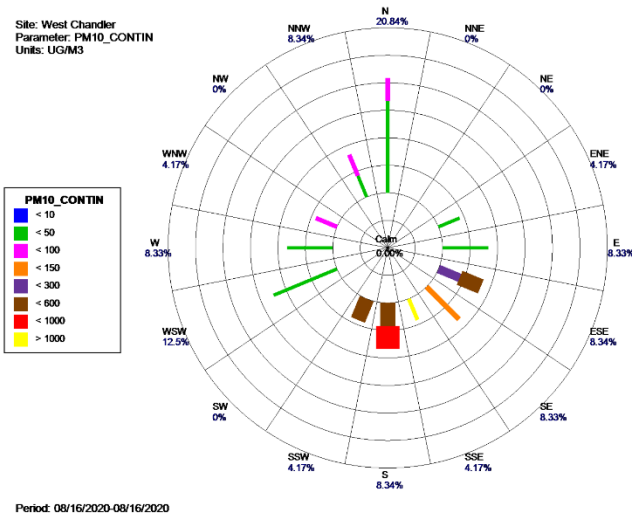
Higley PM_{10} Rose



West Chandler Wind Rose

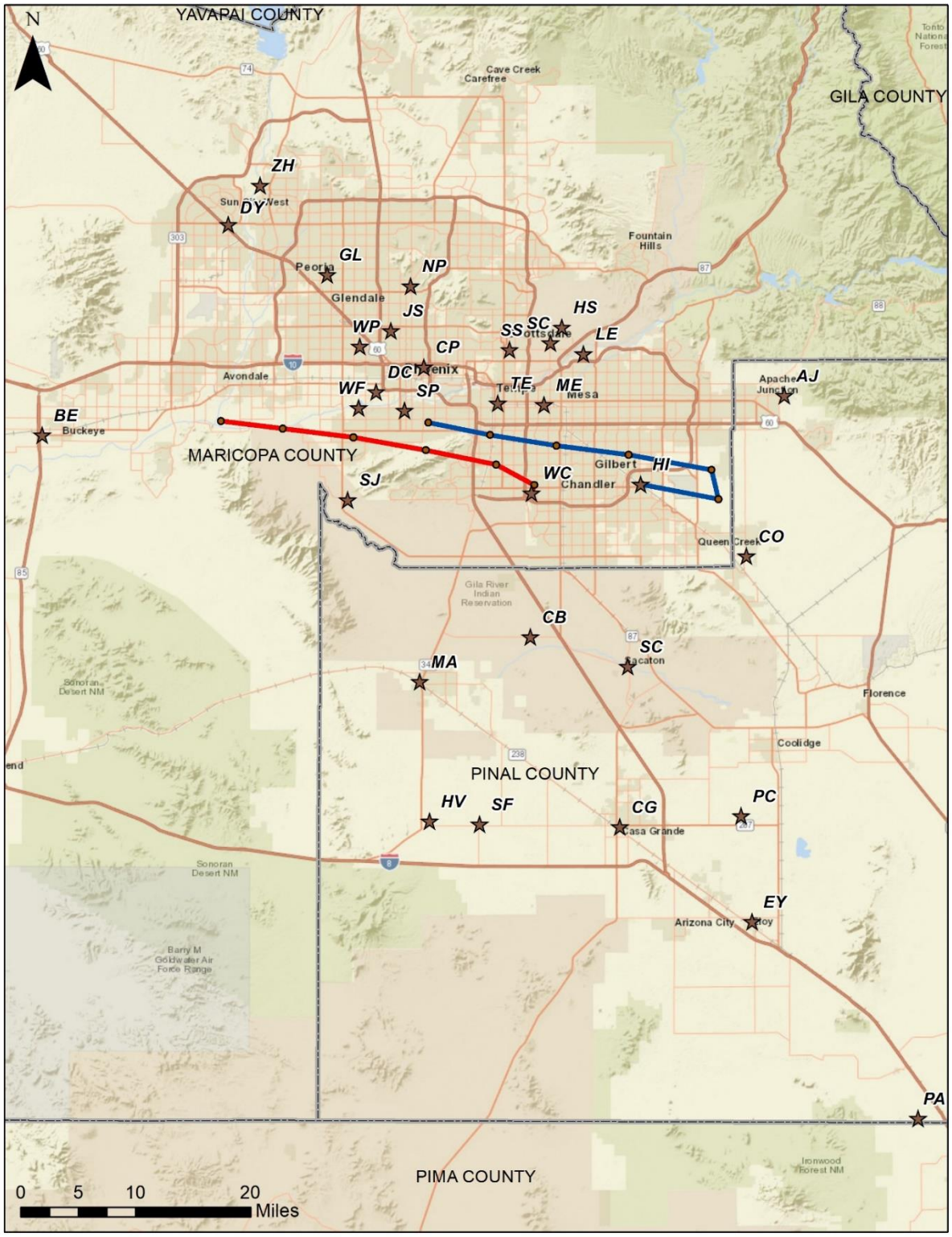


West Chandler PM_{10} Rose



HYSPLIT Back-Trajectory Analyses

Figure 2. HYSPLIT 6-hour back-trajectory ending at 6:00 p.m. on August 16, 2020, at both the Higley and West Chandler sites. Elevation at end time is 100 meters above ground level (m AGL).



Proximity of Other Exceeding Sites to West Chandler and Higley

Note that the Higley monitor did not exceed the 24-hour PM_{10} NAAQS on this date.

- Higley
  - Closest exceeding site: West Chandler (9.5 miles away)
  - Farthest exceeding site: Eloy (39.2 miles away)
- West Chandler
  - Closest exceeding site: Casa Blanca (12.5 miles away)
  - Farthest exceeding site: Eloy (42 miles away)

$PM_{10}/PM_{2.5}$ Ratios for Regional Air Monitors

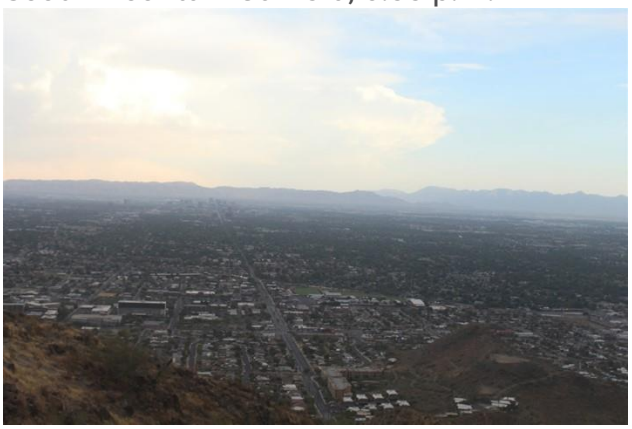
Table 5. Hourly-averaged PM_{10}, $PM_{2.5}$, and PM_C for sites in Maricopa and Pinal counties having a continuous $PM_{2.5}$ monitor. Note that time reflects the hour of highest PM_{10} concentration on August 16, 2020.

Site	Time	PM_{10}	$PM_{2.5}$	PM_C	Ratio $PM_{2.5}/PM_{10}$
West Phoenix	8:00 p.m.	694.0	82.4	611.4	0.12
Mesa	7:00 p.m.	896.3	90.8	805.2	0.10
North Phoenix	8:00 p.m.	624.8	71.2	555.3	0.11
Glendale	11:00 p.m.	233.5	24.3	208.9	0.10
South Phoenix	9:00 p.m.	349.1	33.8	315.2	0.10
Tempe	7:00 p.m.	1332.4	117.9	1215.6	0.09
Durango Complex	7:00 p.m.	1079.8	93.9	985.1	0.09
JLG Supersite	7:00 p.m.	694	80	614	0.12
Casa Grande Downtown	6:00 p.m.	1625	53	1572	0.03
Hidden Valley	8:00 p.m.	564	78	486	0.14

ADEQ Visibility Camera Historical Archive

Archived photos from ADEQ's Visibility Camera Historical Archive for August 16, 2020. The image on the left reflects a time before the dust storm occurred and on the right during or after the storm's passage. The storm hit the Phoenix area at approximately 6:00-7:00 p.m.

South Mountain Camera, 6:00 p.m.

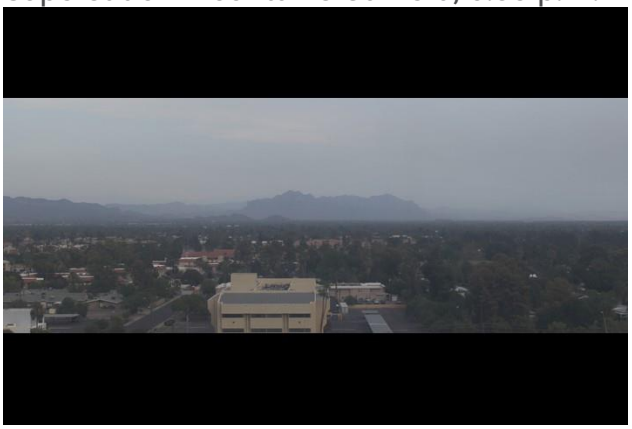


South Mountain Camera, 6:15 p.m.

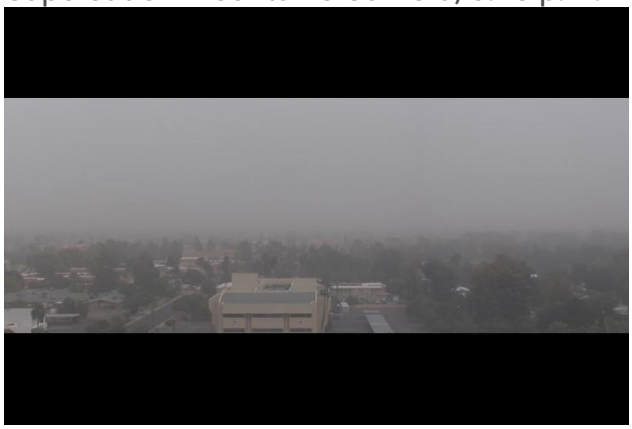
Camelback Mountain Camera, 6:15 p.m.

Camelback Mountain Camera, 6:30 p.m.

Superstition Mountains Camera, 6:30 p.m.



Superstition Mountains Camera, 6:45 p.m.



Compliance and Enforcement Activities

An evaluation of all inspections and air quality complaints indicates no evidence of unusual anthropogenic PM_{10} emissions during the time period of August 13 through 19, 2020.

During this seven-day period the following activity took place:

- Number of inspections of permitted facilities: 112
    - Number of those facilities that were fugitive dust sources: 88
- Number of inspections that resulted in an enforcement action for PM_{10} and non-PM_{10}-related violations: 20
    - Number of enforcement actions that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 0
- Number of complaints received: 40
    - Number of those complaints that were windblown dust or PM_{10} related: 28
    - Number of those complaints that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 2
    - Details on complaints within four-mile radius: One complaint was regarding leaf-blowing activity and the other was regarding dirt roads. No violations were noted during complaint responses.

Atypical Event: March 3, 2021

A high-wind event due to a low-pressure system moving through the state occurred on this date. This caused widespread blowing dust throughout the region. Nine monitoring sites, in both Maricopa and Pinal counties, exceeded the 24-hour PM_{10} NAAQS due to this storm.

ADEQ Pollution Forecast

The following selected portion of the ADEQ forecast was made for Wednesday March 3, 2021.

> "The low-pressure system we've been discussing all week will be arriving in our region this afternoon. Winds between 20 and 30 mph are in the forecast, with even higher gusts possible. The possible chance of precipitation associated with this system will take place in the overnight hours into tomorrow morning. Parts of the valley could see a few sprinkles but nothing very exciting. With the warm temperatures, recent dry conditions, and high winds, the National Weather Service has issued a Red Flag Warning in effect from 11 am today to 6 pm tonight."

NWS Area Forecast Discussion

The following selected portions of the Area Forecast Discussion are from the National Weather Service office in Phoenix, AZ, for 1:10 p.m. MST Wednesday March 3, 2021.

> "Meanwhile, further east, the tightening pressure gradient due to the approaching low is increasing the southerly wind flow across the forecast area. The short-term forecast concerns related to this system are for wind and blowing dust potential, fire weather, and a chance of showers or an isolated thunderstorm this evening.
>
> Considering the wind, wind speeds are rapidly increasing as the low-level stable layer has eroded and high winds from aloft are now mixing throughout the depth of the boundary layer. Wind gusts are exceeding 30 mph near Yuma, with 20-30 mph over much of the rest of the forecast area. Wind speeds at 850 hPa are expected to increase to 40-50 kts across the area this afternoon as the cold front approaches. Because this will coincide with peak heating, very efficient mixing will allow for wind gusts to continue to increase the next few hours, which is consistent with the forecast message over the last few days. Accordingly, the wind advisory will remain in effect with widespread wind gusts of 35-40 mph, with a few locations reaching up to 50 mph west of the Phoenix area. Blowing dust is not typically a huge concern this time of year, but with such strong wind speeds isolated corridors of blowing dust will be possible, which may locally lower visibilities wherever it occurs. Some visibility reduction near Yuma has already been noted, with a few observations showing 4-7mi visibilities. Wind speeds are also increasing in southwest Imperial County, where westerly wind gusts will increase to 50-55mph behind the cold front this afternoon."

Environmental Conditions at Air Monitoring Sites

Table 6. PM_{10} and wind data for PM air monitoring sites in Maricopa and Pinal counties on March 3, 2021.

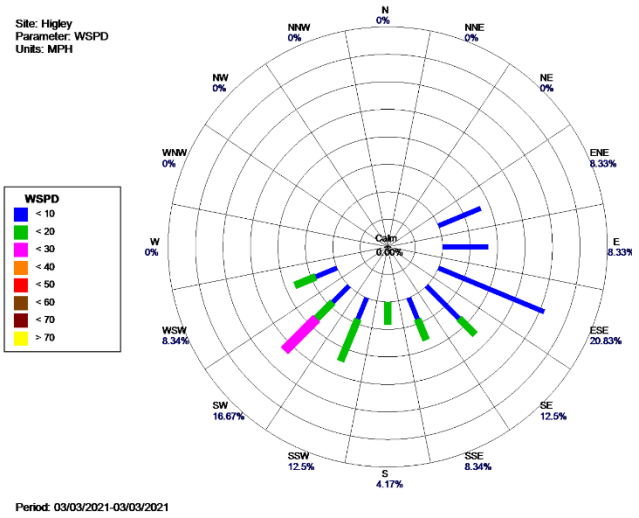
Site	24-hour PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
West Phoenix	ND	18.2	5:00 p.m.	42.1	4:00 p.m.
Mesa	62	19.0	4:00 p.m.	42.5	5:00 p.m.
North Phoenix	43	15.6	3:00 p.m.	41.2	3:00 p.m.
Glendale	ND	25.1	5:00 p.m.	45.6	5:00 p.m.
Central Phoenix	97	19.4	3:00 p.m.	44.3	3:00 p.m.
South Scottsdale	71	19.9	4:00 p.m.	44.8	4:00 p.m.
South Phoenix	58	13.2	4:00 p.m.	35.9	3:00 p.m.
West Chandler	153	20.8	4:00 p.m.	42.9	4:00 p.m.
Tempe	58	16.1	4:00 p.m.	37.6	4:00 p.m.
Higley	207#	22.3	4:00 p.m.	45.3	5:00 p.m.
West 43rd Avenue	177#	18.7	3:00 p.m.	39.0	5:00 p.m.
Dysart	68	20.5	4:00 p.m.	45.8	4:00 p.m.
Buckeye	81	19.1	4:00 p.m.	44.0	4:00 p.m.
Zuni Hills	61	26.0	4:00 p.m.	44.7	4:00 p.m.
St Johns	61	*	*	*	*
Senior Center	133	*	*	*	*
Lehi	84	*	*	*	*
High School	103	*	*	*	*

Site	24-hour PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
Durango Complex	90	15.9	3:00 p.m.	38.8	3:00 p.m.
JLG Supersite	75	18.0	3:00 p.m.	*	*
Casa Grande Downtown	171#	*	*	*	*
AJ Fire Station	89	*	*	*	*
Pinal Air Park	113	*	*	*	*
Stanfield	225#	22.1	4:00 p.m.	42.9	5:00 p.m.
Combs	131	*	*	*	*
Pinal County Housing	169#	26.2	2:00 p.m.	42.7	5:00 p.m.
Eloy	170	*	*	*	*
Hidden Valley	134	*	*	*	*
Maricopa 1405	184#	*	*	*	*
Sacaton	96	*	*	*	*
Casa Blanca	165#	*	*	*	*

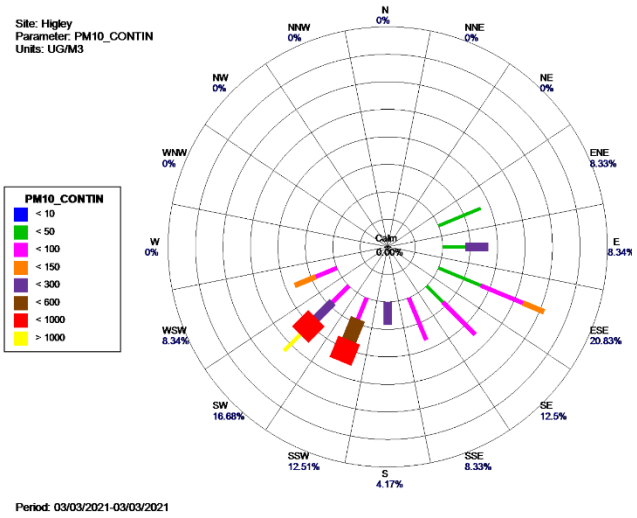
*Not available
#Exceedance of the 24-hour PM_{10} NAAQS
ND: No data available in AQS for this day

Pollution and Wind Roses for Higley and West Chandler Sites on March 3, 2021

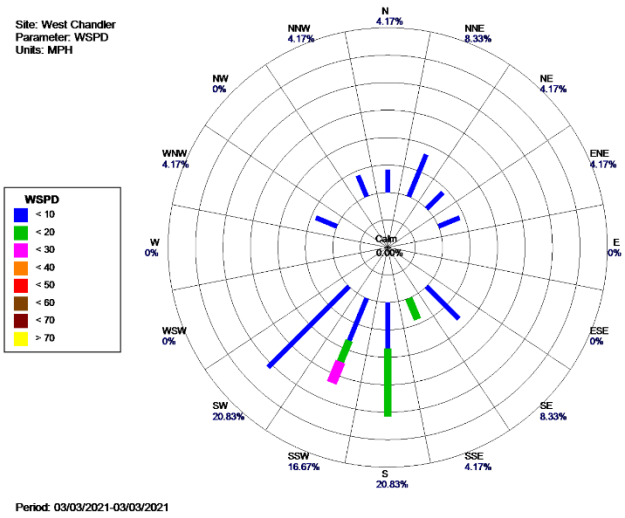
Higley Wind Rose



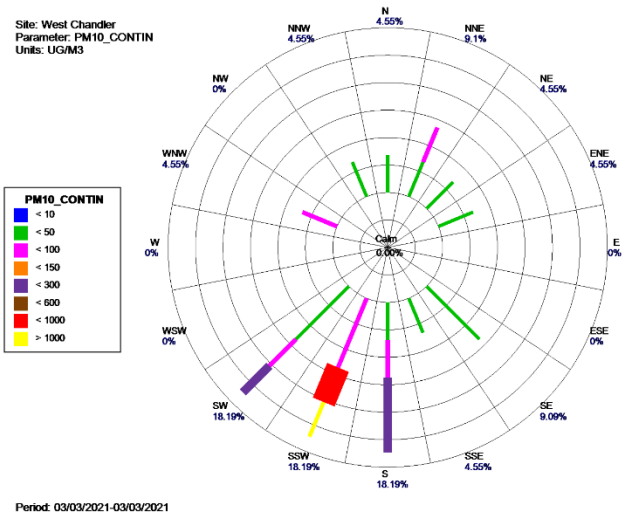
Higley PM_{10} Rose



West Chandler Wind Rose

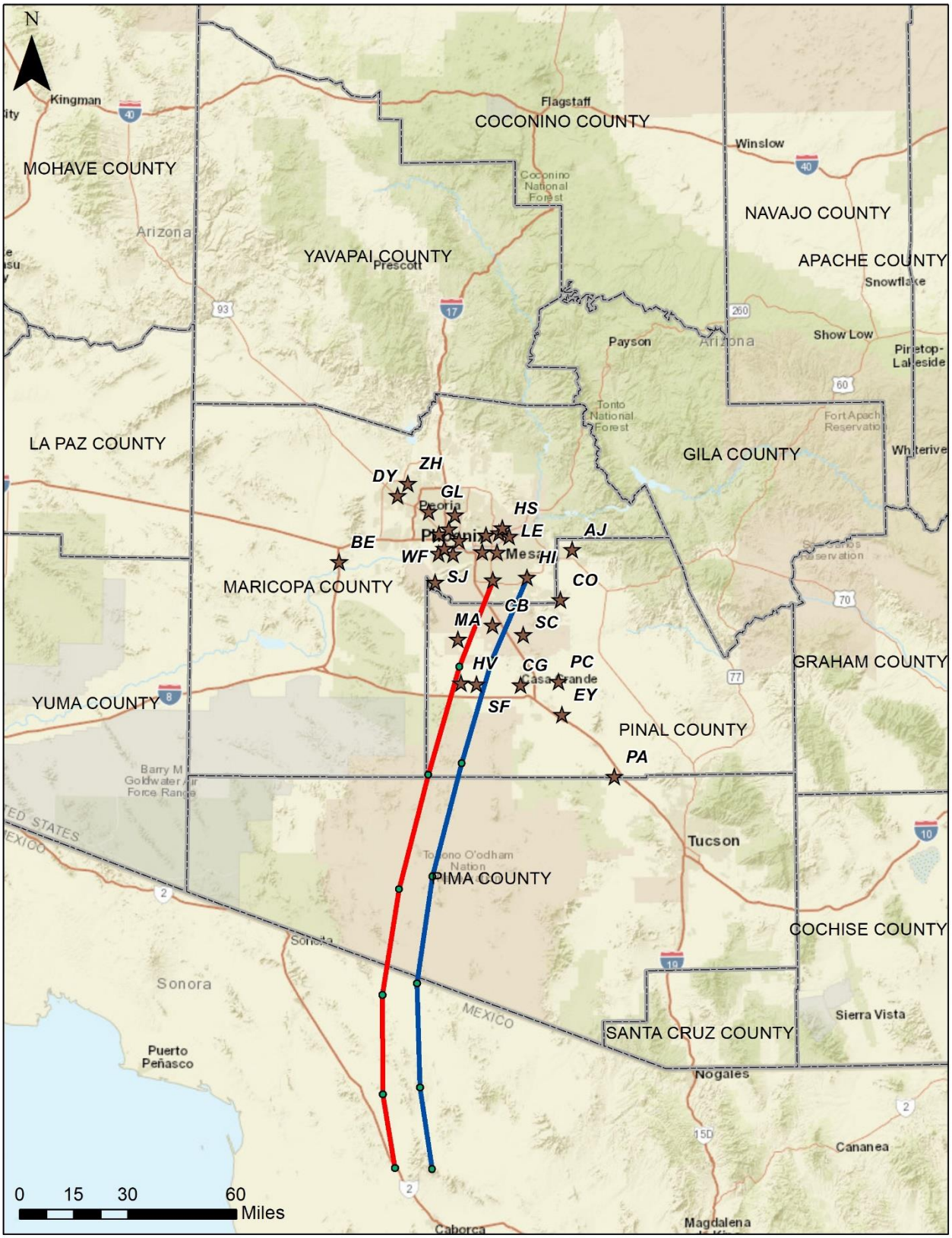


West Chandler PM_{10} Rose



HYSPLIT Back-Trajectory Analyses

Figure 3. HYSPLIT 6-hour back-trajectory ending at 4:00 p.m. on March 3, 2021, at both the Higley and West Chandler sites. Elevation at end time is 100 m AGL.



Proximity of Other Exceeding Sites to West Chandler and Higley

Note that Higley exceeded the 24-hour PM_{10} NAAQS on this date.

- Higley
  - Closest exceeding site: Casa Blanca (16 miles away)
  - Farthest exceeding site: Eloy (39.2 miles away)
- West Chandler
  - Closest exceeding site: Casa Blanca (12.5 miles away)
  - Farthest exceeding site: Eloy (42 miles away)

$PM_{10}/PM_{2.5}$ Ratios for Regional Air Monitors

Table 7. Hourly-averaged PM_{10}, $PM_{2.5}$, and PM_C for sites in Maricopa and Pinal counties having a continuous $PM_{2.5}$ monitor. Note that time reflects the hour of highest PM_{10} concentration on March 3, 2021.

Site	Time	PM_{10}	$PM_{2.5}$	PM_C	Ratio $PM_{2.5}/PM_{10}$
West Phoenix	ND	ND	ND	ND	ND
Mesa	5:00 p.m.	358.0	28.7	329.2	0.08
North Phoenix	5:00 p.m.	167.8	14.6	153.1	0.09
Glendale	ND	ND	ND	ND	ND
South Phoenix	4:00 p.m.	318.3	16.9	301.1	0.05
Tempe	5:00 p.m.	257.3	15.1	252.5	0.06
Durango Complex	3:00 p.m.	339.1	12.2	326.4	0.04
JLG Supersite	3:00 p.m.	543	27	516	0.05
Casa Grande Downtown	4:00 p.m.	889	45	844	0.05
Hidden Valley	4:00 p.m.	469	ND	ND	ND

ND: No data available in AQS for this day

ADEQ Visibility Camera Historical Archive

Archived photos from ADEQ's Visibility Camera Historical Archive for March 3, 2021. The image on the left reflects a time before the dust storm occurred and on the right during or after the storm's passage. The storm hit the Phoenix area at approximately 3:00-5:00 p.m.

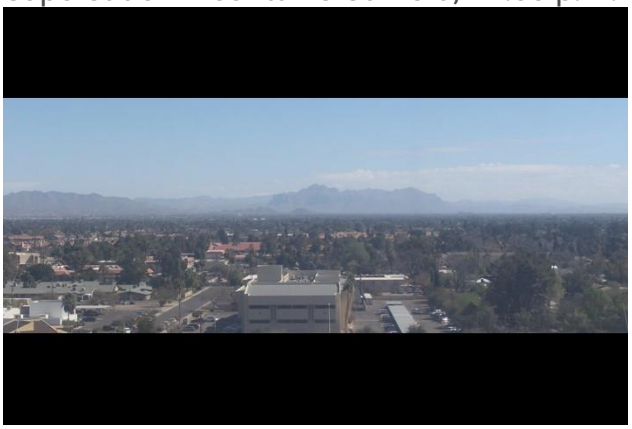
South Mountain Camera, 12:00 p.m.

South Mountain Camera, 4:45 p.m.

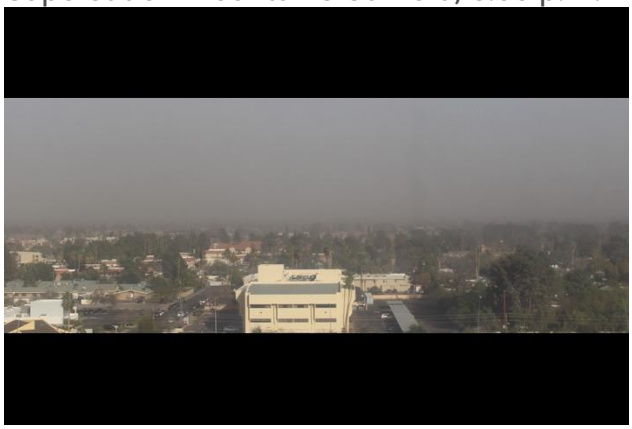
Camelback Mountain Camera, 1:00 p.m.

Camelback Mountain Camera, 3:45 p.m.

Superstition Mountains Camera, 12:00 p.m.



Superstition Mountains Camera, 5:00 p.m.



Compliance and Enforcement Activities

An evaluation of all inspections and air quality complaints indicates no evidence of unusual anthropogenic PM_{10} emissions during the time period of February 28 through March 6, 2021.

During this seven-day period the following activity took place:

- Number of inspections of permitted facilities: 289
    - Number of those facilities that were fugitive dust sources: 232
- Number of inspections that resulted in an enforcement action for PM_{10} and non-PM_{10}-related violations: 43
    - Number of enforcement actions that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 5
    - Details on enforcement actions: Four of the five violations that were noted during these inspections were for recordkeeping errors. The fifth violation was for excessive trackout at a construction site, which was required to be cleaned up immediately. Visible emissions of dust were not noted during any of these inspections.
- Number of complaints received: 58
    - Number of those complaints that were windblown dust or PM_{10} related: 50
    - Number of those complaints that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 1
    - Details on complaints within four-mile radius: Complaint was regarding earthmoving at a facility. No violations were noted during complaint inspections.

Atypical Event: April 21,2021

A high-wind event due to a low-pressure system moving through the state occurred on this date. Three monitoring sites in Pinal County exceeded the 24-hour PM_{10} NAAQS due to this storm.

ADEQ Pollution Forecast

The following selected portion of the forecast was made on Wednesday, April 21, 2021.

> "A low pressure wave positioned over the California/Nevada area this morning will gradually advance eastward into Arizona today. This wave will result in windy conditions across Arizona, including Maricopa and Pinal Counties. Winds are expected to be relatively strong this afternoon, around 20-30 mph at least, with higher gusts too. Therefore, the main concern for Phoenix's air quality today will be blowing dust.
>
> Blowing dust in the Valley could include both dust from local desert areas as well as dust brought in from the south/south-southwest. Already this morning, local dust-prone areas have seen elevated PM_{10} (dust) levels. PM_{10} could end up in the Moderate Air Quality Index (AQI) category at multiple monitors in the Valley today."

NWS Area Forecast Discussion

The following selected portions of the Area Forecast Discussion are from the National Weather Service office in Phoenix, AZ, for 2:27 p.m. MST Wednesday April 21, 2021.

> "Objective analysis shows a shortwave centered over southern Nevada with a moderate pressure gradient stepping over into Arizona. Analysis also shows a strong southerly 30-45 kt 850 mb jet that stretches from northern Sonora northward into south-central AZ. There have already been several wind gusts the 30-40 mph range and localized areas of blowing dust south and southwest of the Valley. Meanwhile, temperatures have already warmed up to mid to upper 80s under mostly sunny skies which will mix down those aforementioned stronger 850 mb winds to the surface this afternoon and evening.
>
> Wind gusts of 25 to 35 mph are anticipated to become more common this afternoon and evening across south-central AZ. The threat for new areas of blowing dust could grow this afternoon as long as the wind speeds remain this strong. A broad brush Blowing Dust Advisory has been issued for the areas south of the Phoenix metro where proximity to open desert and/or fallow fields is most prone to blowing dust Farther west, stronger winds of 40 to 50 mph will continue in the Mountain Springs area but there is about a 50% chance for sundowner wind gusts of 30 to 40 mph to reach the Imperial Valley between 6 pm and 10 pm this evening. With conditions generally dry and the fire danger high, these winds

will exacerbate fire weather concerns with conditions reaching critical thresholds for numerous areas. Fortunately, these strong winds are expected to subside a few hours after sunset."

Environmental Conditions at Air Monitoring Sites

Table 8. PM_{10} and wind data for PM air monitoring sites in Maricopa and Pinal counties on April 21, 2021.

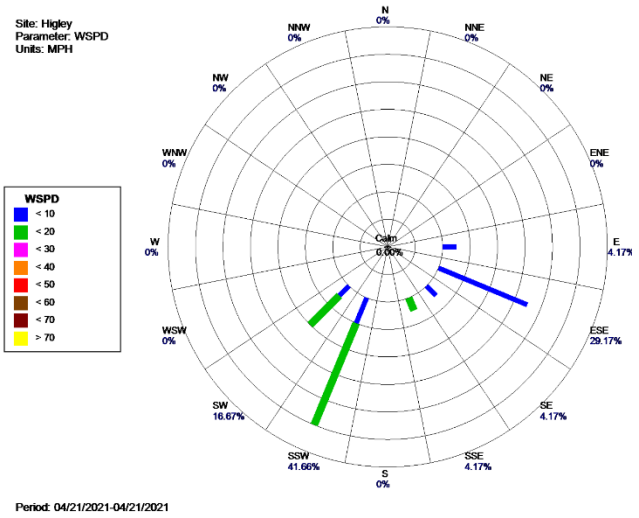
Site	24-hour PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
West Phoenix	43	15.8	5:00 p.m.	32.1	5:00 p.m.
Mesa	33	13.6	10:00 a.m.	32.6	3:00 p.m.
North Phoenix	42	13.2	4:00 p.m.	38.7	5:00 p.m.
Glendale	44	20.6	4:00 p.m.	37.7	4:00 p.m.
Central Phoenix	67	17.2	5:00 p.m.	35.2	5:00 p.m.
South Scottsdale	47	15.4	5:00 p.m.	31.4	12:00 p.m.
South Phoenix	50	11.5	400 p.m.	26.3	5:00 p.m.
West Chandler	65	16.8	10:00 a.m.	35.8	2:00 p.m.
Tempe	39	9.1	5:00 p.m.	25.7	10:00 a.m.
Higley	116	17.1	4:00 p.m.	35.7	4:00 p.m.
West 43rd Avenue	118	16.7	5:00 p.m.	33.2	4:00 p.m.
Dysart	55	14.5	5:00 p.m.	33.0	4:00 p.m.
Buckeye	85	16.8	5:00 p.m.	38.0	3:00 p.m.
Zuni Hills	48	22.2	4:00 p.m.	37.3	4:00 p.m.
St Johns	39	*	*	*	*
Senior Center	58	*	*	*	*

Site	24-hour PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
Lehi	58	*	*	*	*
High School	81	*	*	*	*
Durango Complex	48	13.4	5:00 p.m.	28.5	5:00 p.m.
JLG Supersite	43	9.3	4:00 p.m.	*	*
Casa Grande Downtown	106	*	*	*	*
AJ Fire Station	49	21.3	10:00 a.m.	23.7	10:00 a.m.
Pinal Air Park	97	*	*	*	*
Stanfield	202	19.9	1:00 p.m.	32.9	1:00 p.m.
Combs	93	*	*	*	*
Pinal County Housing	206#	*	*	*	*
Eloy	233#	*	*	*	*
Hidden Valley	108	22.8	12:00 p.m. & 3:00 p.m.	42.3	11:00 a.m.
Maricopa 1405	129	*	*	*	*
Sacaton	65	*	*	*	*
Casa Blanca	90	*	*	*	*

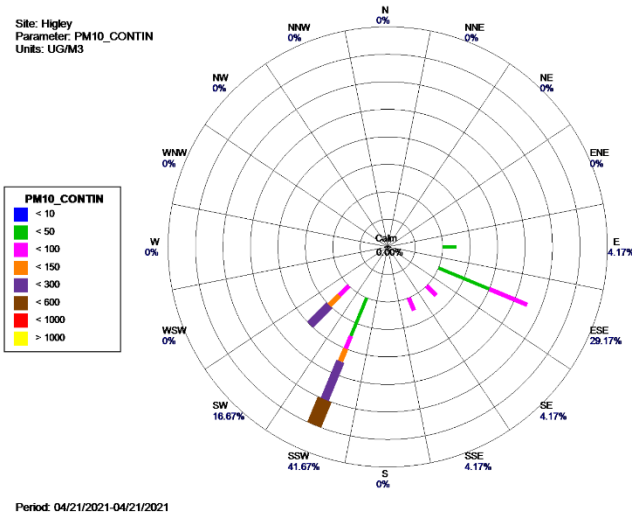
*Not available
#Exceedance of the 24-hour PM_{10} NAAQS

Pollution and Wind Roses for Higley and West Chandler Sites on April 21, 2021

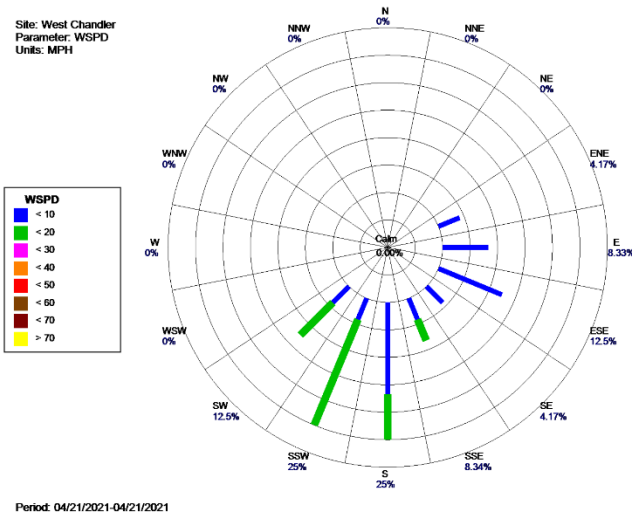
Higley Wind Rose



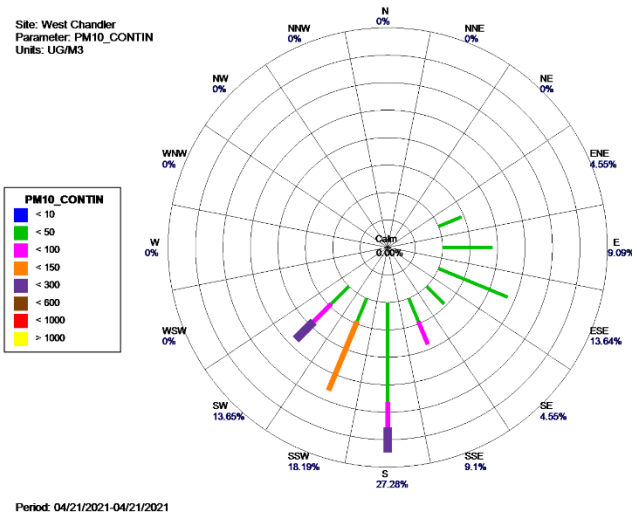
Higley PM_{10} Rose



West Chandler Wind Rose

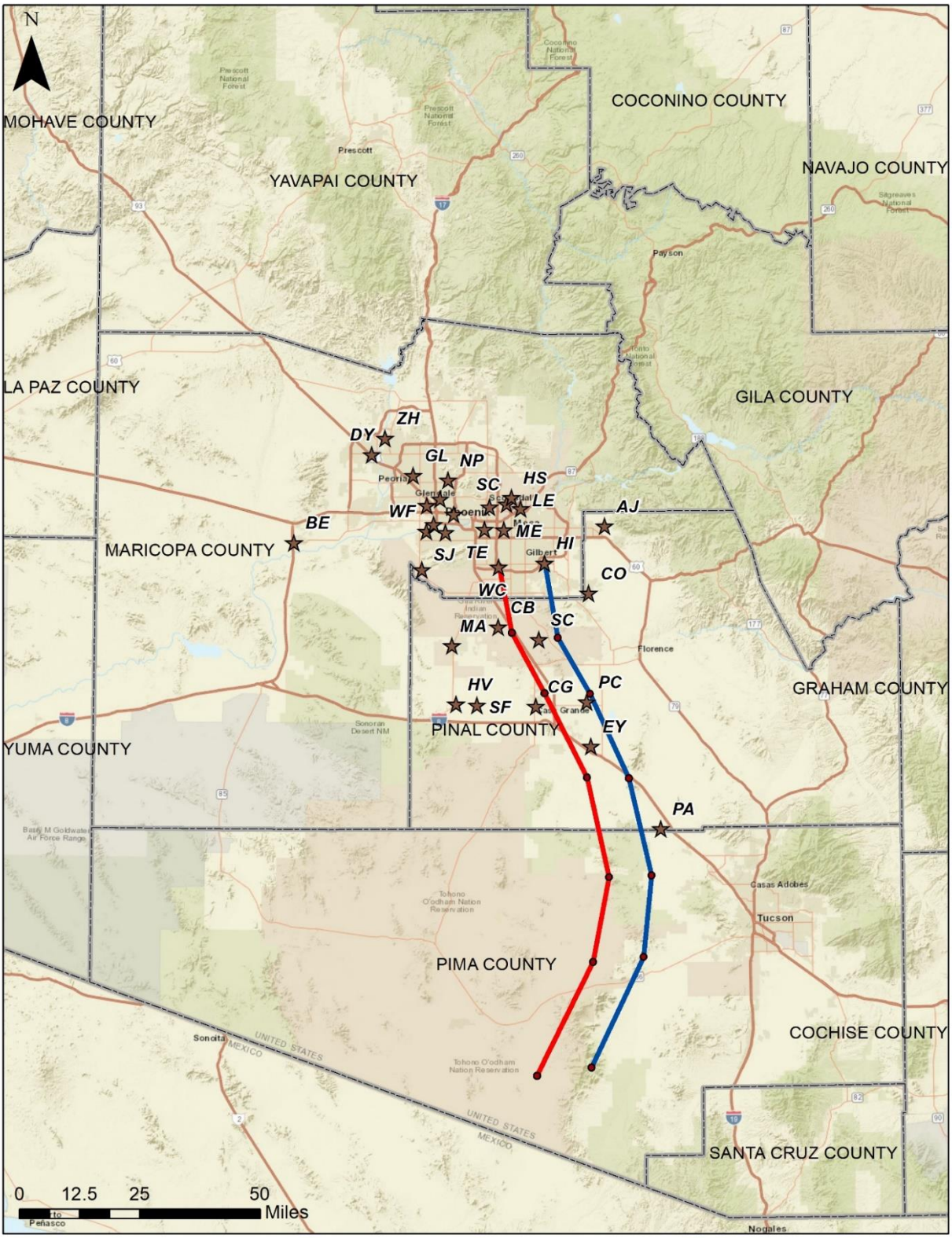


West Chandler PM_{10} Rose



HYSPLIT Back-Trajectory Analyses

Figure 4. HYSPLIT 6-hour back-trajectory ending at 10:00 a.m. on April 21, 2021, at both the Higley and West Chandler sites. Elevation at end time is 100 m AGL.



Proximity of Other Exceeding Sites to West Chandler and Higley

- Higley
  - Closest exceeding site: Pinal County Housing (30.1 miles away)
  - Farthest exceeding site: Eloy (39.2 miles away)
- West Chandler
  - Closest exceeding site: Stanfield (29.1 miles away)
  - Farthest exceeding site: Eloy (42 miles away)

$PM_{10}/PM_{2.5}$ Ratios for Regional Air Monitors

Table 9. Hourly-averaged PM_{10}, $PM_{2.5}$, and PM_C for sites in Maricopa and Pinal counties having a continuous $PM_{2.5}$ monitor. Note that time reflects the hour of highest PM_{10} concentration on April 21, 2021.

Site	Time	PM_{10}	$PM_{2.5}$	PM_C	Ratio $PM_{2.5}/PM_{10}$
West Phoenix	5:00 p.m.	211.6	22.9	188.6	0.11
Mesa	11:00 a.m.	85.9	7.7	78.1	0.09
North Phoenix	5:00 p.m.	204.2	21.3	182.8	0.10
Glendale	4:00 p.m.	216.2	19.2	196.9	0.09
South Phoenix	3:00 p.m.	137.4	13.7	123.4	0.10
Tempe	11:00 a.m.	114.6	9.3	105.2	0.08
Durango Complex	5:00 p.m.	138.1	13.0	124.9	0.09
JLG Supersite	5:00 p.m.	186	17	169	0.09
Casa Grande Downtown	11:00 a.m.	346	26	320	0.08
Hidden Valley	8:00 a.m.	428	27	401	0.06

ADEQ Visibility Camera Historical Archive

Archived photos from ADEQ's Visibility Camera Historical Archive for April 21, 2021. The image on the left reflects a time before the dust storm occurred and on the right during or after the storm's passage. The main storm hit the Phoenix area at approximately 4:00-5:00 p.m.

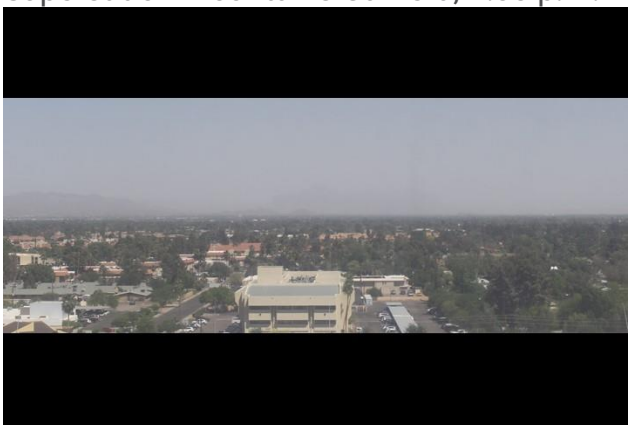
South Mountain Camera, 1:00 p.m.

South Mountain Camera, 4:30 p.m.

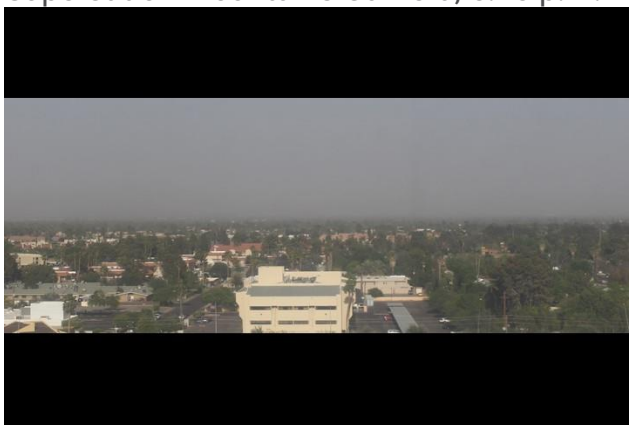
Camelback Mountain Camera, 12:00 p.m.

Camelback Mountain Camera, 4:45 p.m.

Superstition Mountains Camera, 2:00 p.m.



Superstition Mountains Camera, 5:15 p.m.



Compliance and Enforcement Activities

An evaluation of all inspections and air quality complaints indicates no evidence of unusual anthropogenic PM_{10} emissions during the time period of April 18 through April 24, 2021.

During this seven-day period the following activity took place:

- Number of inspections of permitted facilities: 239
    - Number of those facilities that were fugitive dust sources: 179
- Number of inspections that resulted in an enforcement action for PM_{10} and non-PM_{10}-related violations: 47
    - Number of enforcement actions that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 3
    - Details on enforcement actions: The three violations that were noted during inspections were for recordkeeping errors. Visible emissions of dust were not noted during any of these inspections.
- Number of complaints received: 58
    - Number of those complaints that were windblown dust or PM_{10} related: 47
    - Number of those complaints that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 3
    - Details on complaints within four-mile radius: One complaint was regarding residential construction activity and the other two were regarding construction activity at the same existing facility. No violations were noted during the complaint inspections.

Atypical Event: July 9, 2021

This high-wind event was due to summer monsoon storm activity which caused widespread blowing dust throughout the region. Five monitoring sites in Maricopa County exceeded the 24-hour PM_{10} NAAQS on this date.

ADEQ Pollution Forecast

The following selected portion of the forecast was made on Friday, July 9, 2021.

> "Strong to severe thunderstorms formed in the higher terrain northeast/east of Phoenix yesterday afternoon, but they quickly fell apart as they moved west/southwest off the higher terrain. So what will happen today?
>
> Latest water vapor satellite shows high pressure is now elongated along the Arizona/Utah border, which is providing an east/northeast flow over eastern and central Arizona. This is a good pattern to bring storms that develop along the rim down into the Valley if storms can survive off the higher terrain. For the most part, today looks like it will be very similar to the storm activity we saw yesterday. The best chance of storms this afternoon will be across the northern and eastern portion of the Valley, with a better chance of gusty outflows winds across the entire Valley. As was the case yesterday, with outflows winds coming from the east/northeast, not expecting widespread dust, but there could certainly be isolated pockets of dust, so use caution traveling."

NWS Area Forecast Discussion

The following selected portions of the Area Forecast Discussion are from the National Weather Service office in Phoenix, AZ, for 2:32 p.m. MST Friday, July 9, 2021.

> "Yesterday's forecast went as expected through the early evening with fairly strong storms propagating off the Rim and White Mountains into southern Gila and eastern Maricopa Counties. However, upper level support and outflow boundary interactions needed for lower desert storms did not pan out. Favorable parameters for convection, as discussed yesterday, are generally still in play for today. Storm chances and/or impacts more likely over the higher terrain compared to the lower desert. Warming temperatures will again mix through a deep boundary layer, eradicating a low level inversion, and further eating into the stronger midlevel inversion. The latest HREF indicates better potential for storms pushing through southern Yavapai County that could send strong outflows into northwestern Maricopa County. This activity is better situated to impact the Wickenburg area but could stretch as far east as the northwest Valley. Overall, storm chances in the Valley (or anywhere in the lower desert) are still low, around 10-20%. Any storms that do develop, whether in Gila County or elsewhere, will be capable of producing strong localized wind gusts of 40-60 mph, outflow winds, and locally heavy rain."

Environmental Conditions at Air Monitoring Sites

Table 10. PM_{10} and wind data for PM air monitoring sites in Maricopa and Pinal counties on July 9, 2021.

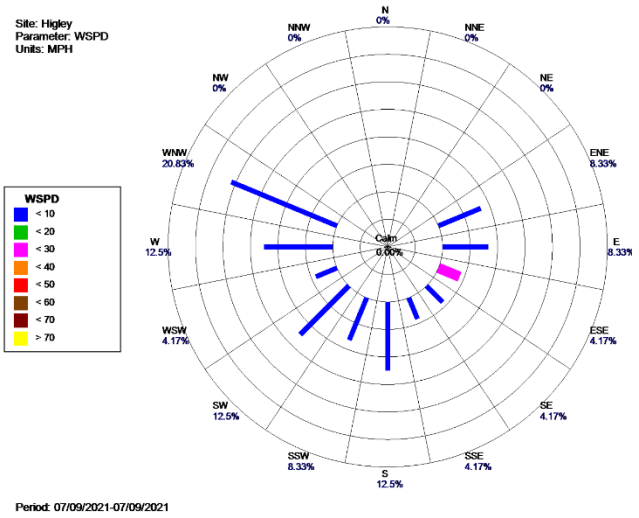
Site	24-hour PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
West Phoenix	126	9.8	11:00 p.m.	32.6	10:00 p.m.
Mesa	199#	10.3	10:00 p.m.	41.9	10:00 p.m.
North Phoenix	98	9.3	11:00 p.m.	36.9	10:00 p.m.
Glendale	107	15.2	11:00 p.m.	32.5	11:00 p.m.
Central Phoenix	122	11.3	1:00 a.m.	33.6	10:00 p.m.
South Scottsdale	188#	9.5	12:00 a.m.	36.1	10:00 p.m.
South Phoenix	90	9.1	11:00 p.m.	34.9	10:00 p.m.
West Chandler	165#	13.0	10:00 p.m.	47.5	10:00 p.m.
Tempe	208#	7.8	11:00 p.m.	34.5	10:00 p.m.
Higley	130	21.1	10:00 p.m.	63.8	10:00 p.m.
West 43rd Avenue	143	11.0	11:00 p.m.	39.6	10:00 p.m.
Dysart	111	12.2	11:00 p.m.	29.4	11:00 p.m.
Buckeye	35	11.5	9:00 p.m.	28.3	11:00 p.m.
Zuni Hills	84	13.8	6:00 p.m.	31.8	11:00 p.m.
St Johns	182#	*	*	*	*
Senior Center	51	*	*	*	*
Lehi	39	*	*	*	*
High School	51	*	*	*	*

Site	24-hour PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
Durango Complex	131	10.5	11:00 p.m.	29.4	10:00 p.m.
JLG Supersite	116	8.4	11:00 p.m.	*	*
Casa Grande Downtown	76	*	*	*	*
AJ Fire Station	33	*	*	*	*
Pinal Air Park	46	*	*	*	*
Stanfield	60	*	*	*	*
Combs	32	*	*	*	*
Pinal County Housing	53	*	*	*	*
Eloy	93	*	*	*	*
Hidden Valley	107	*	*	*	*
Maricopa 1405	37	*	*	*	*
Sacaton	30	*	*	*	*
Casa Blanca	49	*	*	*	*

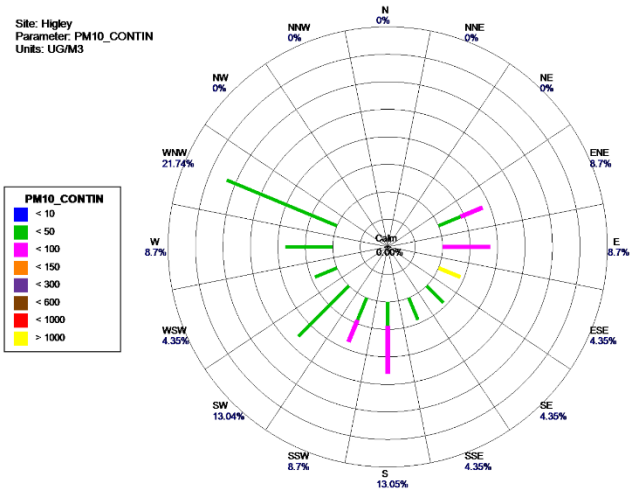
*Not available
#Exceedance of the 24-hour PM_{10} NAAQS

Pollution and Wind Roses for Higley and West Chandler Sites on July 9, 2021

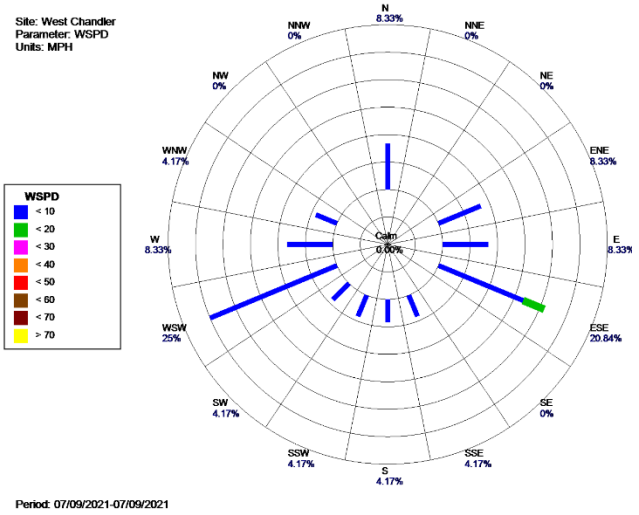
Higley Wind Rose



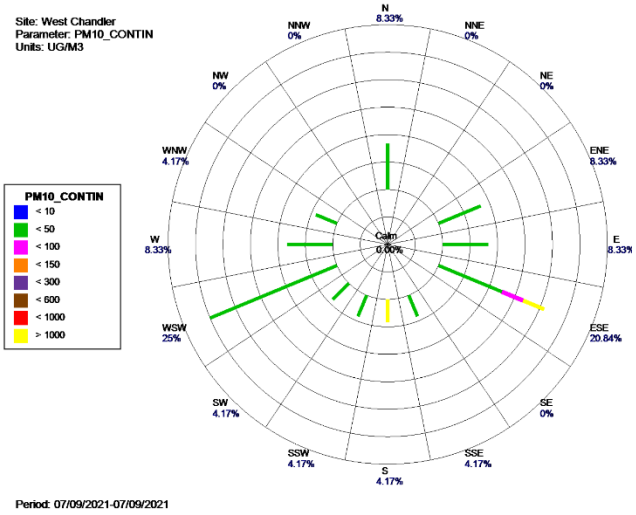
Higley PM_{10} Rose



West Chandler Wind Rose

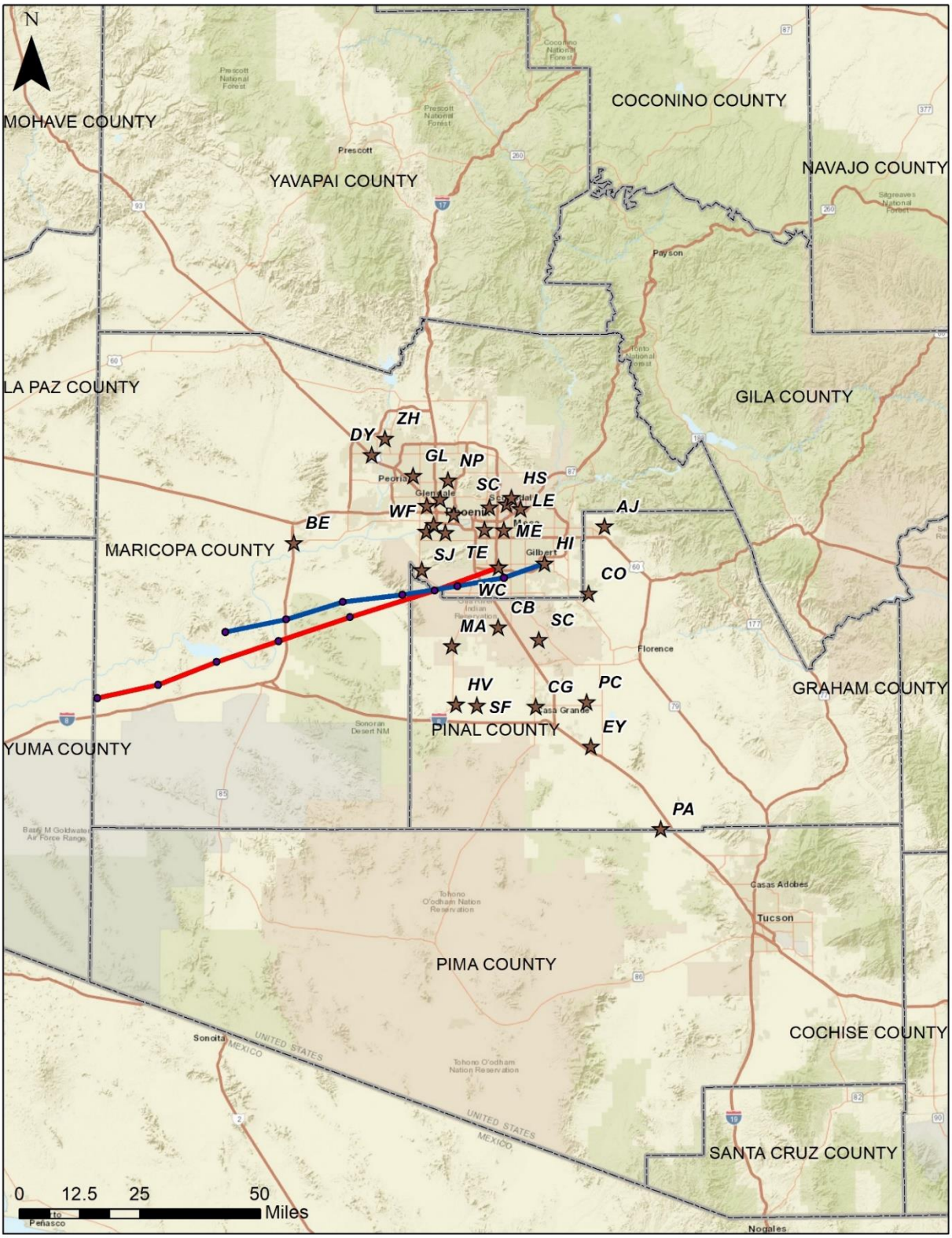


West Chandler PM_{10} Rose



HYSPLIT Back-Trajectory Analyses

Figure 5. HYSPLIT 6-hour back-trajectory ending at 10:00 p.m. on July 9, 2021, at both the Higley and West Chandler sites. Elevation at end time is 100 m AGL.



Proximity of Other Exceeding Sites to West Chandler and Higley

Note that West Chandler exceeded the 24-hour PM_{10} NAAQS on this date.

- Higley
  - Closest exceeding site: West Chandler (9.5 miles away)
  - Farthest exceeding site: St. Johns (25.5 miles away)
- West Chandler
  - Closest exceeding site: Mesa (7.8 miles away)
  - Farthest exceeding site: St. Johns (16 miles away)

$PM_{10}/PM_{2.5}$ Ratios for Regional Air Monitors

Table 11. Hourly-averaged PM_{10}, $PM_{2.5}$, and PM_C for sites in Maricopa and Pinal counties having a continuous $PM_{2.5}$ monitor. Note that time reflects the hour of highest PM_{10} concentration on July 9, 2021.

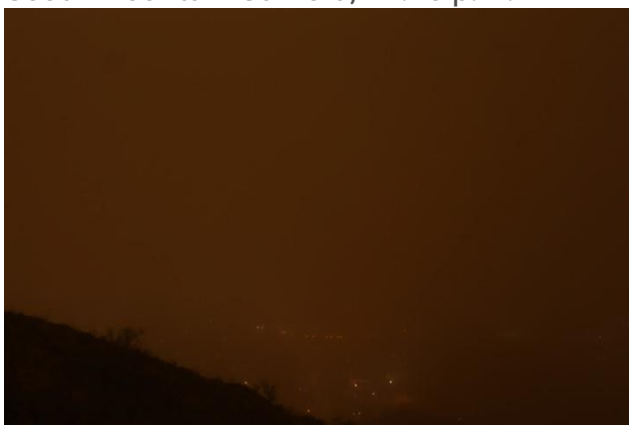
Site	Time	PM_{10}	$PM_{2.5}$	PM_C	Ratio $PM_{2.5}/PM_{10}$
West Phoenix	11:00 p.m.	2669.0	197.8	2470.0	0.07
Mesa	11:00 p.m.	3741.1	333.7	3407.3	0.09
North Phoenix	11:00 p.m.	2007.8	152.3	1855.7	0.08
Glendale	11:00 p.m.	2132.6	187.0	1945.2	0.09
South Phoenix	11:00 p.m.	1584.5	126.9	1465.9	0.08
Tempe	11:00 p.m.	3957.5	179.5	3777.2	0.05
Durango Complex	11:00 p.m.	2644.9	202.8	2439.2	0.08
JLG Supersite	11:00 p.m.	2305	178	2127	0.08
Casa Grande Downtown	10:00 p.m.	1118	143	975	0.13
Hidden Valley	10:00 p.m.	1017	72	945	0.07

ADEQ Visibility Camera Historical Archive

Archived photos from ADEQ's Visibility Camera Historical Archive July 9, 2021. The image on the left reflects a time before the dust storm occurred and on the right during or after the storm's passage. The storm hit the Phoenix area at approximately 10:00 p.m.

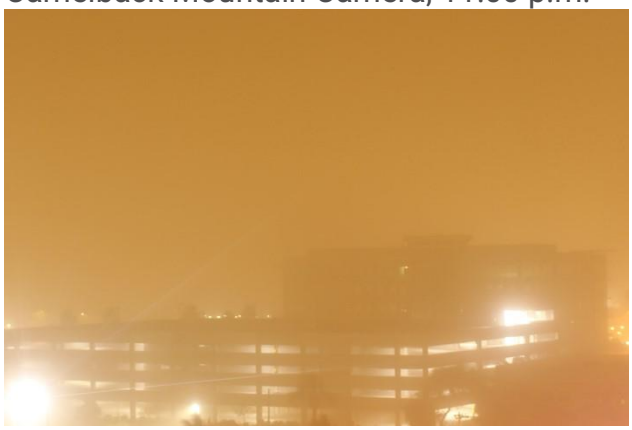
South Mountain Camera, 10:30 p.m.

South Mountain Camera, 11:15 p.m.

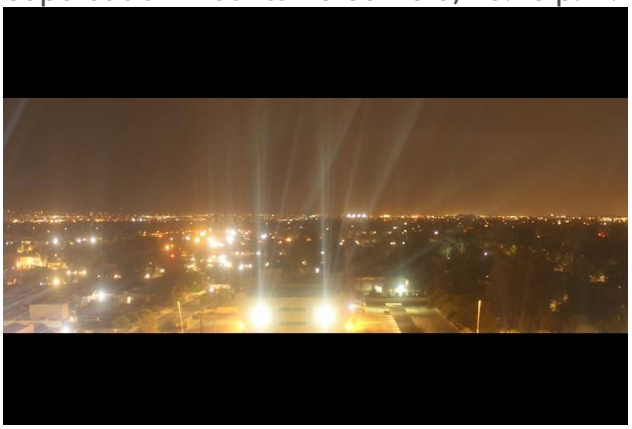


Camelback Mountain Camera, 10:00 p.m.

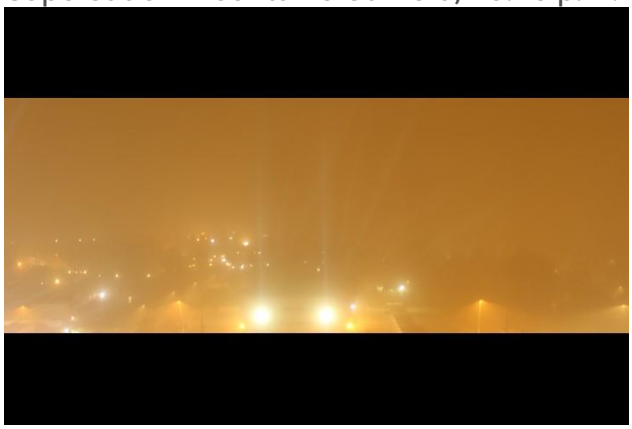
Camelback Mountain Camera, 11:00 p.m.



Superstition Mountains Camera, 10:15 p.m.



Superstition Mountains Camera, 10:45 p.m.



Compliance and Enforcement Activities

An evaluation of all inspections and air quality complaints indicates no evidence of unusual anthropogenic PM_{10} emissions during the time period of July 6 through July 12, 2021.

During this seven-day period the following activity took place:

- Number of inspections of permitted facilities: 179
    - Number of those facilities that were fugitive dust sources: 174
- Number of inspections that resulted in an enforcement action for PM_{10} and non-PM_{10}-related violations: 12
    - Number of enforcement actions that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 1
    - Details on enforcement actions: The one violation that was noted during this inspection was for a recordkeeping error. Visible emissions of dust were not noted during this inspection.
- Number of complaints received: 23
    - Number of those complaints that were windblown dust or PM_{10} related: 22
    - Number of those complaints that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 0

Atypical Event: October 11, 2021

A high-wind event due to a low-pressure system moving through the state occurred on this date and caused widespread blowing dust throughout the region. The storm occurred late evening on October 11 and continued into October 12. Five monitoring sites, in both Maricopa and Pinal counties, exceeded the 24-hour PM_{10} NAAQS on October 11.

ADEQ Pollution Forecast

The following selected portions of the forecast was made on Friday, October 8, 2021, and includes anticipated conditions for the entire weekend.

> "…Two fairly strong low pressure troughs (waves) will batter the Southwest during this forecast period…"
>
> "…However, in regards to PM_{10} (dust), average PM_{10} levels are a little more volatile during this time of year. This is because PM_{10} levels generally rise and fall with the low pressure troughs that are common during this season.
>
> The first wave in line to affect the Southwest during this forecast period will result in breezy westerly winds in the afternoons today and Saturday. Pockets of dust may be possible. But the second wave, set to move in by Monday, will bring stronger winds out of the southwest (10-20 mph with higher gusts). Winds will then shift to out of the northwest on Tuesday. Elevated PM_{10} levels will be possible on both Monday and Tuesday."

NWS Area Forecast Discussion

The following selected portions of the Area Forecast Discussion are from the National Weather Service office in Phoenix, AZ, for 2:10 p.m. MST Monday, October 11, 2021.

> "The low pressure system responsible for the windy conditions continues to plunge southward through the Sierra Nevada of central California. The well-defined vort max evident on water vapor will blast through southeastern California this afternoon and winds will then increase in response to a tightening pressure gradient. Latest visible satellite imagery already reveals areas of blowing dust near the Salton Sea. The dust is expected to expand rapidly eastward this afternoon and this evening, and a Blowing Dust Advisory has been issued for the lower deserts.
>
> Latest deterministic models continue to trend even stronger with the wind fields 850 mb and below. Wind gusts will be maximized later this afternoon across southeastern California, and this evening across central Arizona just ahead of the eastward advancing cold front. Latest forecast soundings and HREF ensemble maxes suggest peak gusts to 55 mph will not be out of the question across the western deserts. Peak gusts could also reach up to 45 mph in the Phoenix area, which will certainly be strong

enough to send decorations airborne. Wind gusts up to 70 will also be possible along I-8 in extreme southwestern Imperial County."

Environmental Conditions at Air Monitoring Sites

Table 12. PM_{10} and wind data for PM air monitoring sites in Maricopa and Pinal counties on October 11, 2021.

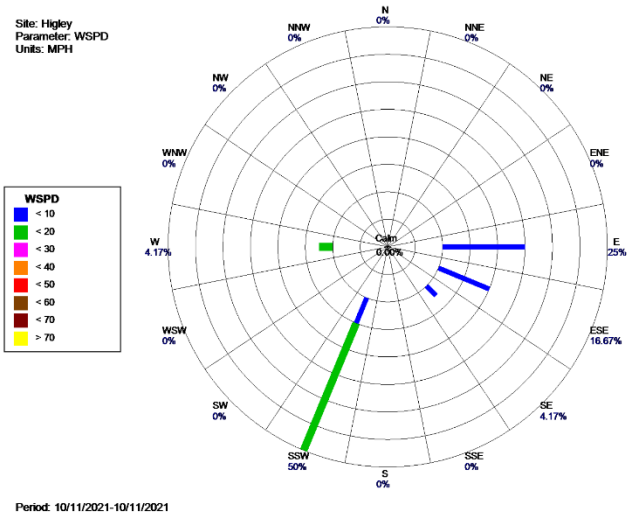
Site	24-hour PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
West Phoenix	59	12.8	8:00 p.m.	43.2	10:00 p.m.
Mesa	74	15.3	9:00 p.m.	36.2	10:00 p.m.
North Phoenix	47	11.6	9:00 p.m.	39.4	10:00 p.m.
Glendale	61	20.3	8:00 p.m.	46.0	10:00 p.m.
Central Phoenix	94	16.7	8:00 p.m.	56.3	10:00 p.m.
South Scottsdale	88	14.5	10:00 p.m.	44.7	10:00 p.m.
South Phoenix	69	14.4	8:00 p.m.	44.7	10:00 p.m.
West Chandler	160#	19.9	9:00 p.m.	45.6	10:00 p.m.
Tempe	83	10.3	9:00 p.m.	41.1	10:00 p.m.
Higley	134	18.4	7:00 p.m.	36.2	7:00 p.m.
West 43rd Avenue	110	14.6	8:00 p.m.	38.5	9:00 p.m.
Dysart	155#	15.4	10:00 p.m.	36.9	9:00 p.m.
Buckeye	258#	22.9	10:00 p.m.	46.1	10:00 p.m.
Zuni Hills	122	19.2	9:00 p.m.	55.1	10:00 p.m.
St Johns	134	*	*	*	*
Senior Center	115	*	*	*	*
Lehi	ND	*	*	*	*

Site	24-hour PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
High School	101	*	*	*	*
Durango Complex	79	15.0	8:00 p.m.	38.1	10:00 p.m.
JLG Supersite	79	11.3	9:00 p.m.	*	*
Casa Grande Downtown	112	*	*	*	*
AJ Fire Station	59	21.3	10:00 p.m.	24.0	10:00 p.m.
Pinal Air Park	36	*	*	*	*
Stanfield	150	20.1	11:00 p.m.	38.3	11:00 p.m.
Combs	79	*	*	*	*
Pinal County Housing	143	25.5	11:00 p.m.	42.7	10:00 p.m.
Eloy	129	*	*	*	*
Hidden Valley	184#	30.2	9:00 p.m.	48.3	10:00 p.m.
Maricopa 1405	106	*	*	*	*
Sacaton	87	*	*	*	*
Casa Blanca	158#	*	*	*	*

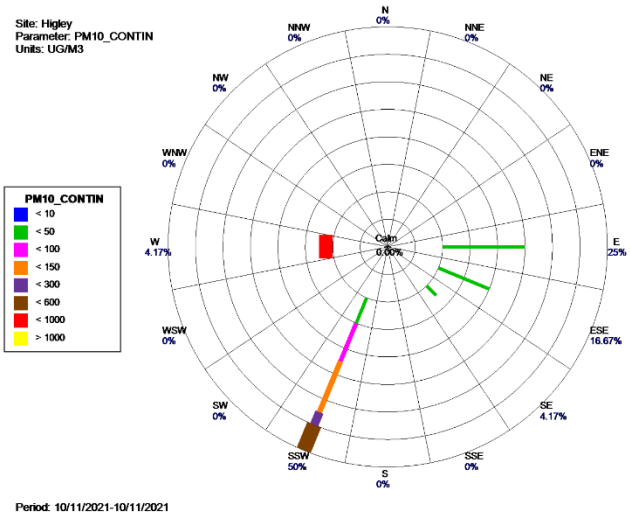
*Not available
#Exceedance of the 24-hour PM_{10} NAAQS
ND: No data available in AQS for this day

Pollution and Wind Roses for Higley and West Chandler Sites on October 11, 2021

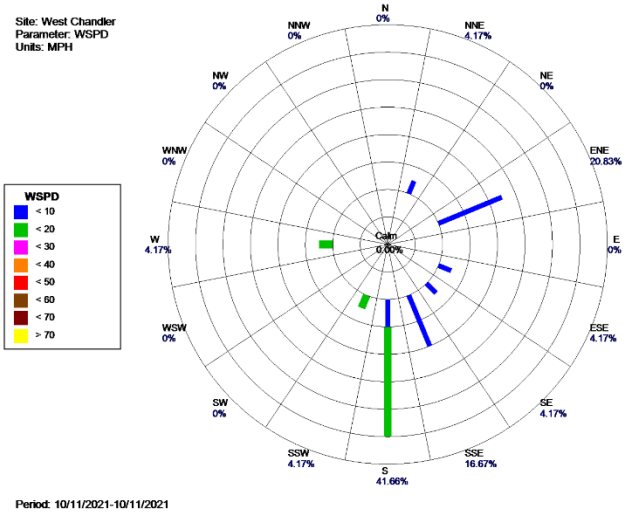
Higley Wind Rose



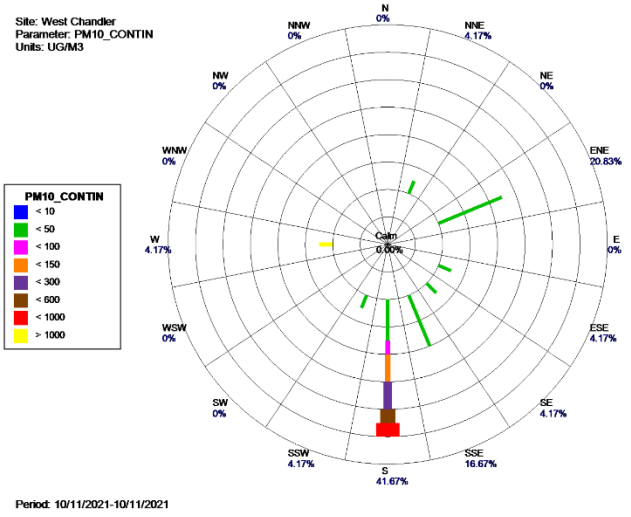
Higley PM_{10} Rose



West Chandler Wind Rose

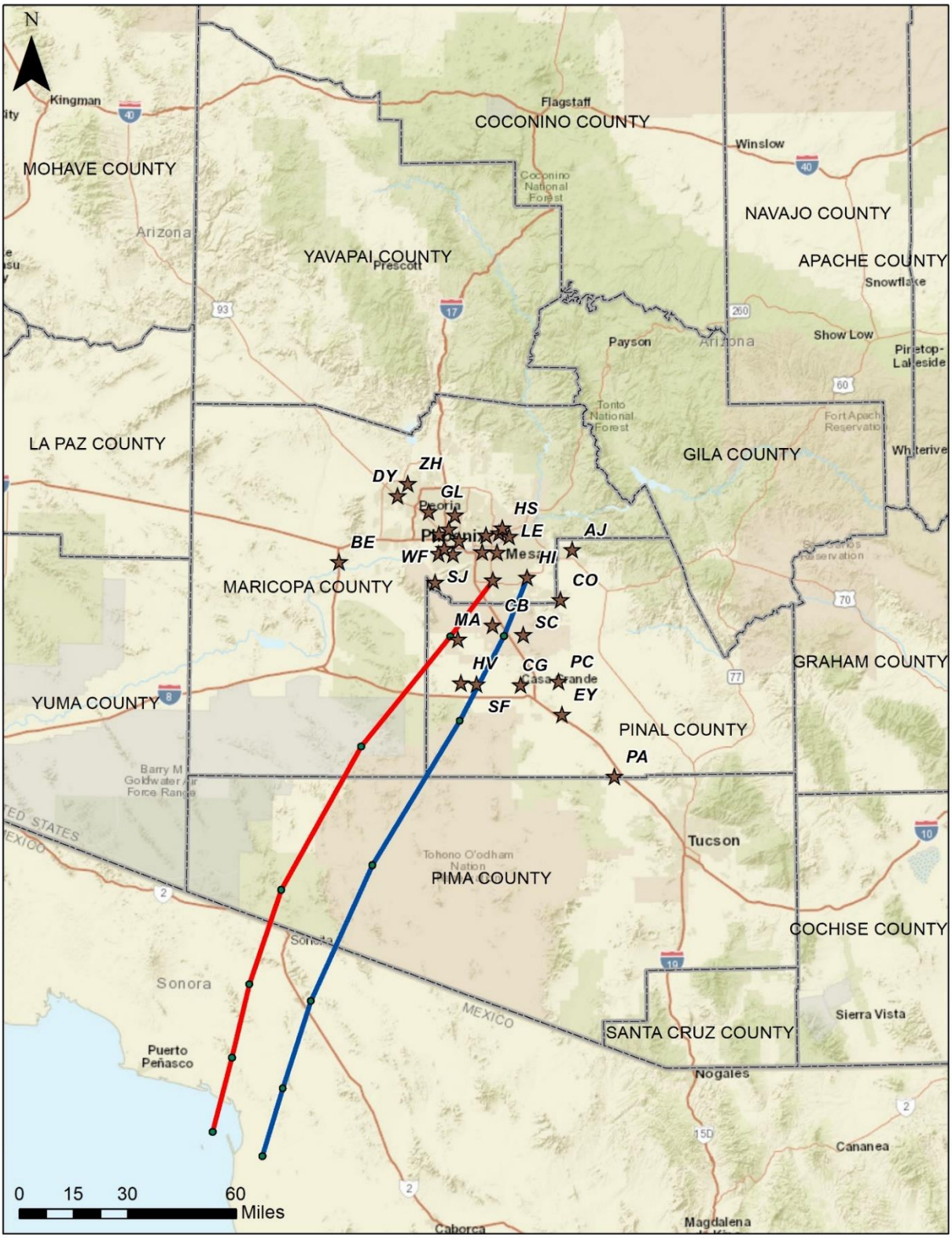


West Chandler PM_{10} Rose



HYSPLIT Back-Trajectory Analyses

Figure 6. HYSPLIT 6-hour back-trajectory ending at 11:00 p.m. on October 11, 2021, at both the Higley and West Chandler sites. Elevation at end time is 100 m AGL.



Proximity of Other Exceeding Sites to West Chandler and Higley

Note that West Chandler exceeded the 24-hour PM_{10} NAAQS on this date.

- Higley
  - Closest exceeding site: West Chandler (9.5 miles away)
  - Farthest exceeding site: Buckeye (52.3 miles away)
- West Chandler
  - Closest exceeding site: Casa Blanca (12.5 miles away)
  - Farthest exceeding site: Buckeye (43 miles away)

$PM_{10}/PM_{2.5}$ Ratios for Regional Air Monitors

Table 13. Hourly-averaged PM_{10}, $PM_{2.5}$ and PM_C for sites in Maricopa and Pinal counties having a continuous $PM_{2.5}$ monitor. Note that time reflects the hour of highest PM_{10} concentration on October 11, 2021.

Site	Time	PM_{10}	$PM_{2.5}$	PM_C	Ratio $PM_{2.5}/PM_{10}$
West Phoenix	11:00 p.m.	560.0	71.9	487.7	0.13
Mesa	11:00 p.m.	657.3	85.5	571.6	0.13
North Phoenix	11:00 p.m.	505.6	71.9	433.6	0.14
Glendale	11:00 p.m.	609.2	91.4	517.5	0.15
South Phoenix	11:00 p.m.	809.0	107.2	706.9	0.13
Tempe	11:00 p.m.	686.5	102.6	583.2	0.15
Durango Complex	11:00 p.m.	820.0	102.3	717.1	0.12
JLG Supersite	11:00 p.m.	925	111	814	0.12
Casa Grande Downtown	11:00 p.m.	825	47	778	0.06
Hidden Valley	11:00 p.m.	540	61	479	0.11

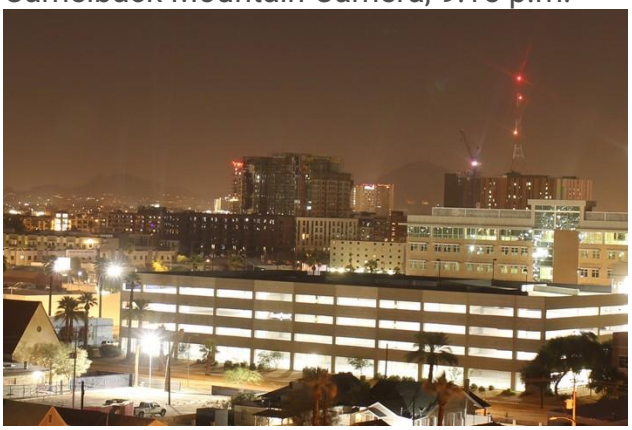
ADEQ Visibility Camera Historical Archive

Archived photos from ADEQ's Visibility Camera Historical Archive for October 11, 2021. The image on the left reflects a time before the dust storm occurred and on the right during or after the storm's passage. The storm hit the Phoenix area at approximately 9:00-10:00 p.m.

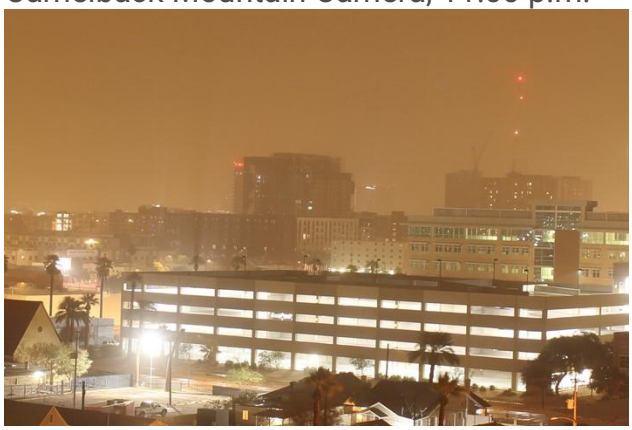
South Mountain Camera, 4:30 p.m.

Note: There are no images available in the archive for South Mountain camera after 4:30 p.m. on October 11, 2021

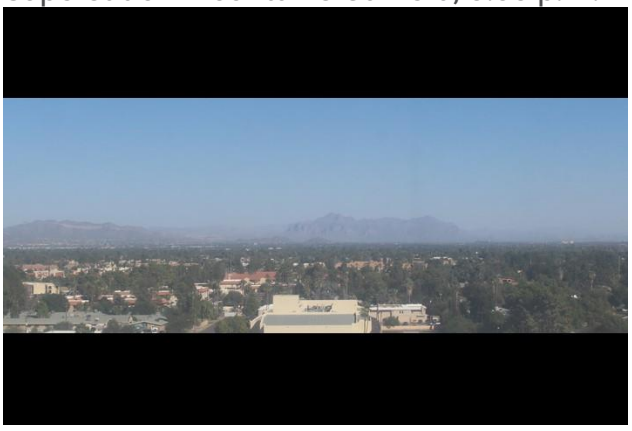
Camelback Mountain Camera, 9:15 p.m.



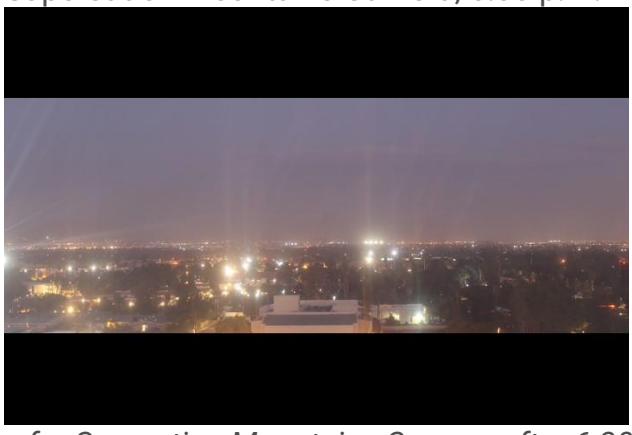
Camelback Mountain Camera, 11:00 p.m.



Superstition Mountains Camera, 3:00 p.m.



Superstition Mountains Camera, 6:30 p.m.



Note: There are no images available in the archive for Superstion Mountains Camera after 6:30 p.m.on October 11, 2021

Compliance and Enforcement Activities

An evaluation of all inspection reports and air quality complaints indicates no evidence of unusual anthropogenic PM_{10} emissions during the time period of October 8 through October 14, 2021.

During this seven-day period the following activity took place:

- Number of inspections of permitted facilities: 205
    - Number of those facilities that were fugitive dust sources: 157
- Number of inspections that resulted in an enforcement action taken for PM_{10} and non-PM_{10}-related violations: 35
    - Number of enforcement actions that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 1
    - Details on enforcement actions: The one violation that was noted during this inspection was for a recordkeeping error. Visible emissions of dust were not noted during this inspection.
- Number of complaints received: 25
    - Number of those complaints that were windblown dust or PM_{10} related: 17
    - Number of those complaints that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 0

Atypical Event: October 12, 2021

A high-wind event due to a low-pressure system moving through the state occurred on this date. This caused widespread blowing dust throughout the region. The storm occurred late evening on October 11 and continued into October 12. Twenty-one monitoring sites, in both Maricopa and Pinal counties, exceeded the 24-hour PM_{10} NAAQS on October 12, 2021.

ADEQ Pollution Forecast

The following selected portion of forecast was made for Tuesday, October 12, 2021.

> "Valley residents have woken up to a cool, hazy morning, thanks to a strong low pressure system over the region and its cold front that swept through Arizona last night. Both PM_{10} (dust) and $PM_{2.5}$ (smoke) reached significant levels around midnight and are still elevated from West Valley to East Valley (as of 8 a.m.).
>
> Looking ahead, today will be the coolest day of the week, with highs only forecast to max out around 70°F--maybe even lower. Winds will also increase out of the west in the afternoon, but they won't be near as strong as yesterday's winds. Daytime heating and winds should help to disperse this morning's high PM_{10} and $PM_{2.5}$ levels. But the damage has already been done, and PM_{10} will most likely exceed the health standard today because of the morning levels. Therefore, we've issued a PM_{10} High Pollution Advisory. $PM_{2.5}$ will easily reach the Moderate Air Quality Index (AQI) category."

NWS Area Forecast Discussion

The following selected portions of the Area Forecast Discussion are from the National Weather Service office in Phoenix, AZ, for 4:54 a.m. MST Tuesday, October 12, 2021. Note that the storm hit the Phoenix area on October 11 before 11:59 p.m. The storm was forecasted on October 11 and the following post-storm discussion was issued early in the morning on October 12.

> "An anomalously cold upper level low continues to track across the Desert Southwest early this morning with the low center across northern Arizona. The associated cold front has already swept through most of Arizona with winds diminishing fairly quickly behind the front. Gusty winds to around 30-40 mph across eastern Arizona will remain an issue through around sunrise, but winds will continue to decrease through the rest of the morning as the system continues to track to northeast."

Environmental Conditions at Air Monitoring Sites

Table 14. PM_{10} and wind data for PM air monitoring sites in Maricopa and Pinal counties on October 12, 2021.

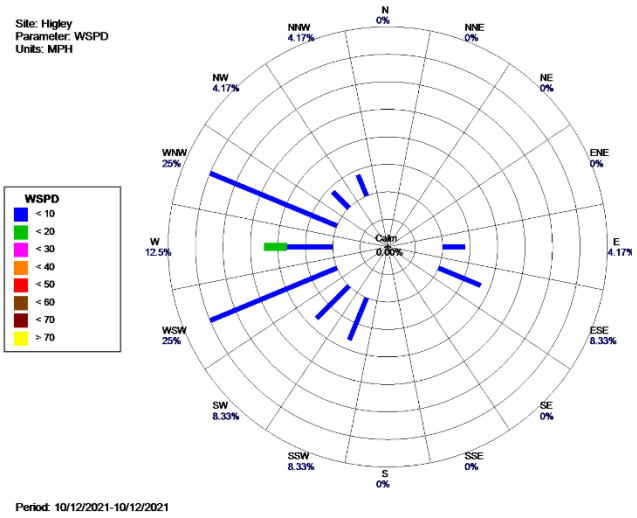
Site	24-hour PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
West Phoenix	141	11.5	12:00 a.m.	32.7	3:00 p.m.
Mesa	170#	8.3	12:00 a.m.	28.5	12:00 a.m.
North Phoenix	143	7.9	1:00 a.m.	22.8	1:00 a.m.
Glendale	140	12.5	1:00 a.m.	23.0	12:00 a.m.
Central Phoenix	170#	17.4	12:00 a.m.	34.8	12:00 a.m.
South Scottsdale	180#	14.2	1:00 a.m.	32.9	1:00 a.m.
South Phoenix	144	12.3	12:00 a.m.	30.3	12:00 a.m.
West Chandler	181#	9.4	12:00 a.m.	28.1	12:00 a.m.
Tempe	158#	6.8	12:00 a.m.	26.3	12:00 a.m.
Higley	219#	11.6	12:00 a.m.	30.1	12:00 a.m.
West 43rd Avenue	166#	11.2	12:00 a.m.	27.4	12:00 a.m.
Dysart	137	6.5	1:00 a.m.	19.8	1:00 a.m.
Buckeye	149	10.1	1:00 a.m.	31.0	1:00 a.m.
Zuni Hills	142	10.5	2:00 a.m.	25.1	1:00 a.m.
St Johns	142	*	*	*	*
Senior Center	174#	*	*	*	*

Site	24-hour PM_{10} ($\mu g/m^3$)	Max Hourly-Averaged Wind Speed (MPH)	Time	Max Wind Gust (MPH)	Time
Lehi	ND	*	*	*	*
High School	156#	*	*	*	*
Durango Complex	163#	13.6	12:00 a.m.	33.5	12:00 p.m.
JLG Supersite	144	7.3	1:00 a.m.	*	*
Casa Grande Downtown	264#	*	*	*	*
AJ Fire Station	179#	14.4	1:00 a.m.	17.3	1:00 a.m.
Pinal Air Park	180#	*	*	*	*
Stanfield	235#	18.4	12:00 a.m. & 1:00 a.m.	29.5	12:00 a.m.
Combs	242#	*	*	*	*
Pinal County Housing	263#	18.7	2:00 a.m.	36.5	12:00 a.m.
Eloy	219#	*	*	*	*
Hidden Valley	222#	17.4	1:00 a.m.	35.3	2:00 a.m.
Maricopa 1405	217#	*	*	*	*
Sacaton	285#	*	*	*	*
Casa Blanca	259#	*	*	*	*

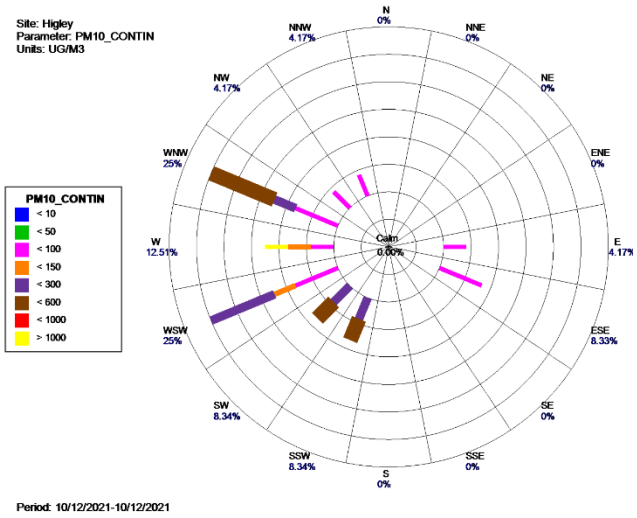
*Not available
#Exceedance of the 24-hour PM_{10} NAAQS
ND: No data available in AQS for this day

Pollution and Wind Roses for Higley and West Chandler Sites on October 12, 2021

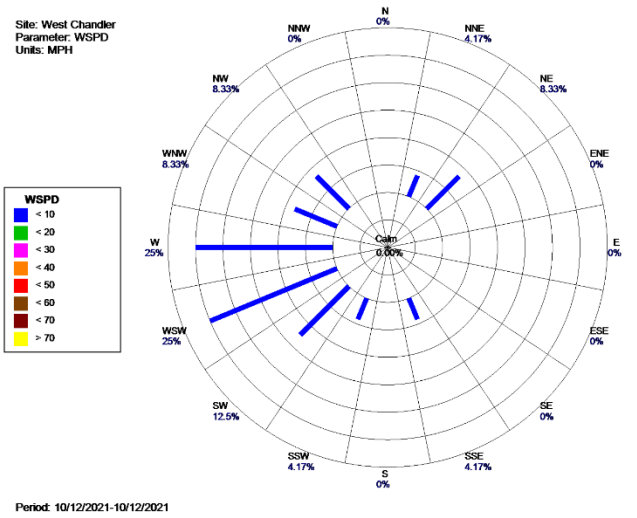
Higley Wind Rose



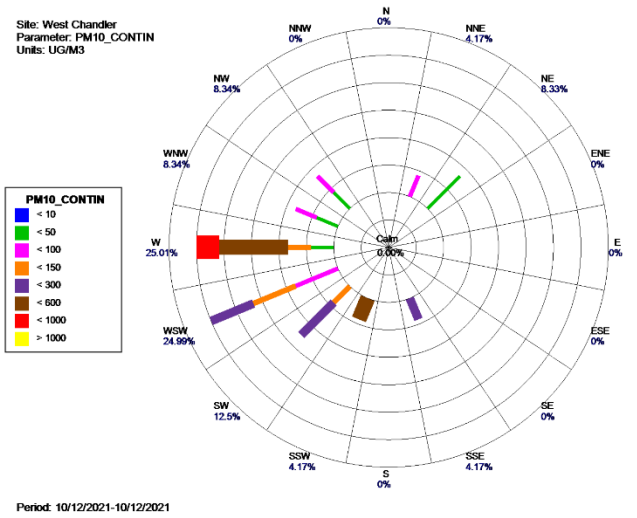
Higley PM_{10} Rose



West Chandler Wind Rose

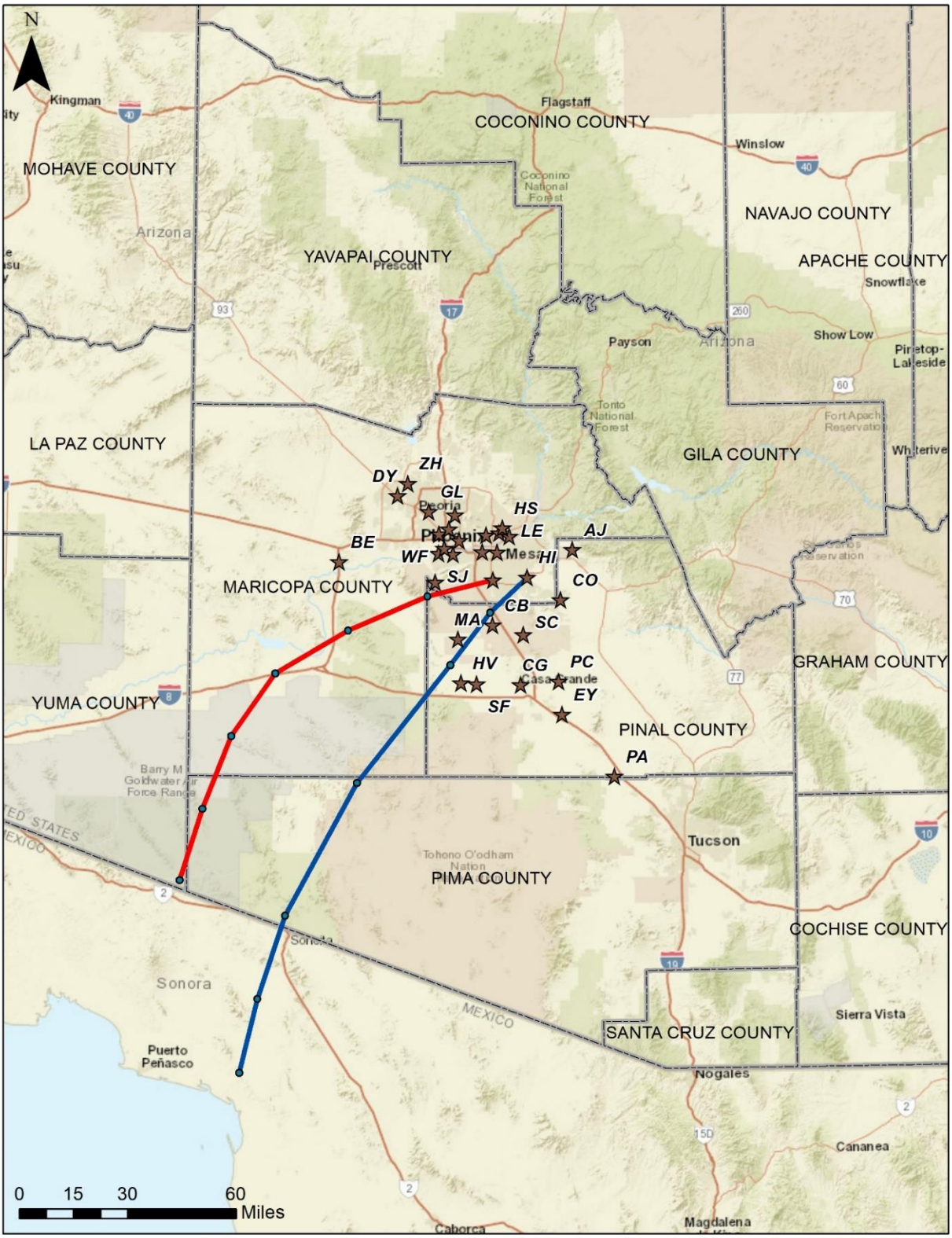


West Chandler PM_{10} Rose



HYSPLIT Back-Trajectory Analyses

Figure 7. HYSPLIT 6-hour back-trajectory ending at 12:00 a.m. on October 12, 2021, at both the Higley and West Chandler sites. Elevation at end time is 100 m AGL.



Proximity of Other Exceeding Sites to West Chandler and Higley

Note that both West Chandler and Higley exceeded the 24-hour PM_{10} NAAQS on this date.

- Higley
  - Closest exceeding site: West Chandler (9.5 miles away)
  - Farthest exceeding site: Pinal Air Park (60 miles away)
- West Chandler
  - Closest exceeding site: Mesa (7.8 miles away)
  - Farthest exceeding site: Eloy Pinal Air Park (64 miles away)

$PM_{10}/PM_{2.5}$ Ratios for Regional Air Monitors

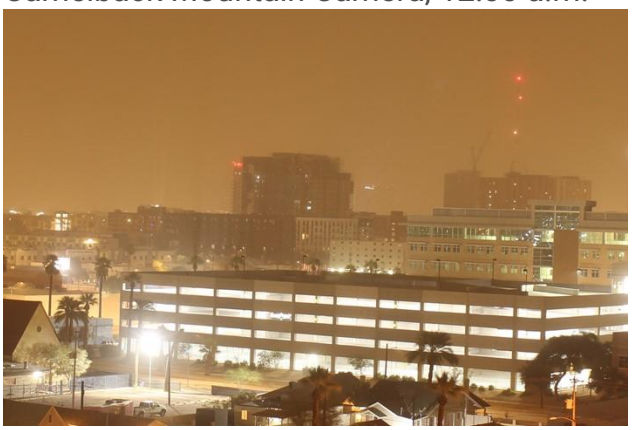
Table 15. Hourly-averaged PM_{10}, $PM_{2.5}$ and PM_C for sites in Maricopa and Pinal counties having a $PM_{2.5}$ monitor. Note that time reflects the hour of highest PM_{10} concentration on October 12, 2021.

Site	Time	PM_{10}	$PM_{2.5}$	PM_C	Ratio $PM_{2.5}/PM_{10}$
West Phoenix	12:00 a.m.	699.1	95.5	603.3	0.14
Mesa	12:00 a.m.	1018.0	144.4	872.9	0.14
North Phoenix	12:00 a.m.	738.6	96.4	641.9	0.13
Glendale	12:00 a.m.	710.6	106.0	604.6	0.15
South Phoenix	12:00 a.m.	857.4	106.6	744.9	0.12
Tempe	12:00 a.m.	953.8	160.0	793.6	0.17
Durango Complex	12:00 a.m.	914.7	102.6	811.6	0.11
JLG Supersite	12:00 a.m.	563	58	505	0.10
Casa Grande Downtown	12:00 a.m.	1836	198	1638	0.11
Hidden Valley	12:00 a.m.	1307	165	1142	0.13

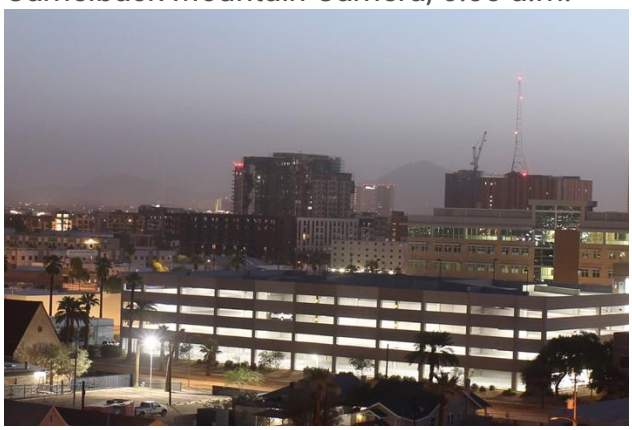
ADEQ Visibility Camera Historical Archive

Archived photos from ADEQ's Visibility Camera Historical Archive for October 12, 2021. The storm on this date began on October 11 before midnight, so the image on the left is at midnight during the storm and on the right is in the morning; the storm has passed, but dust is still lingering. Note: There are no images available in the archive for South Mountain or Superstition Mountain cameras on October 12, 2021.

Camelback Mountain Camera, 12:00 a.m.



Camelback Mountain Camera, 6:00 a.m.



Compliance and Enforcement Activities

An evaluation of all inspection reports and air quality complaints indicates no evidence of unusual anthropogenic PM_{10} emissions during the time period of October 9 through October 15, 2021.

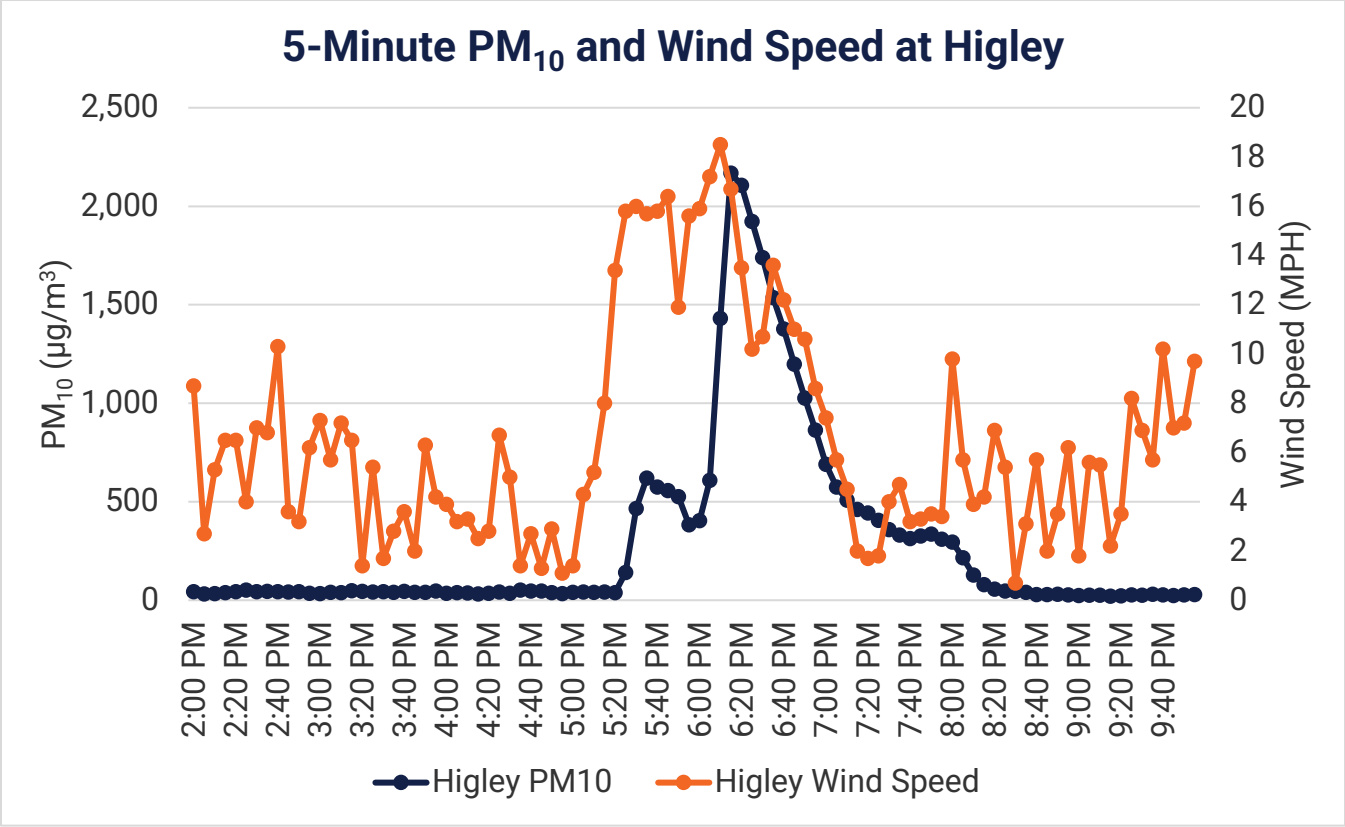
During this seven-day period the following activity took place:

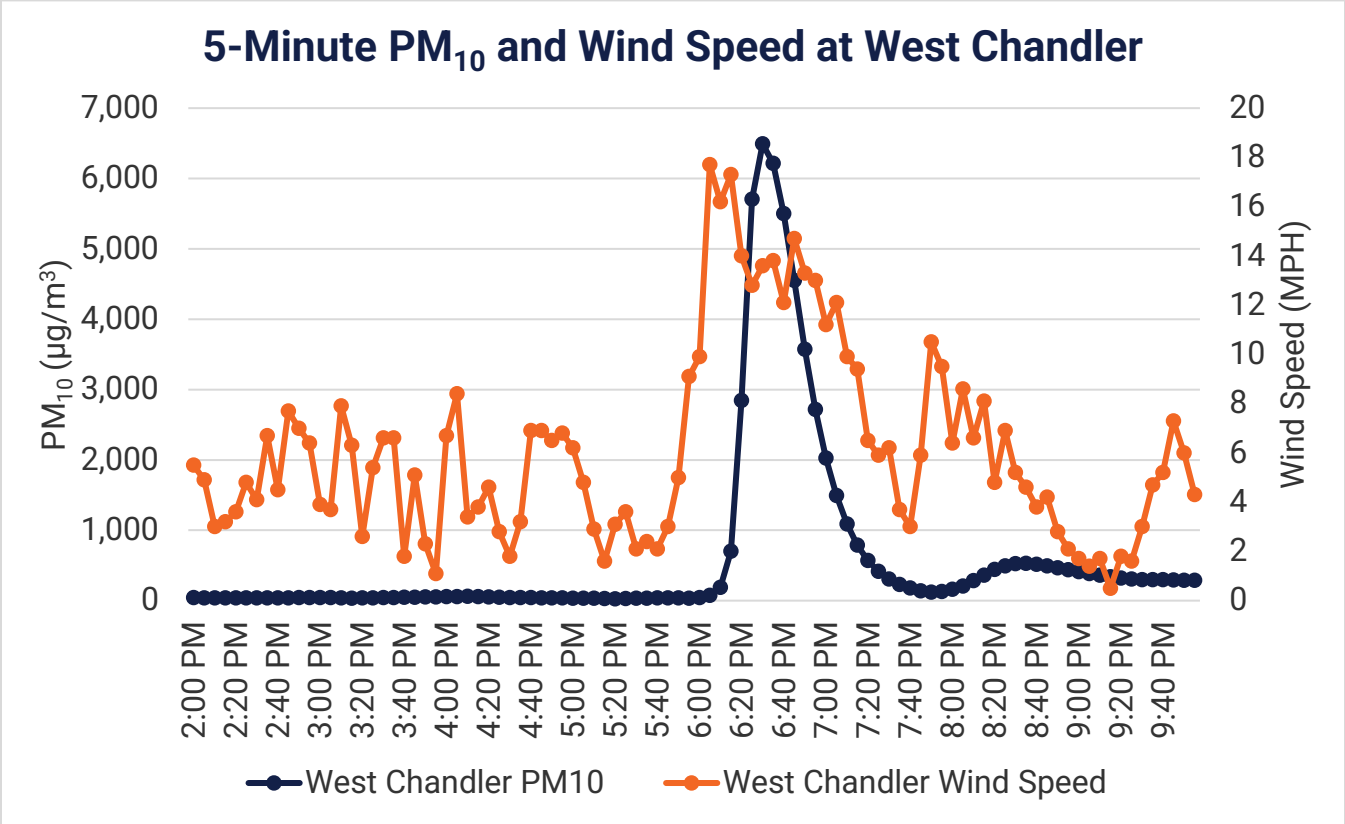
- Number of inspections of permitted facilities: 178
    - Number of those facilities that were fugitive dust sources: 132
- Number of inspections that resulted in an enforcement action taken for PM_{10} and non-PM_{10}-related violations: 31
    - Number of enforcement actions that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 1
    - Details on enforcement actions: The one violation that was noted during this inspection was for a recordkeeping error. Visible emissions of dust were not noted during this inspection.
- Number of complaints received: 22
    - Number of those complaints that were windblown dust or PM_{10} related: 14
    - Number of those complaints that occurred at facilities within a four-mile radius of the Higley or West Chandler monitoring sites: 0

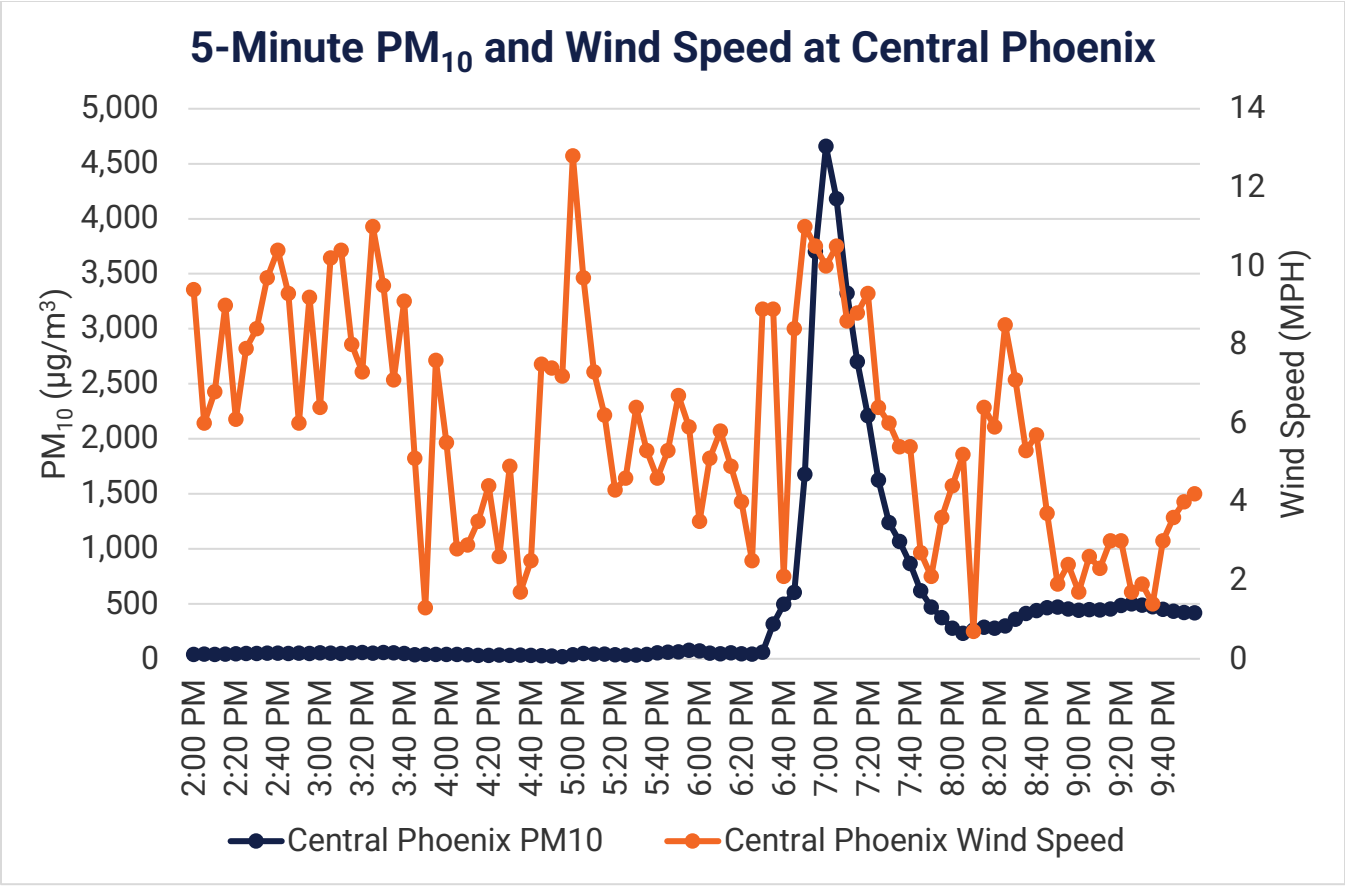
Appendix I

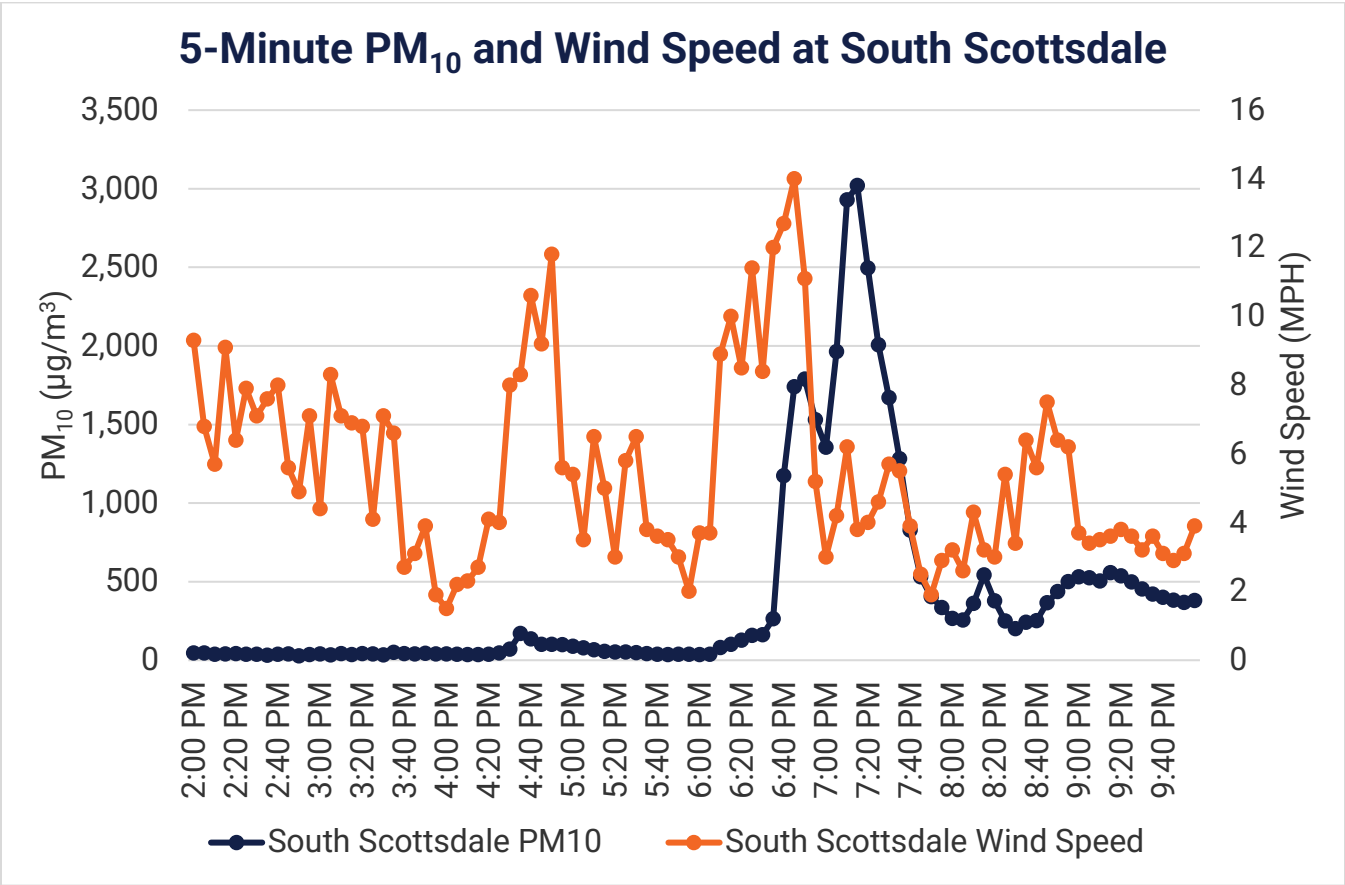
Charts of 5-minute and hourly PM_{10}, wind speed, and maximum wind gust for all atypical events listed in this report. Charts include the Higley and West Chandler sites as well as any sites that exceeded the 24-hour PM_{10} NAAQS for those dates.

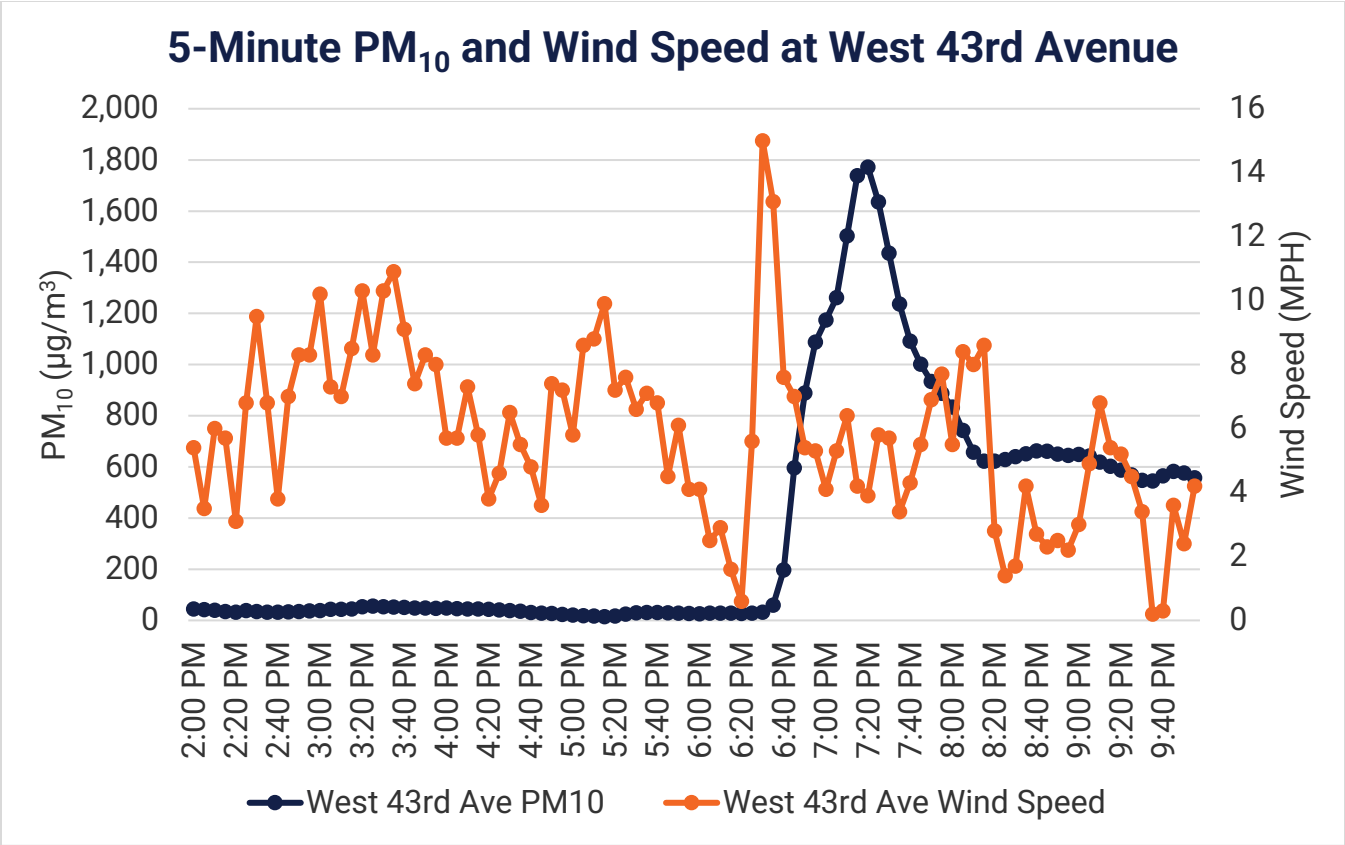
August 16, 2020

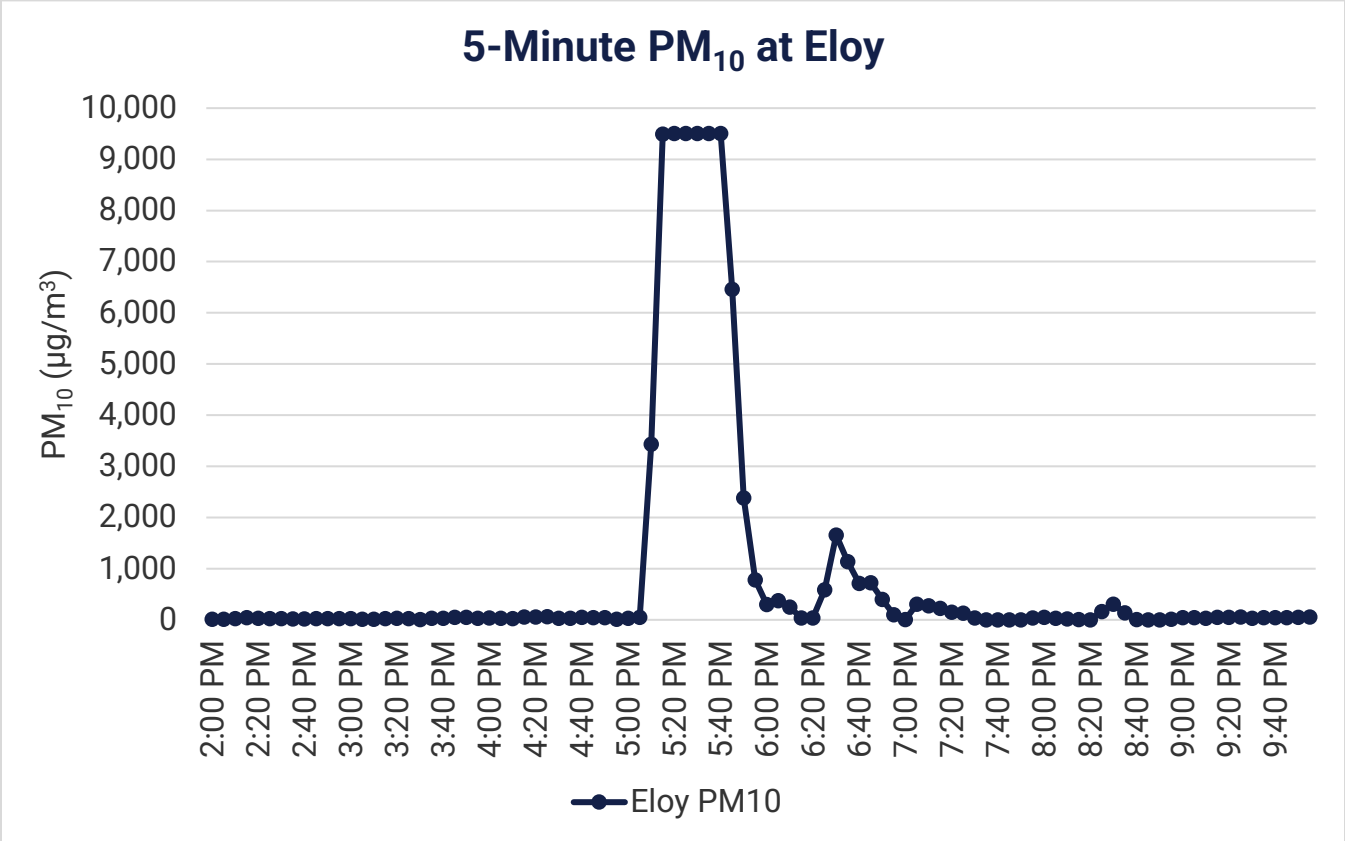




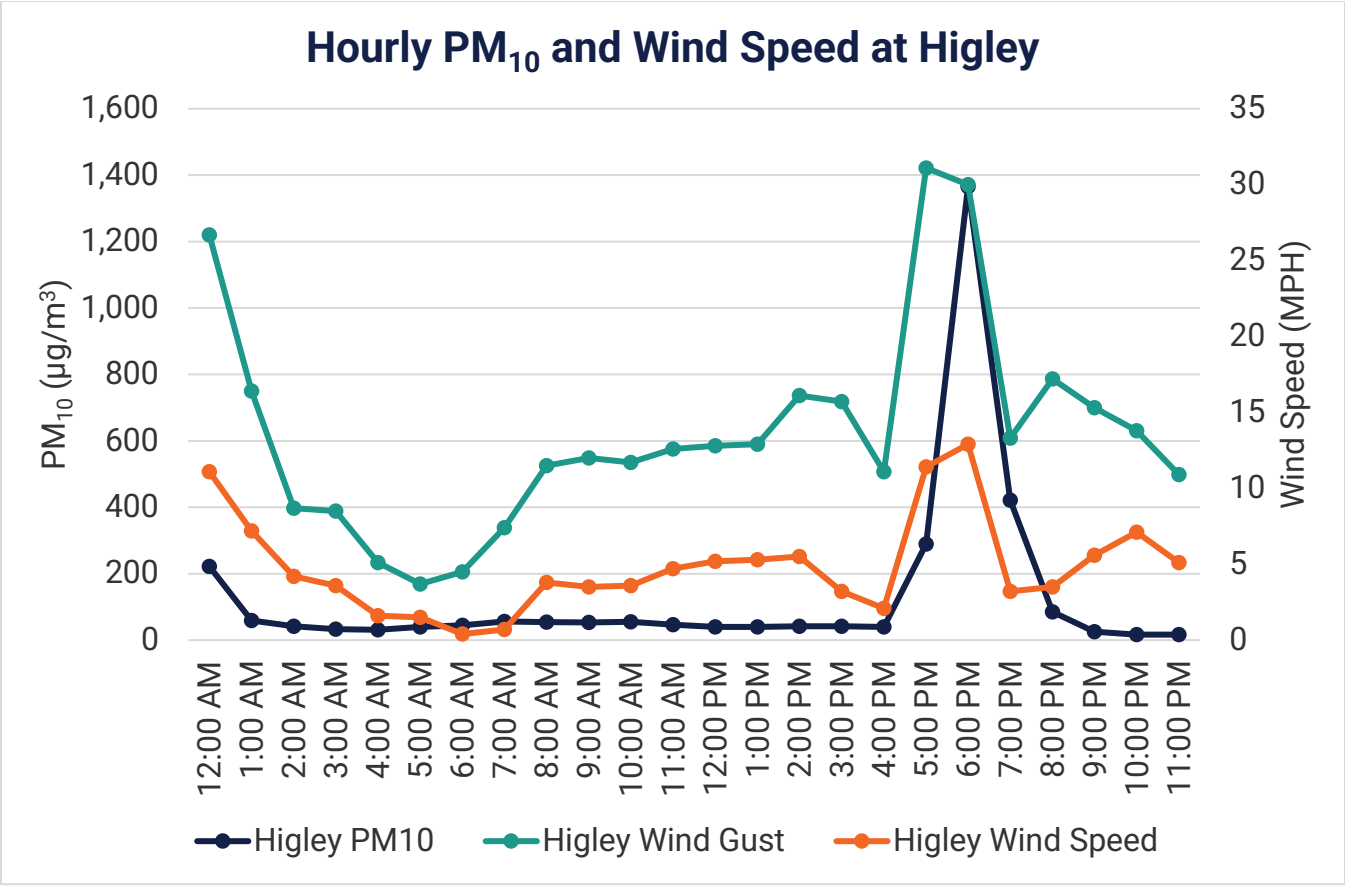

5-Minute PM10 and Wind Speed at Central Phoenix
PM10 (µg/m3)
Wind Speed (MPH)
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
14
12
10
8
6
4
2
0
2:00 PM
2:20 PM
2:40 PM
3:00 PM
3:20 PM
3:40 PM
4:00 PM
4:20 PM
4:40 PM
5:00 PM
5:20 PM
5:40 PM
6:00 PM
6:20 PM
6:40 PM
7:00 PM
7:20 PM
7:40 PM
8:00 PM
8:20 PM
8:40 PM
9:00 PM
9:20 PM
9:40 PM
Central Phoenix PM10
Central Phoenix Wind Speed

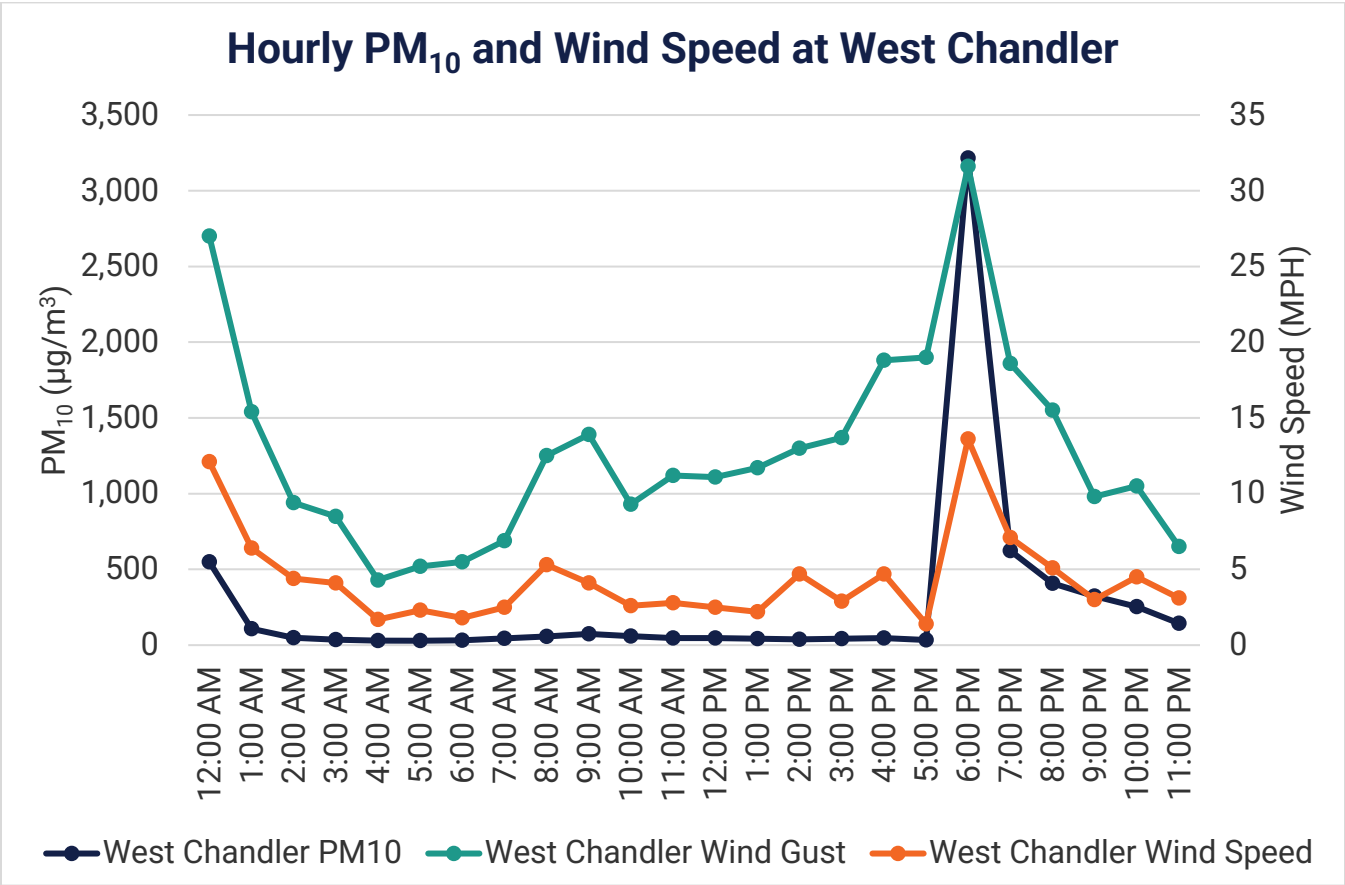

5-Minute PM10 and Wind Speed at South Scottsdale
PM10 (µg/m3)
Wind Speed (MPH)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
16
14
12
10
8
6
4
2
0
2:00 PM
2:20 PM
2:40 PM
3:00 PM
3:20 PM
3:40 PM
4:00 PM
4:20 PM
4:40 PM
5:00 PM
5:20 PM
5:40 PM
6:00 PM
6:20 PM
6:40 PM
7:00 PM
7:20 PM
7:40 PM
8:00 PM
8:20 PM
8:40 PM
9:00 PM
9:20 PM
9:40 PM
South Scottsdale PM10
South Scottsdale Wind Speed

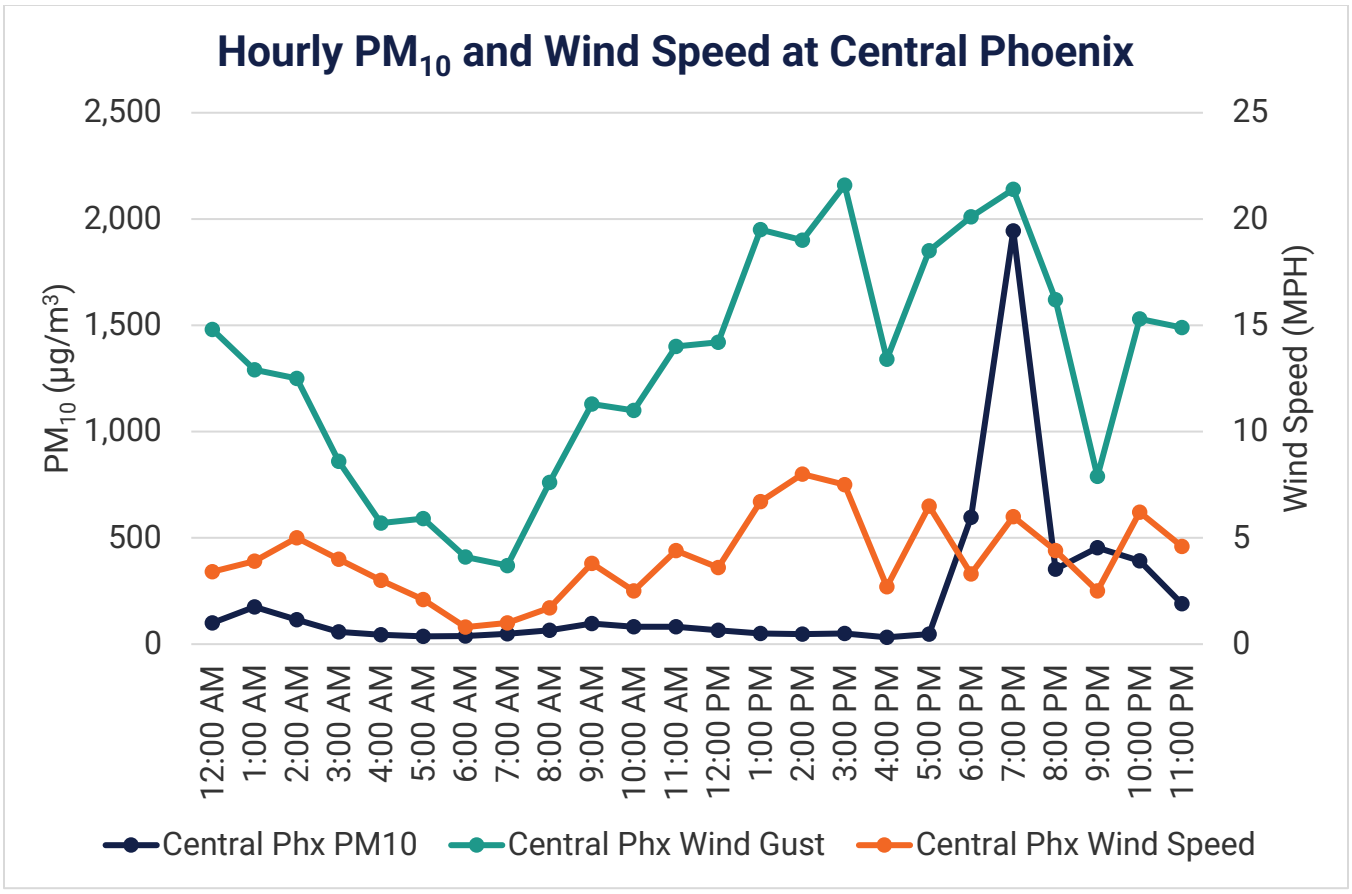


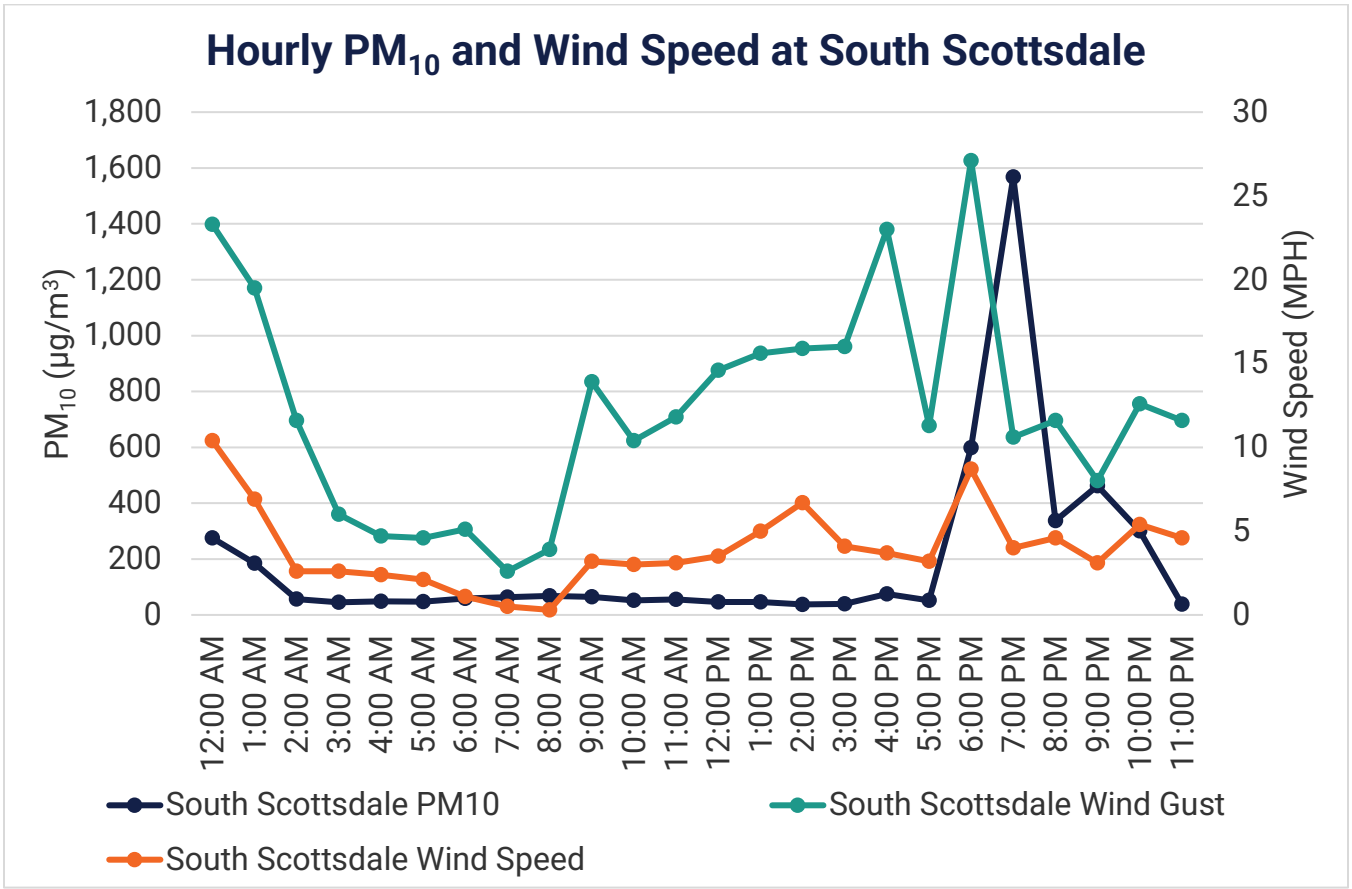


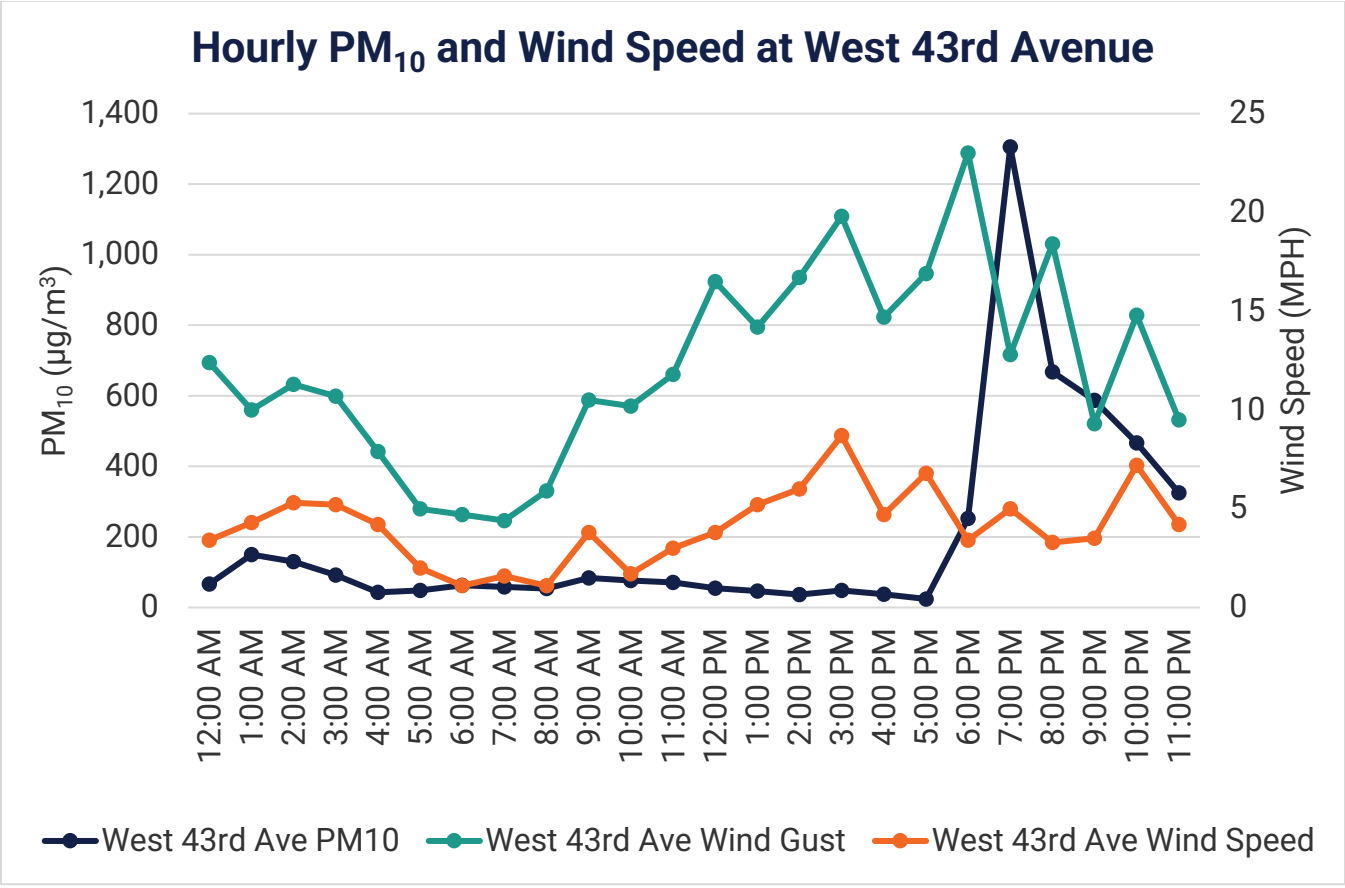
Note: Hourly average at Eloy for 5:00 p.m. on August 16, 2020, was 28,161 µg/m^3; 5-minute readings appear to be machine limited to 9504 µg/m^3.

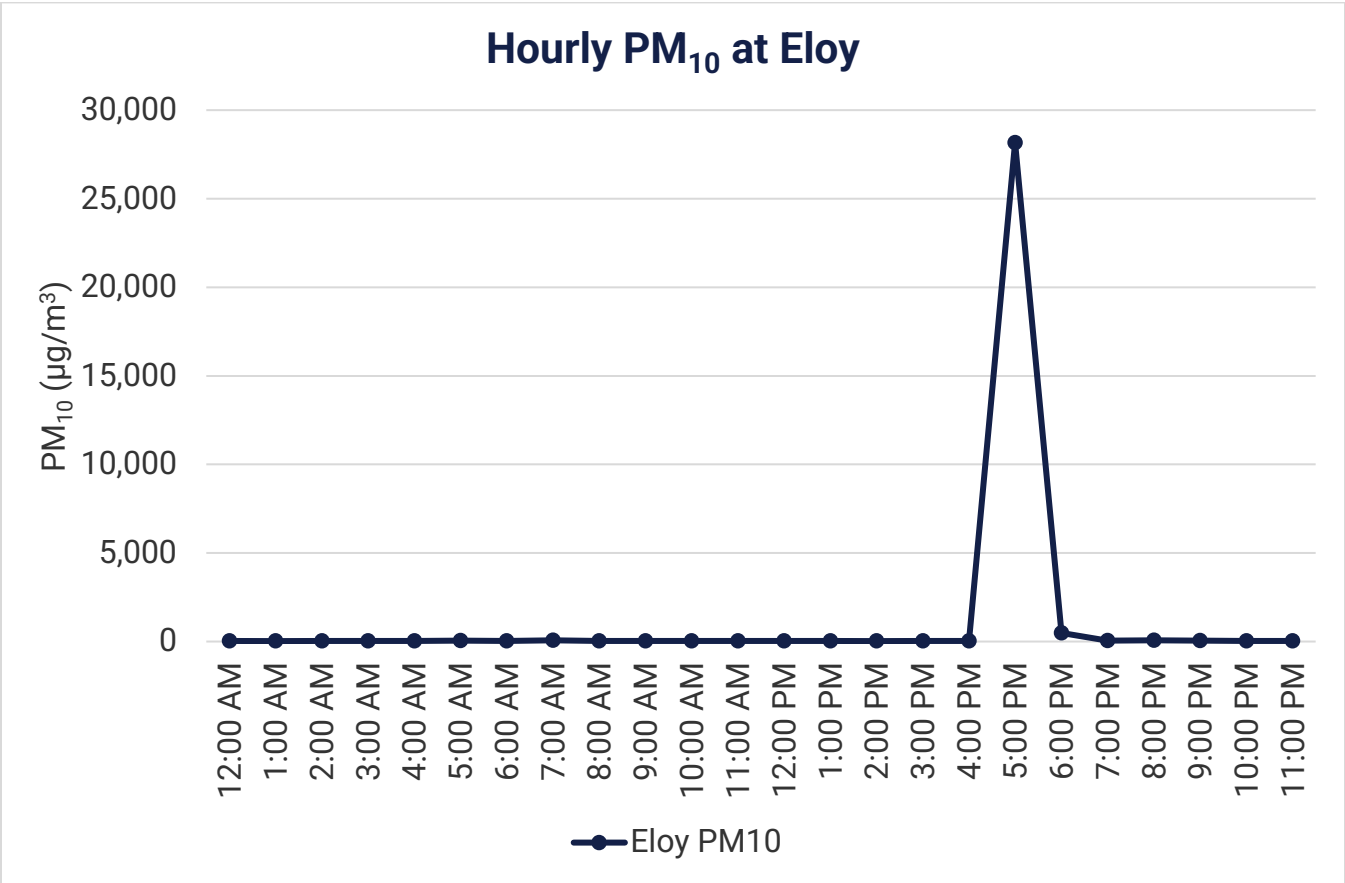

Hourly PM10 and Wind Speed at Higley
PM10 (µg/m3)
Wind Speed (MPH)
1,600
1,400
1,200
1,000
800
600
400
200
0
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Higley PM10
Higley Wind Gust
Higley Wind Speed


Hourly PM10 and Wind Speed at West Chandler
PM10 (µg/m3)
Wind Speed (MPH)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
West Chandler PM10
West Chandler Wind Gust
West Chandler Wind Speed

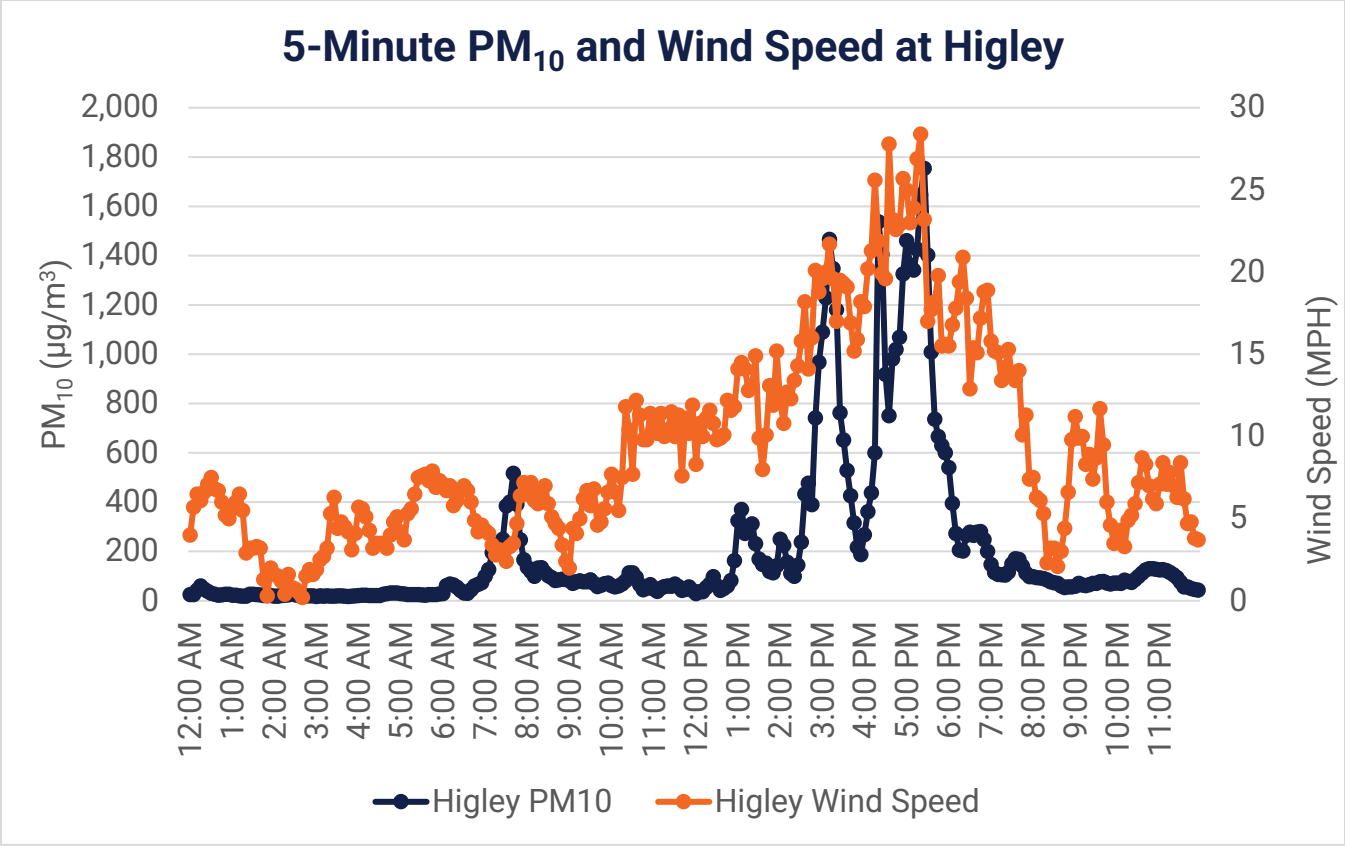

Hourly PM10 and Wind Speed at Central Phoenix
2,500
2,000
1,500
1,000
500
0
PM10 (µg/m3)
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Central Phx PM10
Central Phx Wind Gust
Central Phx Wind Speed

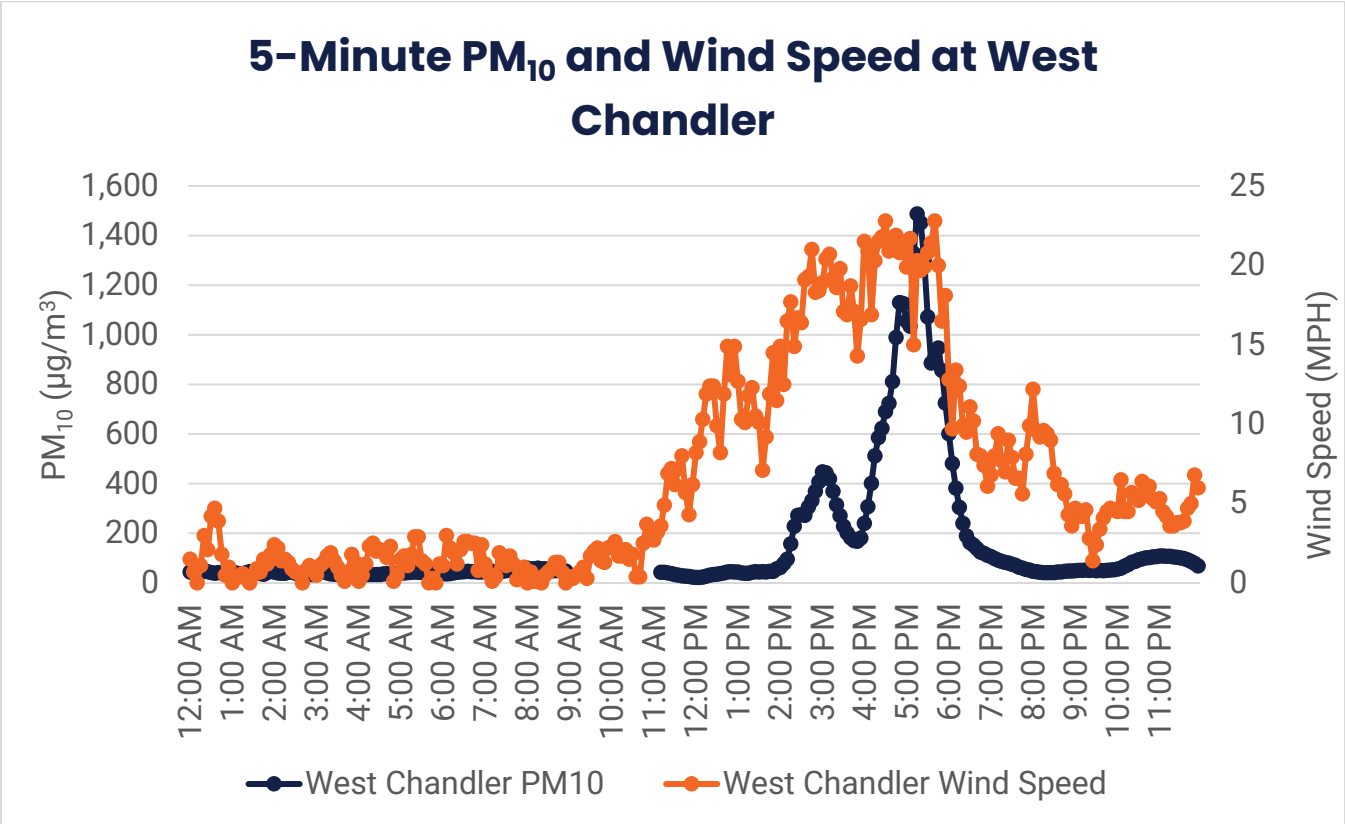

Hourly PM10 and Wind Speed at South Scottsdale
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
South Scottsdale PM10
South Scottsdale Wind Gust
South Scottsdale Wind Speed

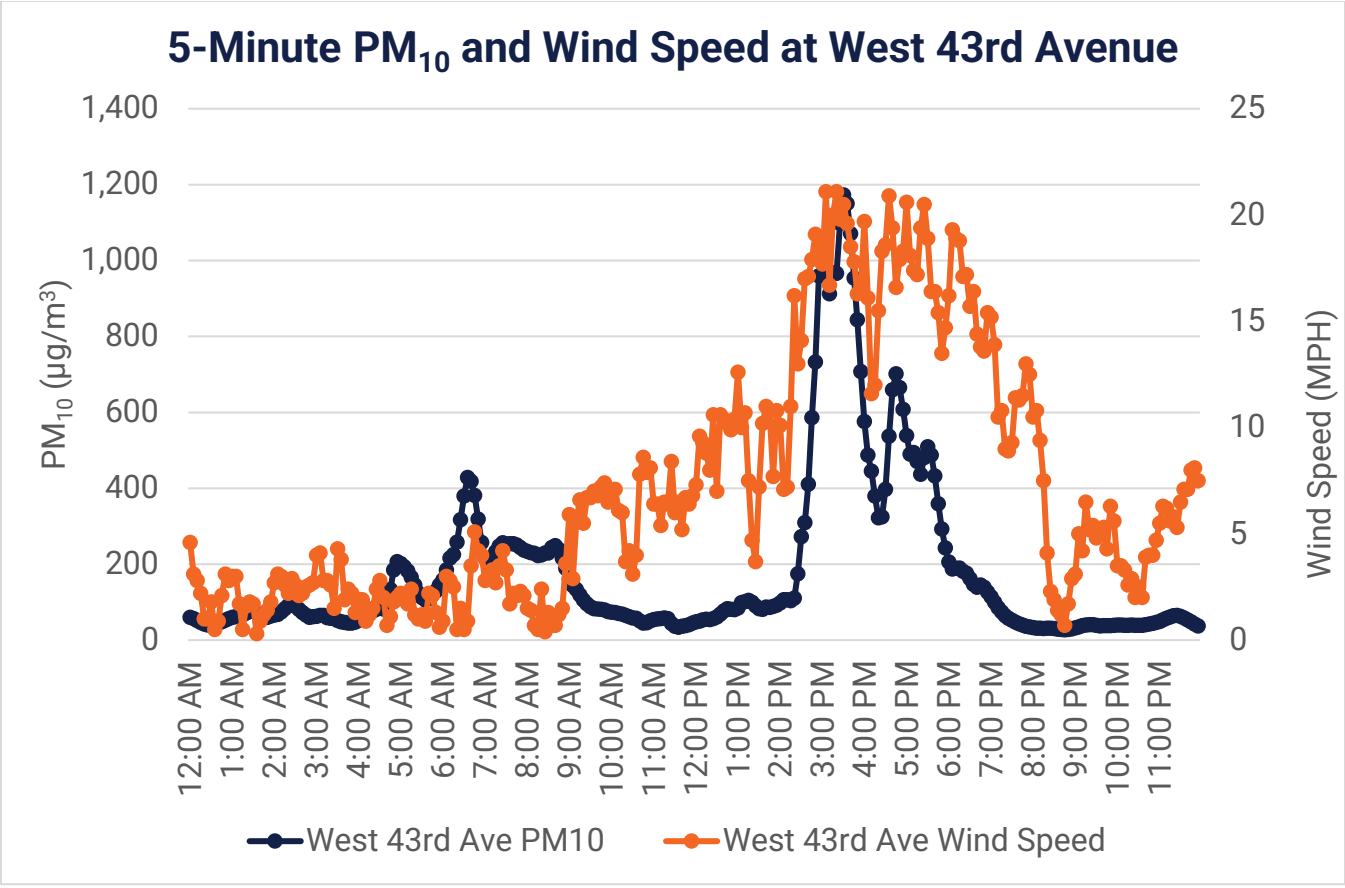

Hourly PM10 and Wind Speed at West 43rd Avenue
1,400
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
West 43rd Ave PM10
West 43rd Ave Wind Gust
West 43rd Ave Wind Speed

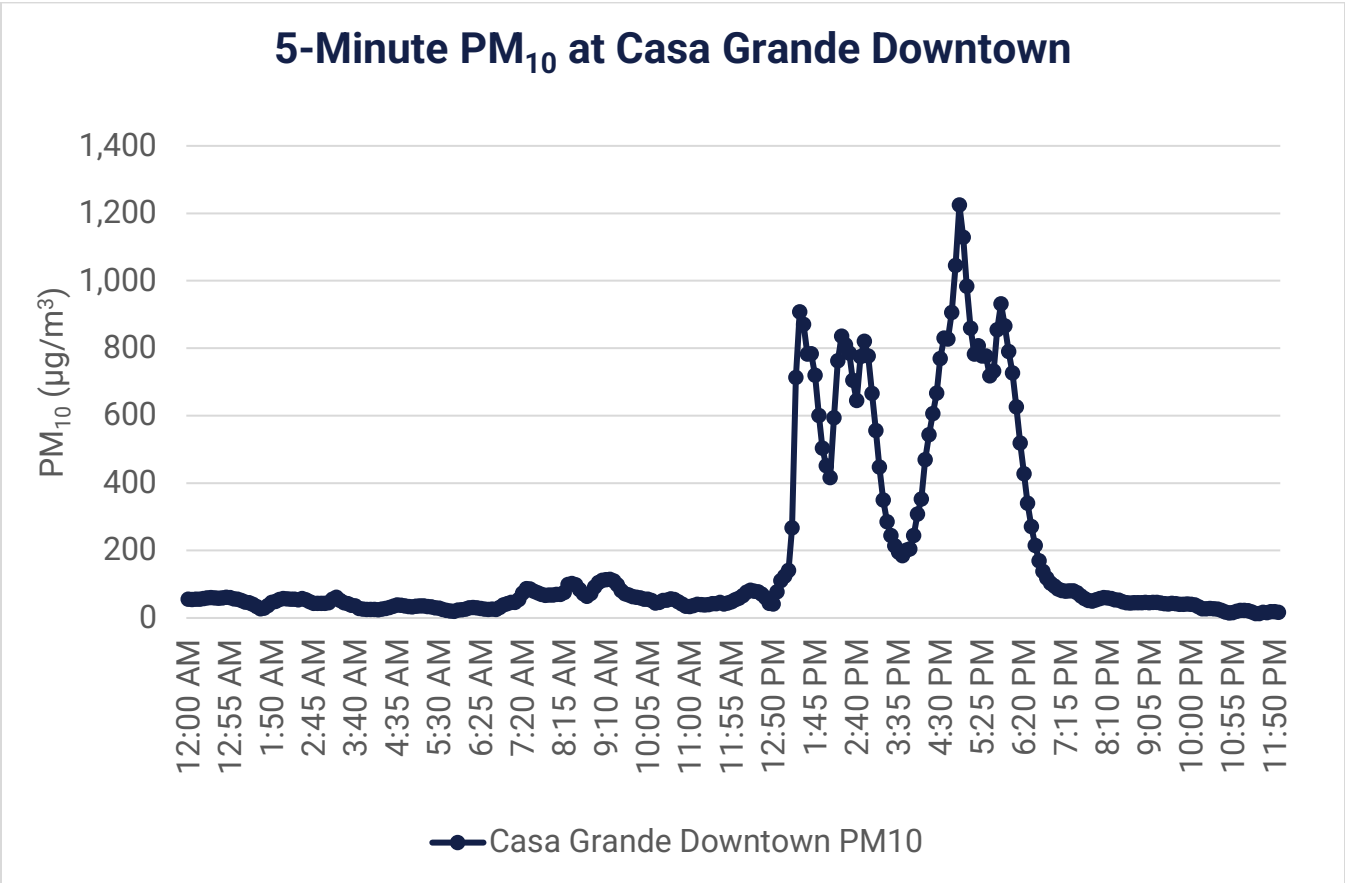

Hourly PM10 at Eloy
30,000
25,000
20,000
15,000
10,000
5,000
0
PM10 (µg/m3)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Eloy PM10

March 3, 2021

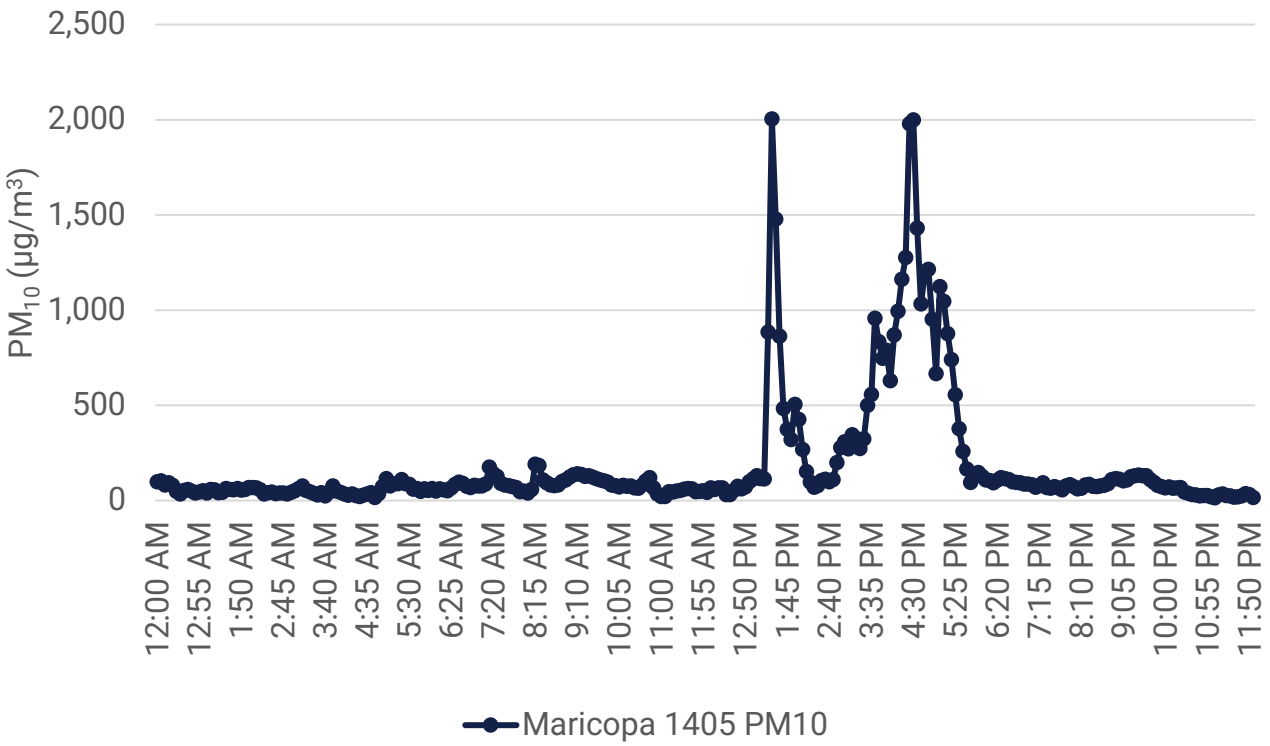

5-Minute PM10 and Wind Speed at Higley
PM10 (µg/m3)
Wind Speed (MPH)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Higley PM10
Higley Wind Speed


5-Minute PM10 and Wind Speed at West Chandler
PM10 (µg/m3)
Wind Speed (MPH)
1,600
1,400
1,200
1,000
800
600
400
200
0
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
West Chandler PM10
West Chandler Wind Speed

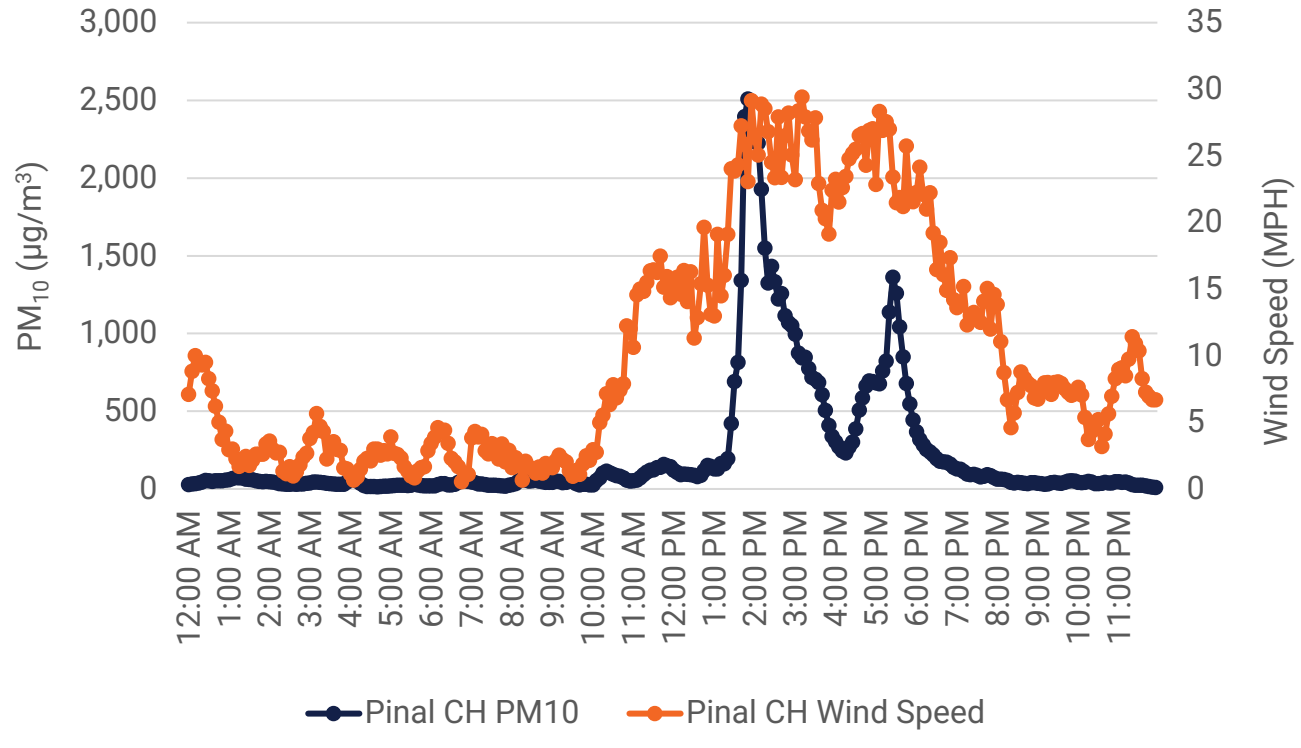

5-Minute PM10 and Wind Speed at West 43rd Avenue
PM10 (µg/m3)
Wind Speed (MPH)
1,400
1,200
1,000
800
600
400
200
0
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
West 43rd Ave PM10
West 43rd Ave Wind Speed

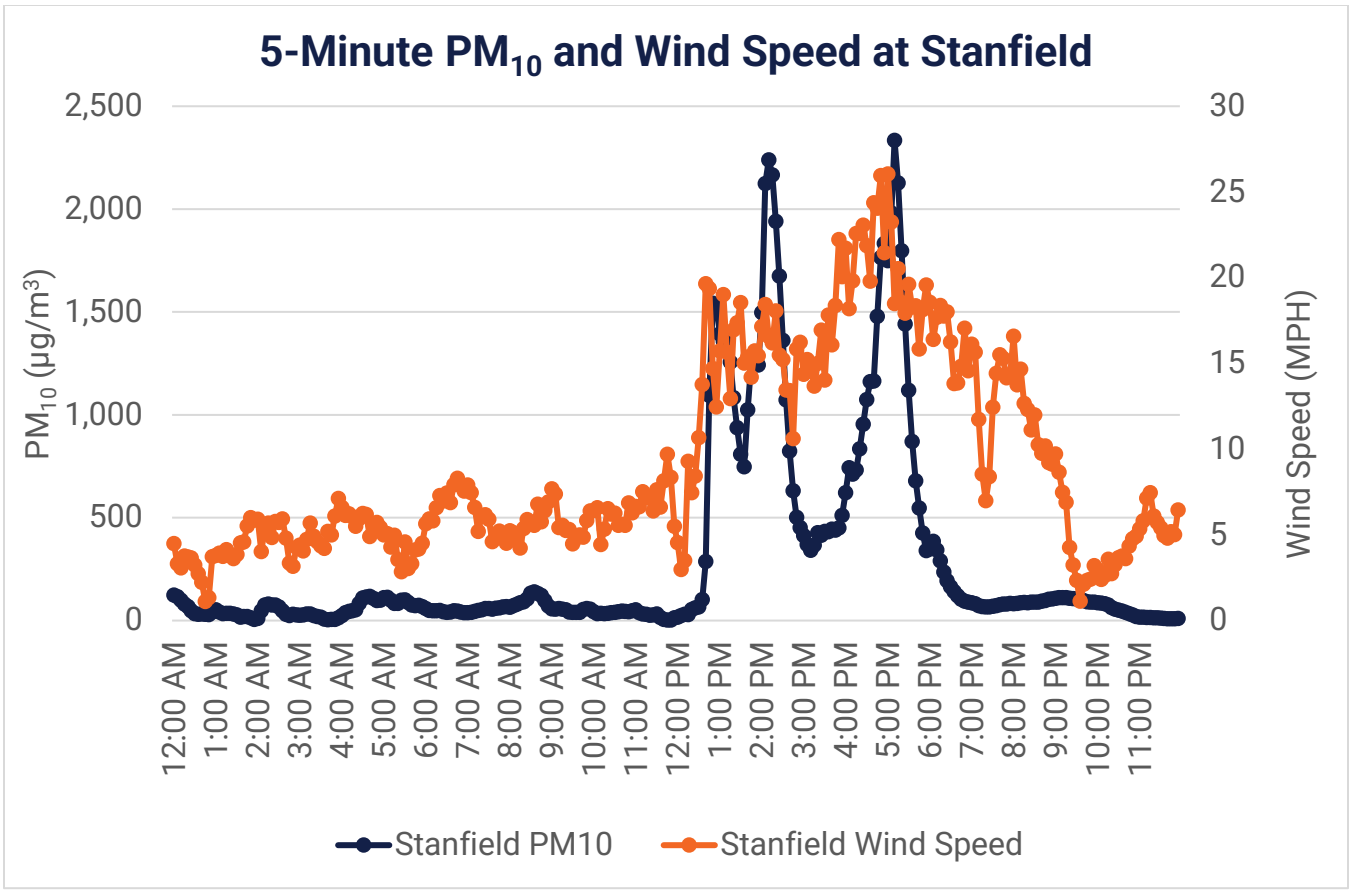

5-Minute PM10 at Casa Grande Downtown
PM10 (µg/m3)
1,400
1,200
1,000
800
600
400
200
0
12:00 AM
12:55 AM
1:50 AM
2:45 AM
3:40 AM
4:35 AM
5:30 AM
6:25 AM
7:20 AM
8:15 AM
9:10 AM
10:05 AM
11:00 AM
11:55 AM
12:50 PM
1:45 PM
2:40 PM
3:35 PM
4:30 PM
5:25 PM
6:20 PM
7:15 PM
8:10 PM
9:05 PM
10:00 PM
10:55 PM
11:50 PM
Casa Grande Downtown PM10

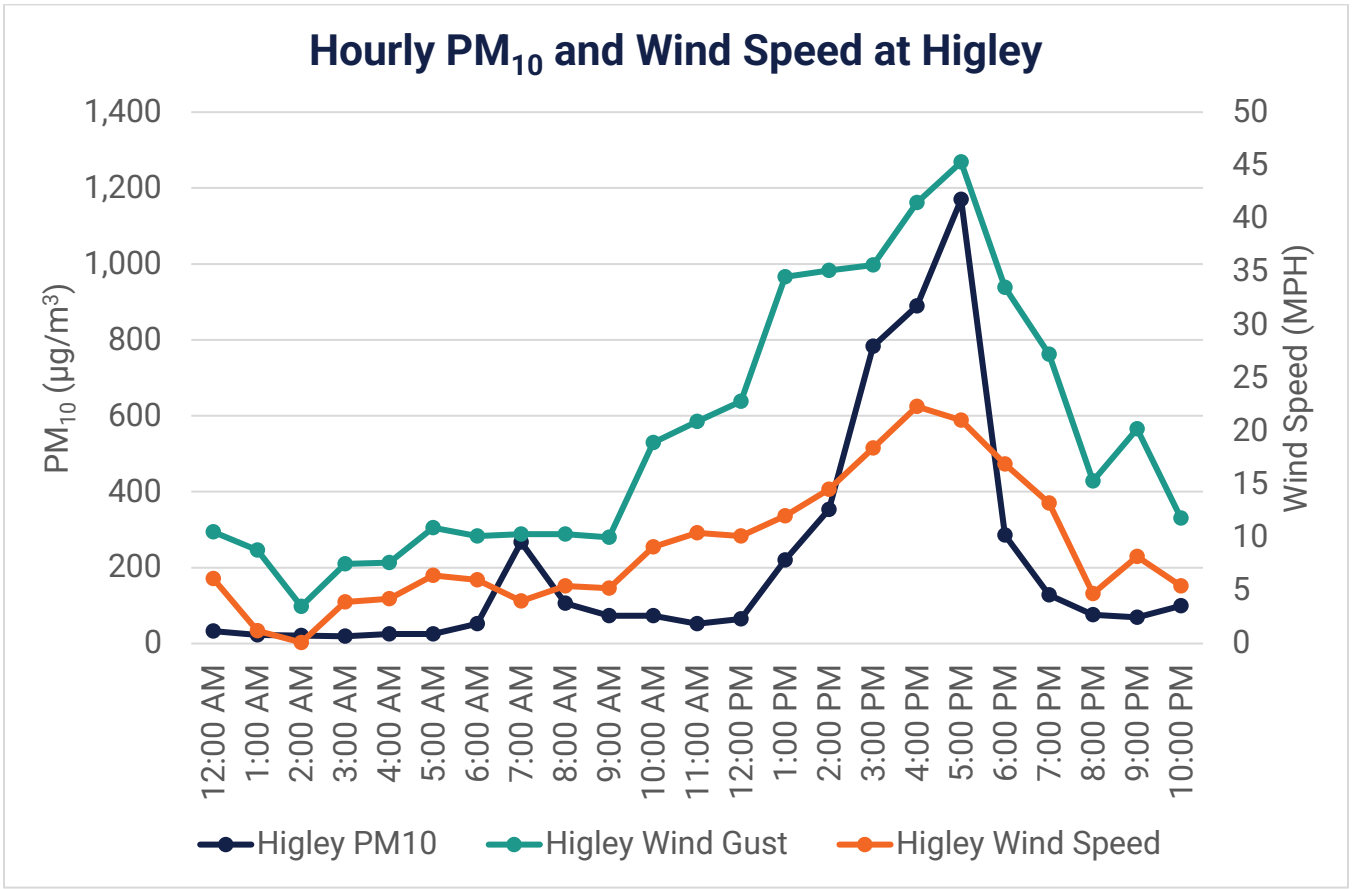
5-Minute PM_{10} at Maricopa 1405

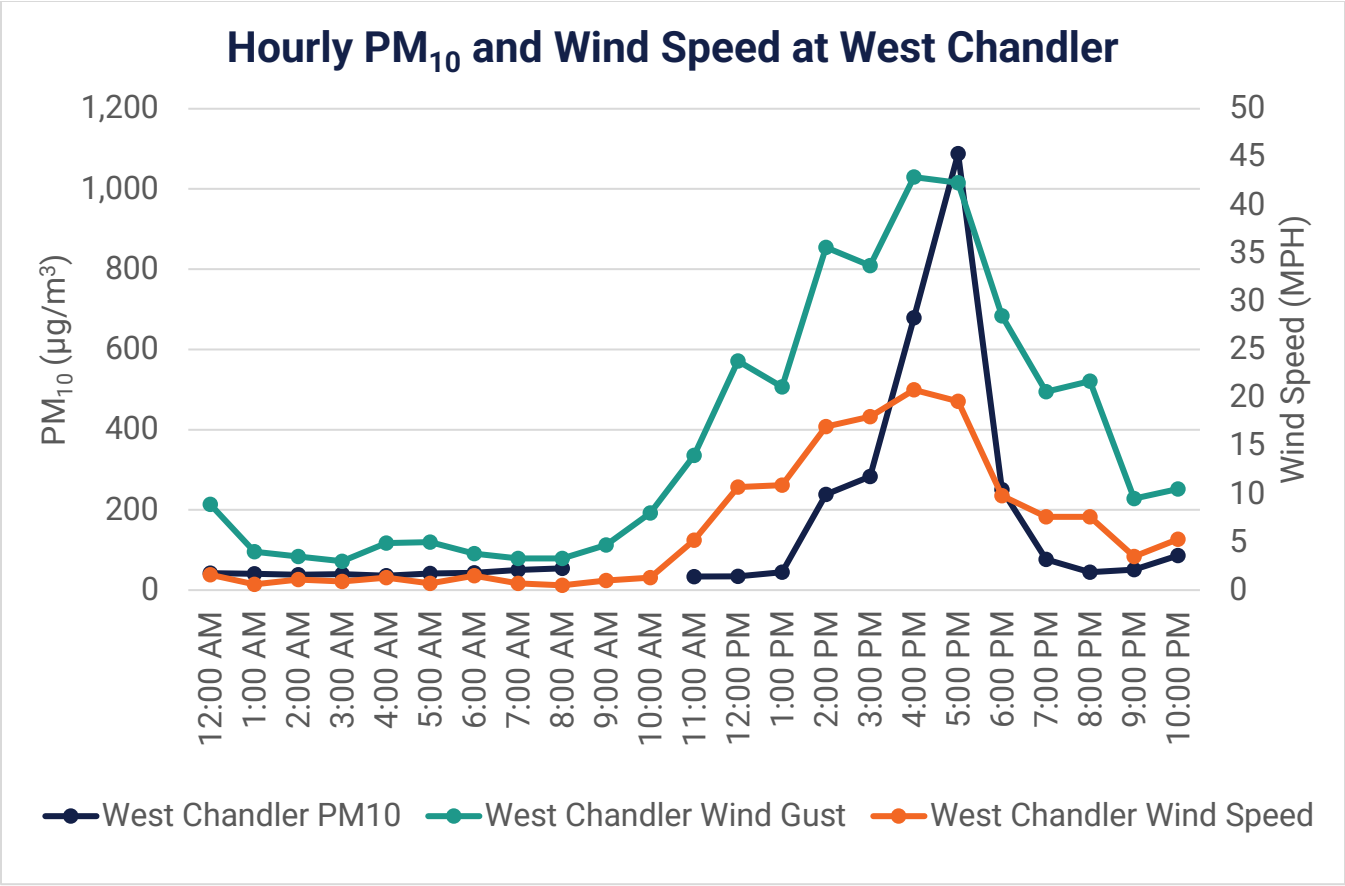


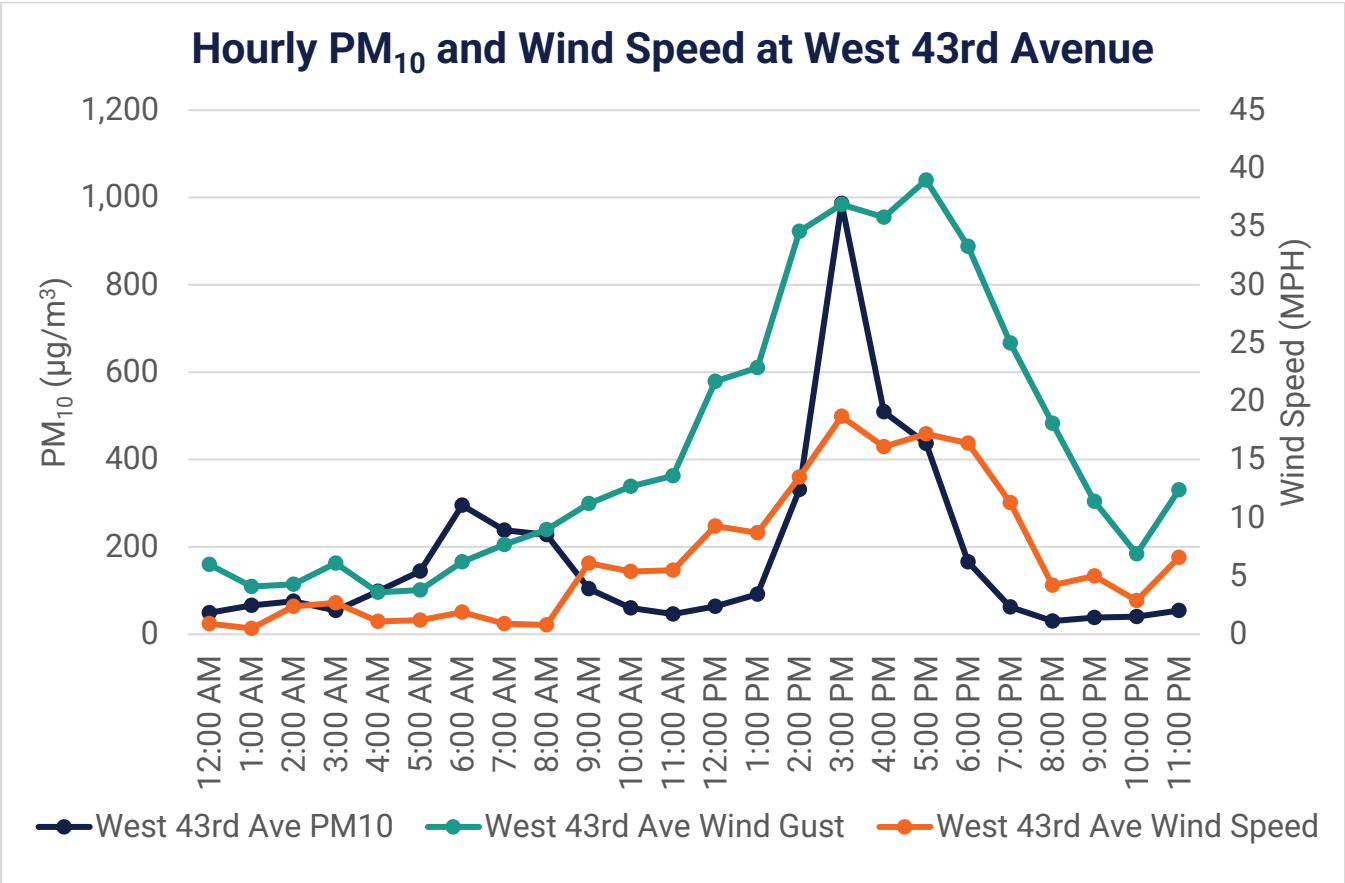
5-Minute PM_{10} and Wind Speed at Pinal County Housing

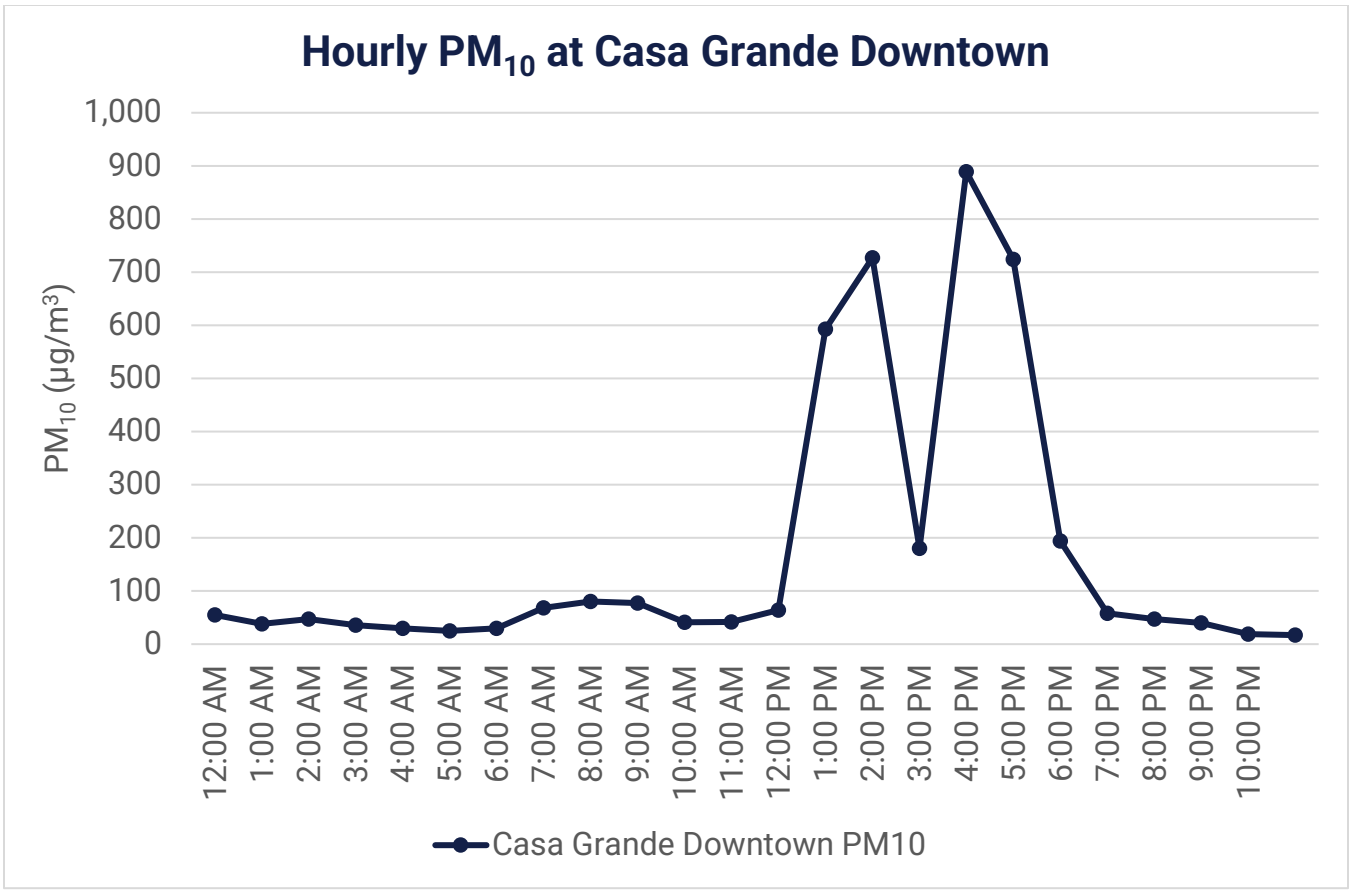


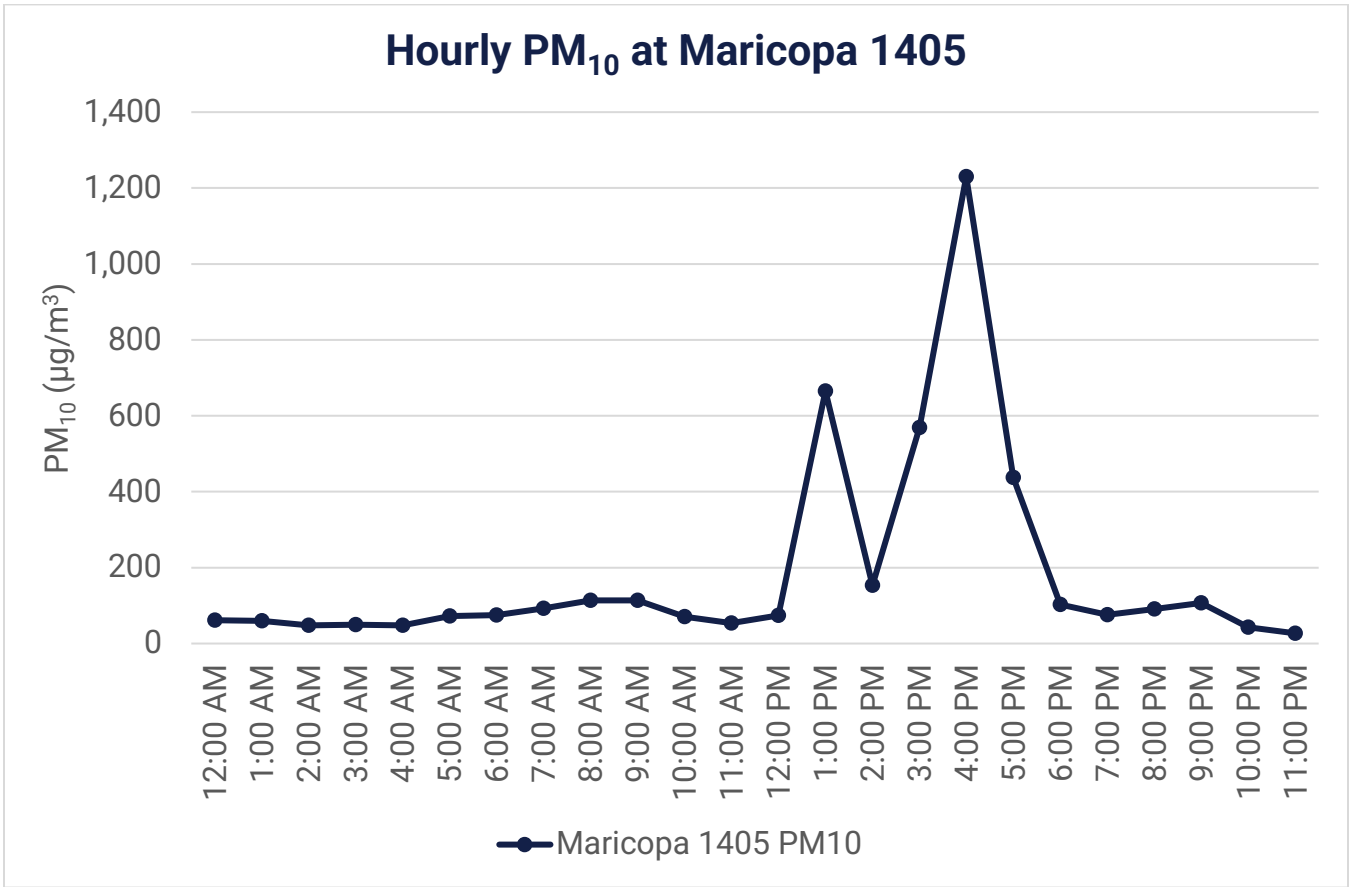

5-Minute PM10 and Wind Speed at Stanfield
2,500
2,000
1,500
1,000
500
0
PM10 (µg/m3)
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Stanfield PM10
Stanfield Wind Speed

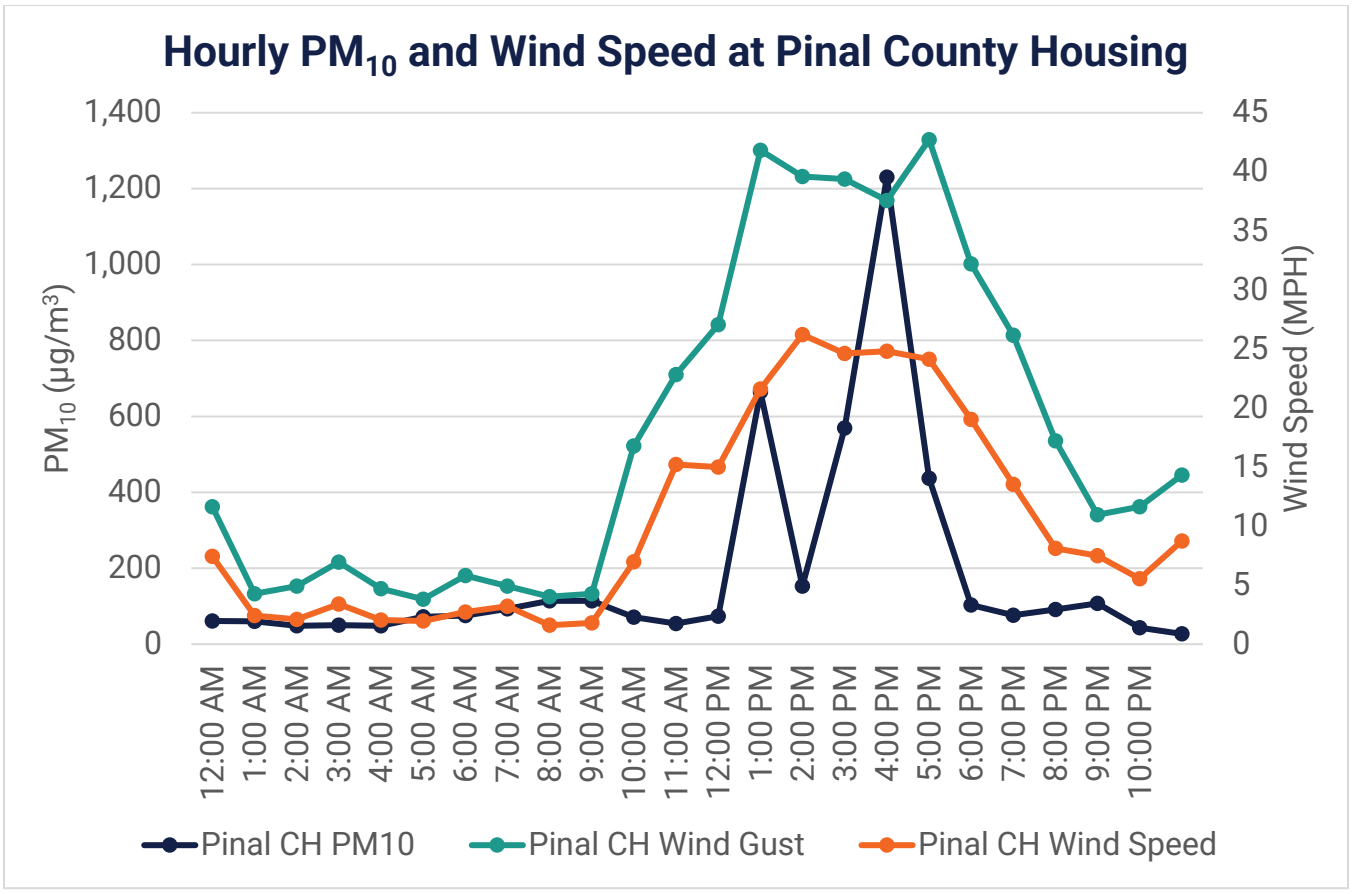

Hourly PM10 and Wind Speed at Higley
1,400
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
50
45
40
35
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
Higley PM10
Higley Wind Gust
Higley Wind Speed

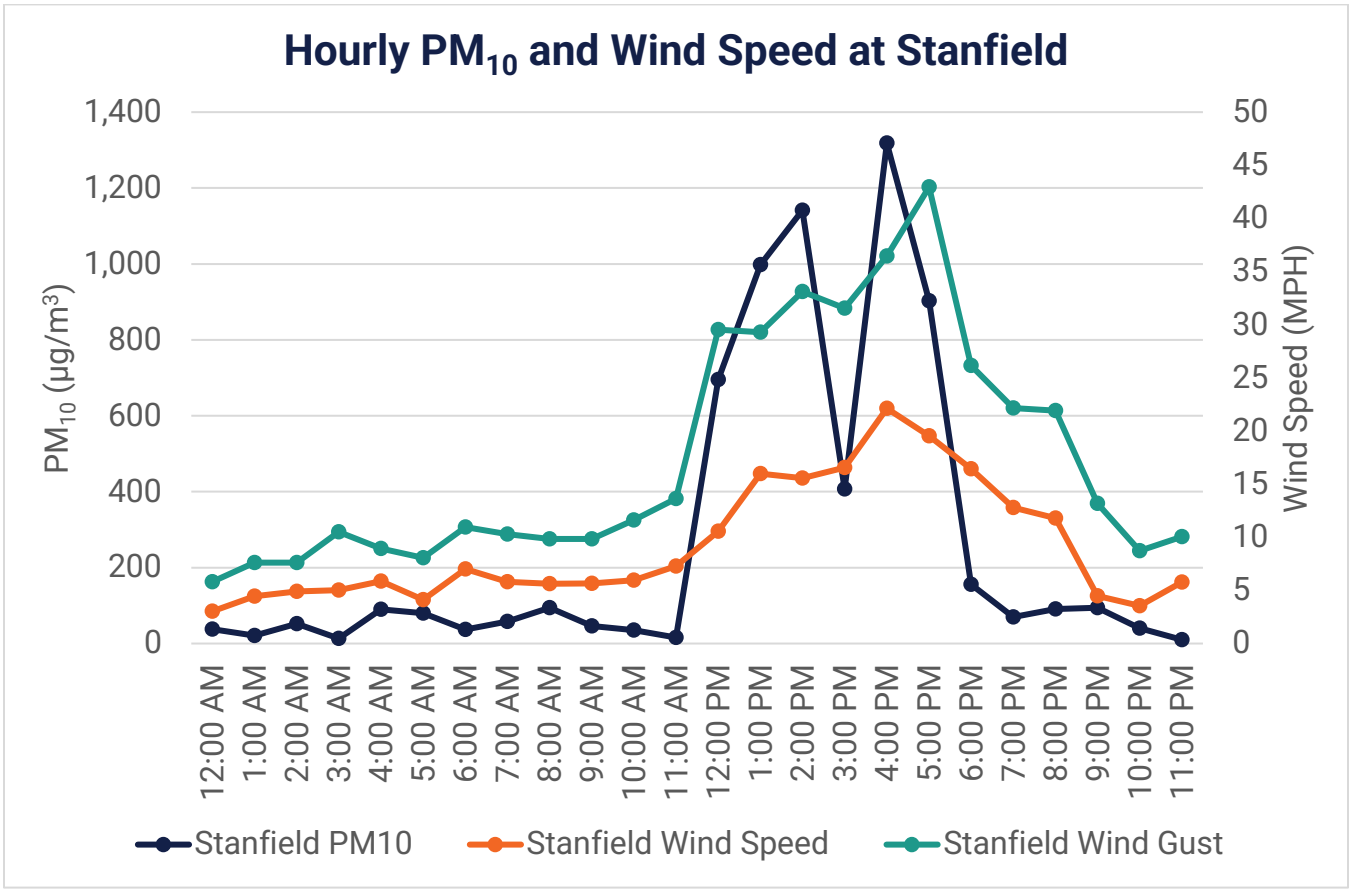

Hourly PM10 and Wind Speed at West Chandler
PM10 (µg/m3)
Wind Speed (MPH)
1,200
1,000
800
600
400
200
0
50
45
40
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
West Chandler PM10
West Chandler Wind Gust
West Chandler Wind Speed


Hourly PM10 and Wind Speed at West 43rd Avenue
PM10 (µg/m3)
Wind Speed (MPH)
1,200
1,000
800
600
400
200
0
45
40
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
West 43rd Ave PM10
West 43rd Ave Wind Gust
West 43rd Ave Wind Speed

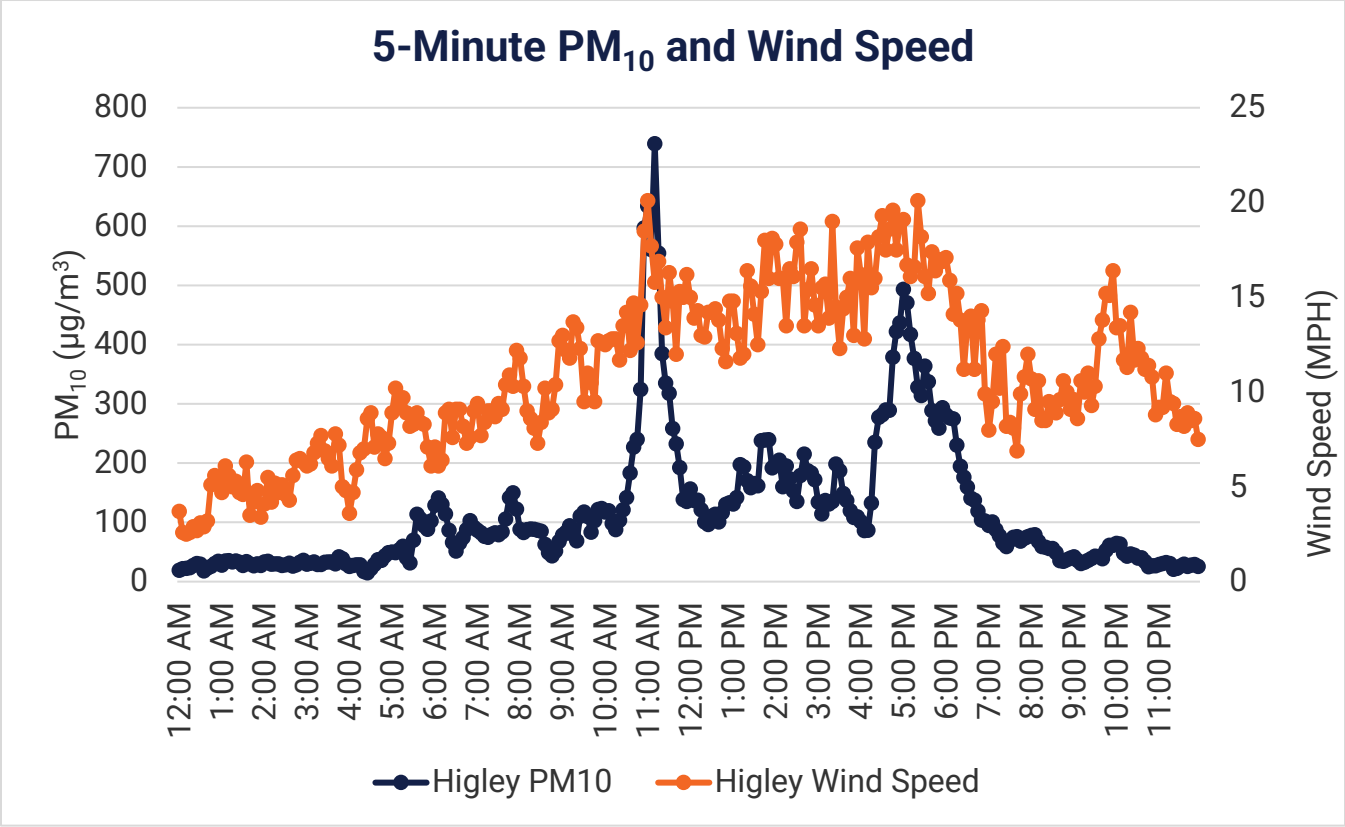

Hourly PM10 at Casa Grande Downtown
1,000
900
800
700
600
500
400
300
200
100
0
PM10 (µg/m3)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
Casa Grande Downtown PM10

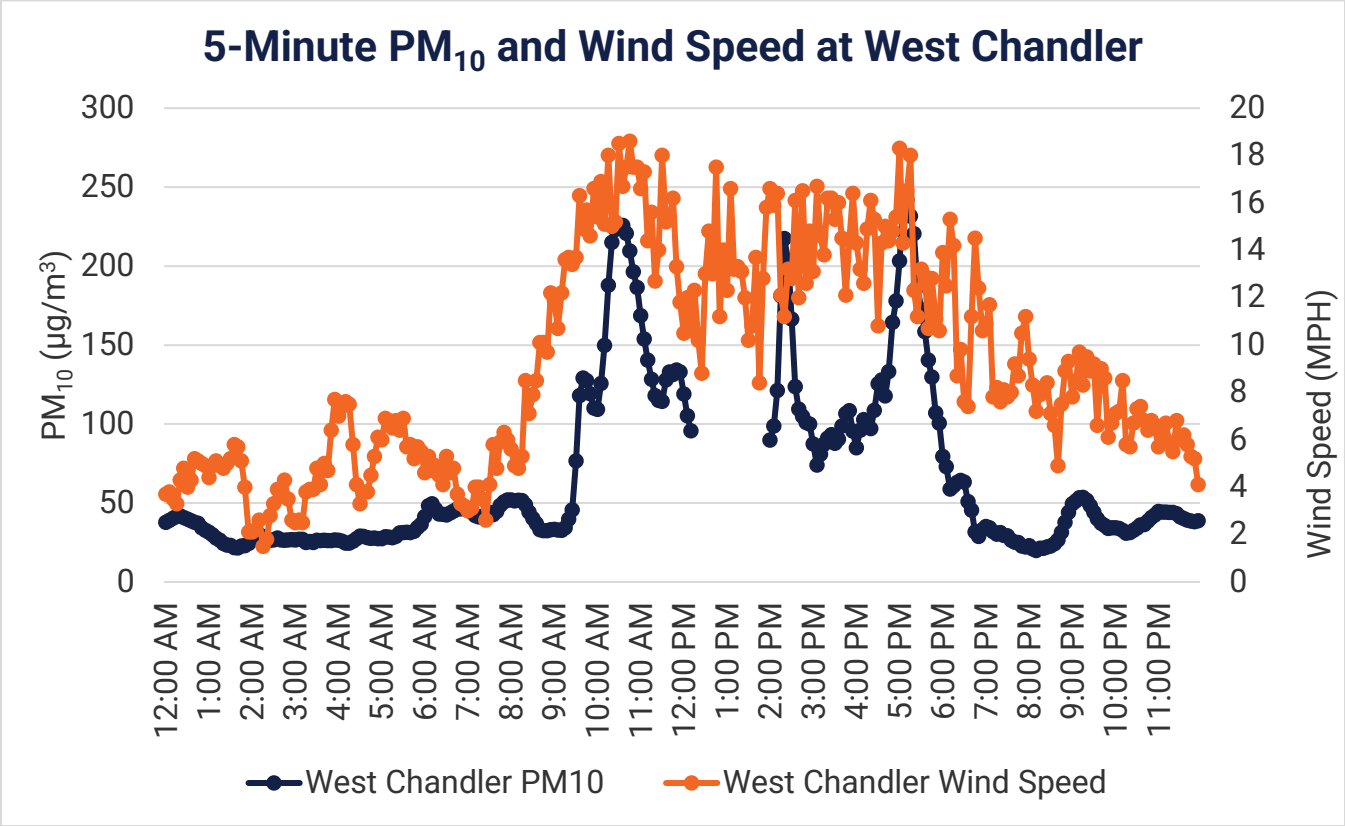

Hourly PM10 at Maricopa 1405
1,400
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Maricopa 1405 PM10

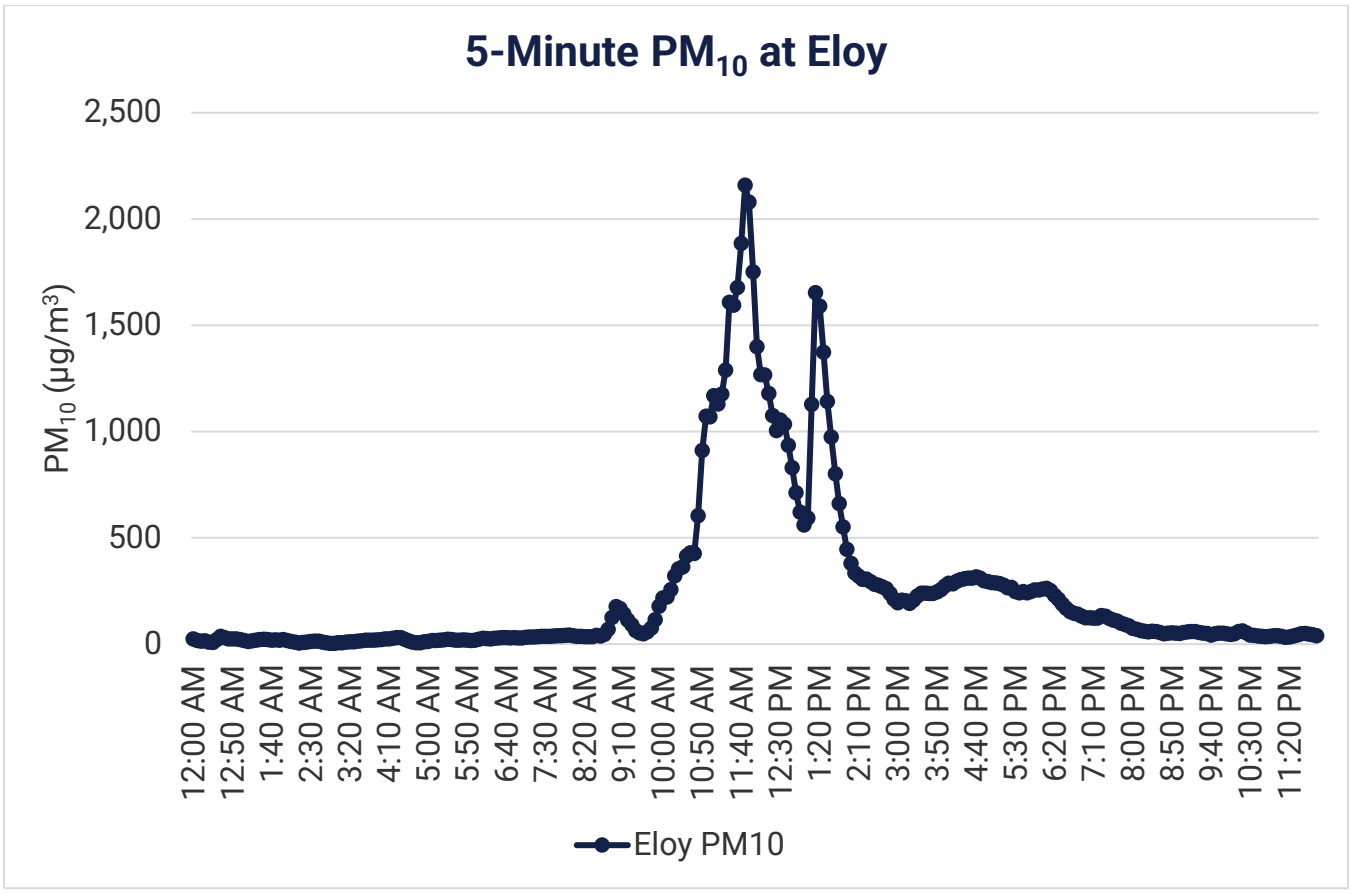

Hourly PM10 and Wind Speed at Pinal County Housing
PM10 (µg/m3)
Wind Speed (MPH)
1,400
1,200
1,000
800
600
400
200
0
45
40
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
Pinal CH PM10
Pinal CH Wind Gust
Pinal CH Wind Speed

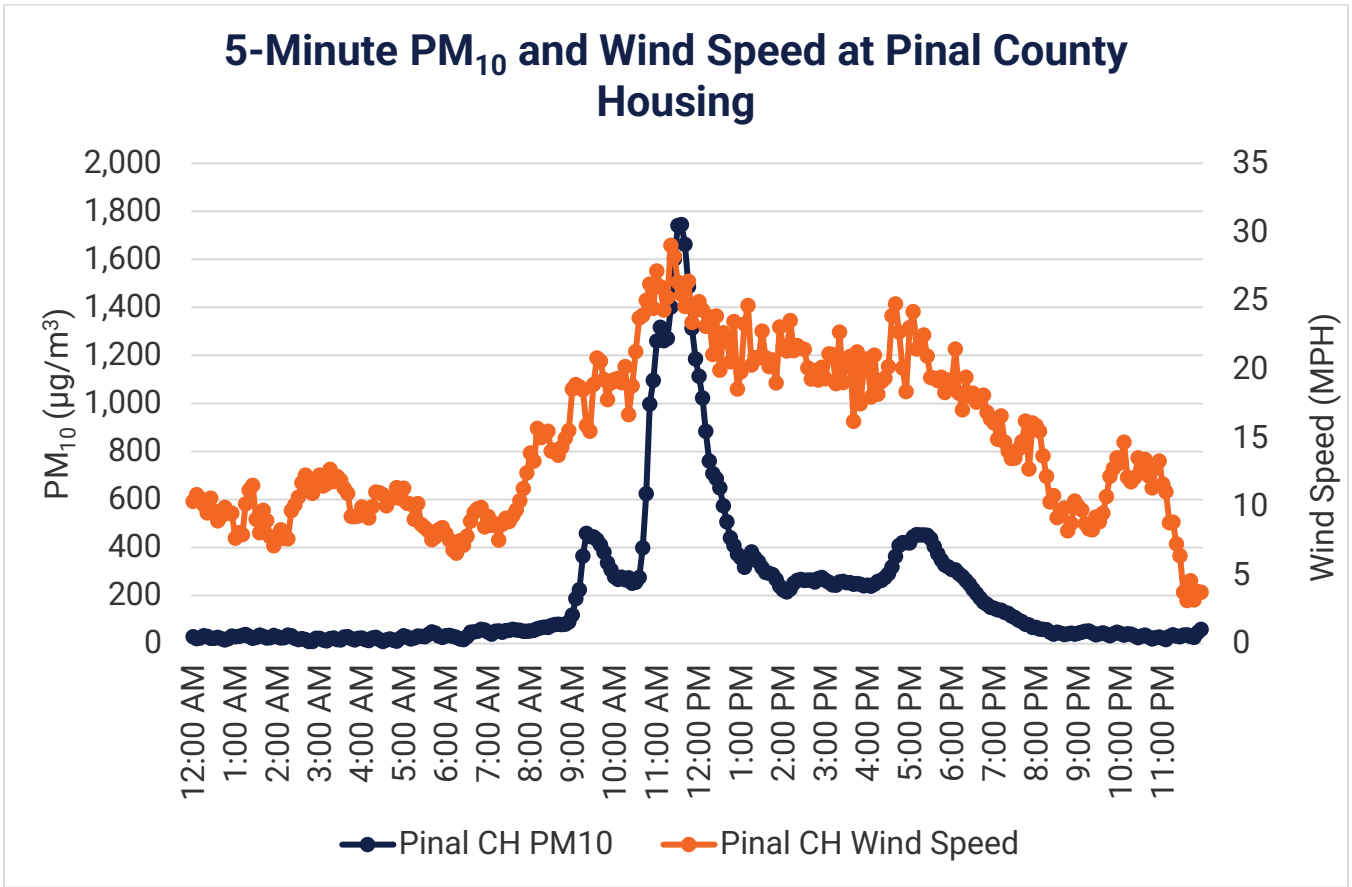

Hourly PM10 and Wind Speed at Stanfield
PM10 (µg/m3)
Wind Speed (MPH)
1,400
1,200
1,000
800
600
400
200
0
50
45
40
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Stanfield PM10
Stanfield Wind Speed
Stanfield Wind Gust

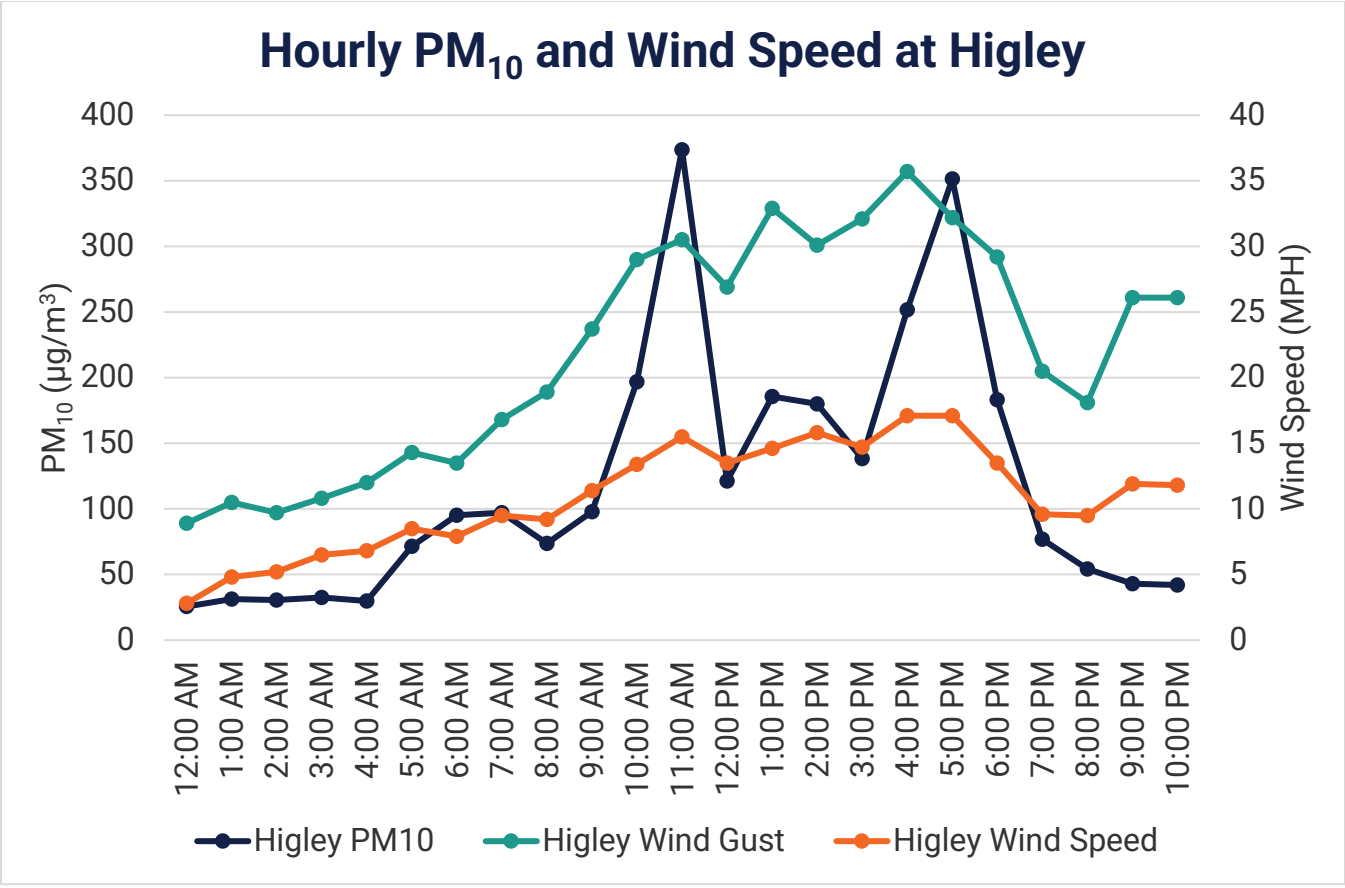
April 21, 2021

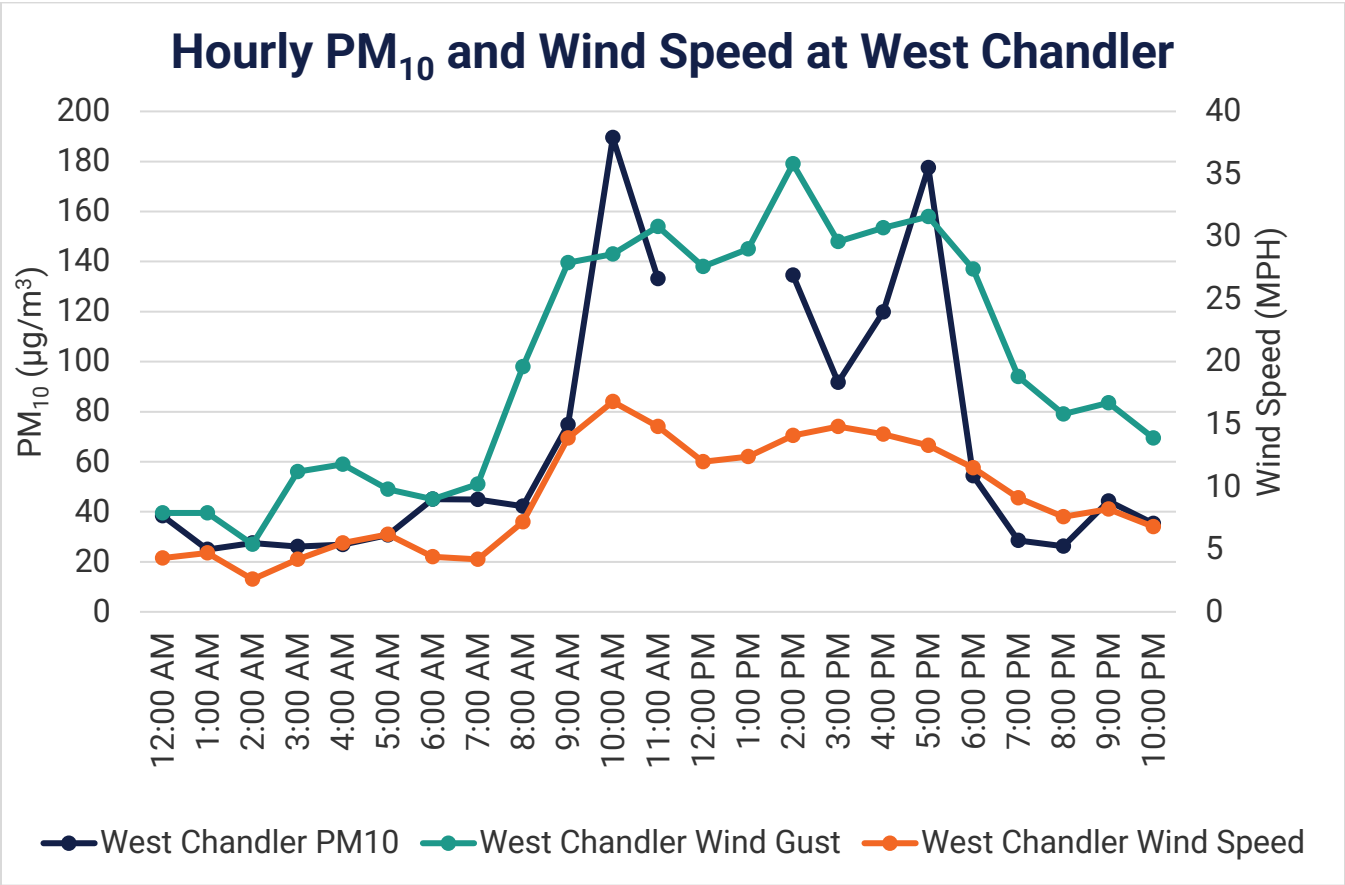


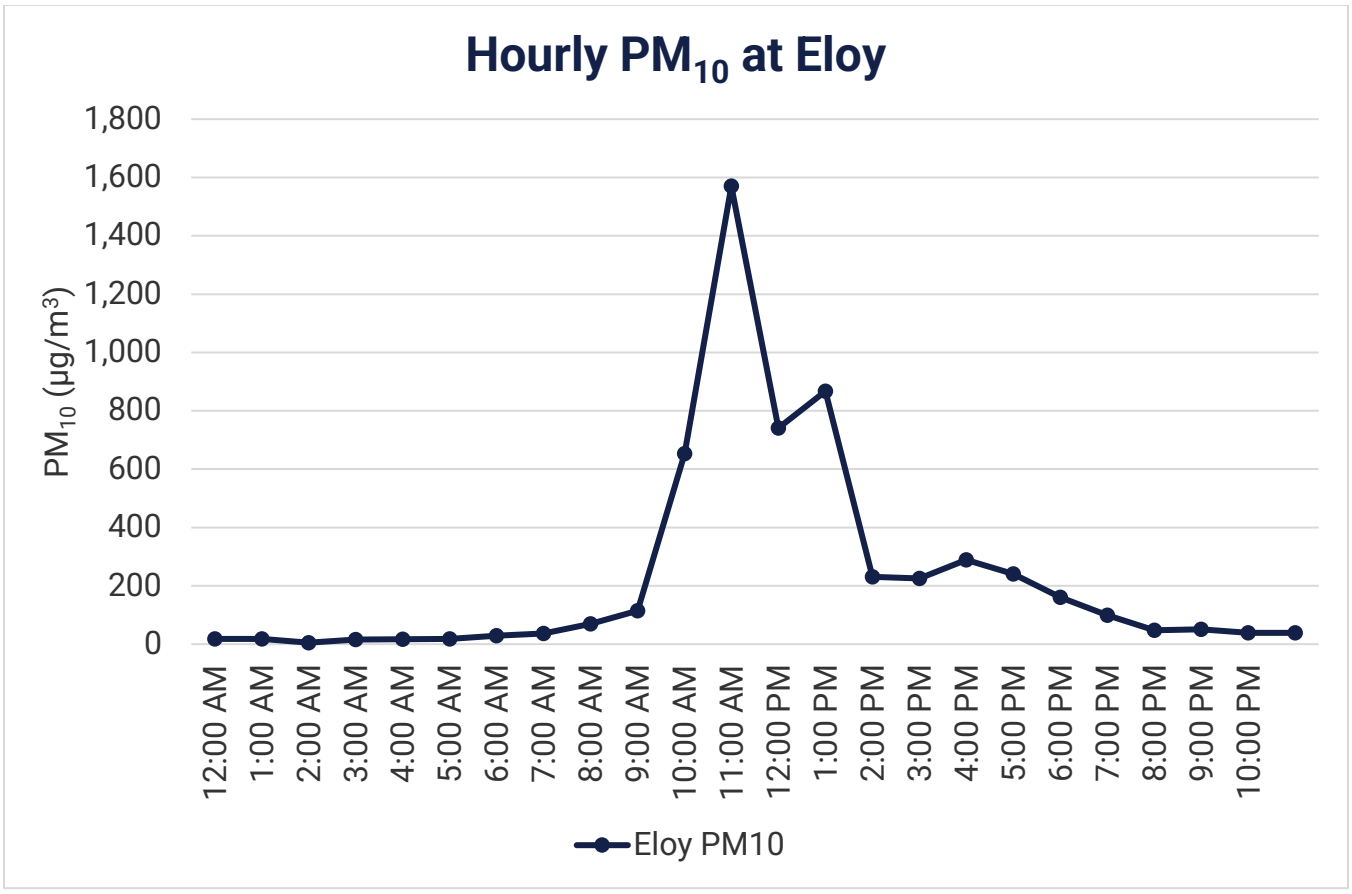


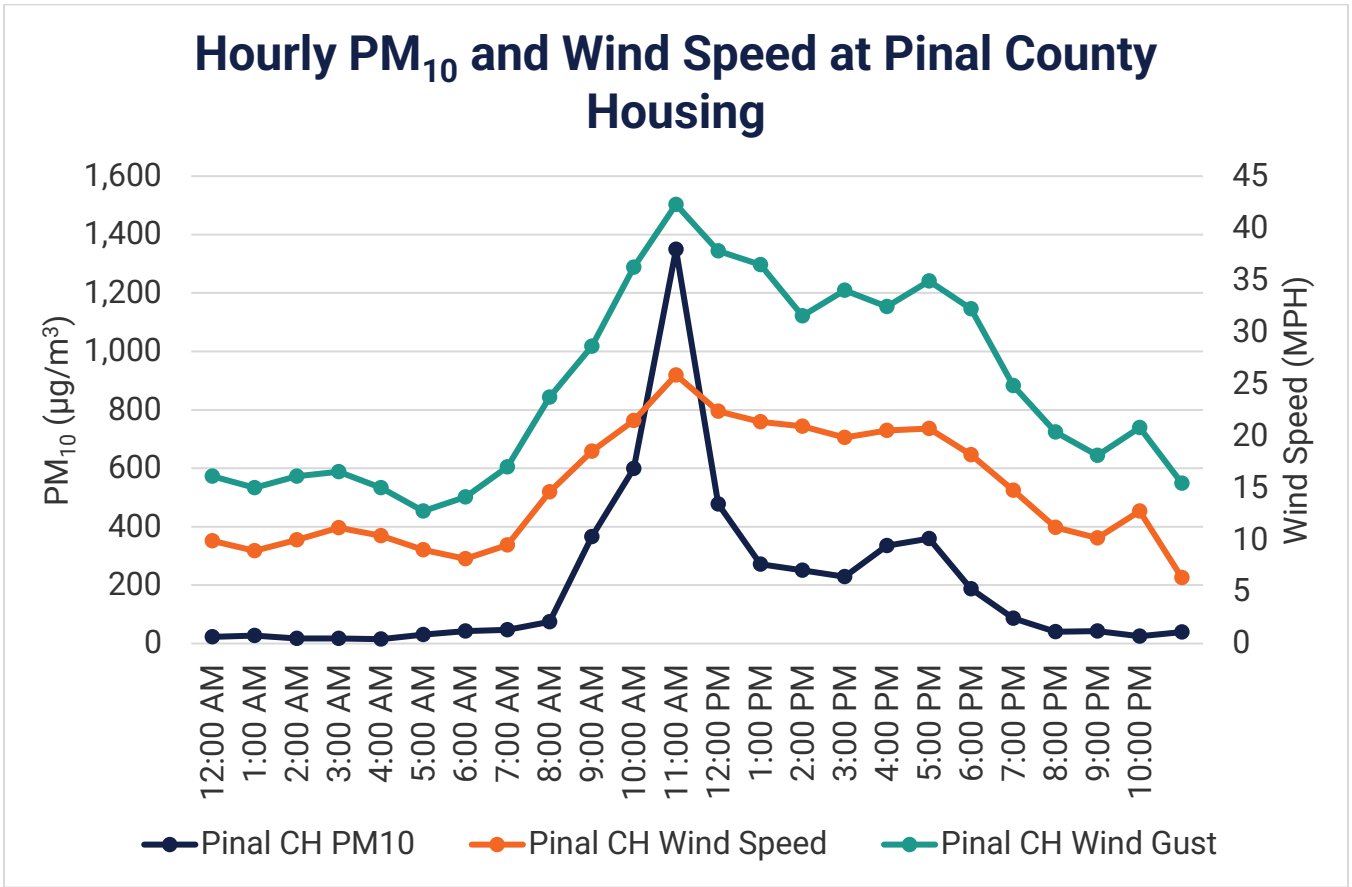

5-Minute PM10 at Eloy
2,500
2,000
1,500
1,000
500
0
PM10 (µg/m3)
12:00 AM
12:50 AM
1:40 AM
2:30 AM
3:20 AM
4:10 AM
5:00 AM
5:50 AM
6:40 AM
7:30 AM
8:20 AM
9:10 AM
10:00 AM
10:50 AM
11:40 AM
12:30 PM
1:20 PM
2:10 PM
3:00 PM
3:50 PM
4:40 PM
5:30 PM
6:20 PM
7:10 PM
8:00 PM
8:50 PM
9:40 PM
10:30 PM
11:20 PM
Eloy PM10


5-Minute PM10 and Wind Speed at Pinal County Housing
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
35
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Pinal CH PM10
Pinal CH Wind Speed

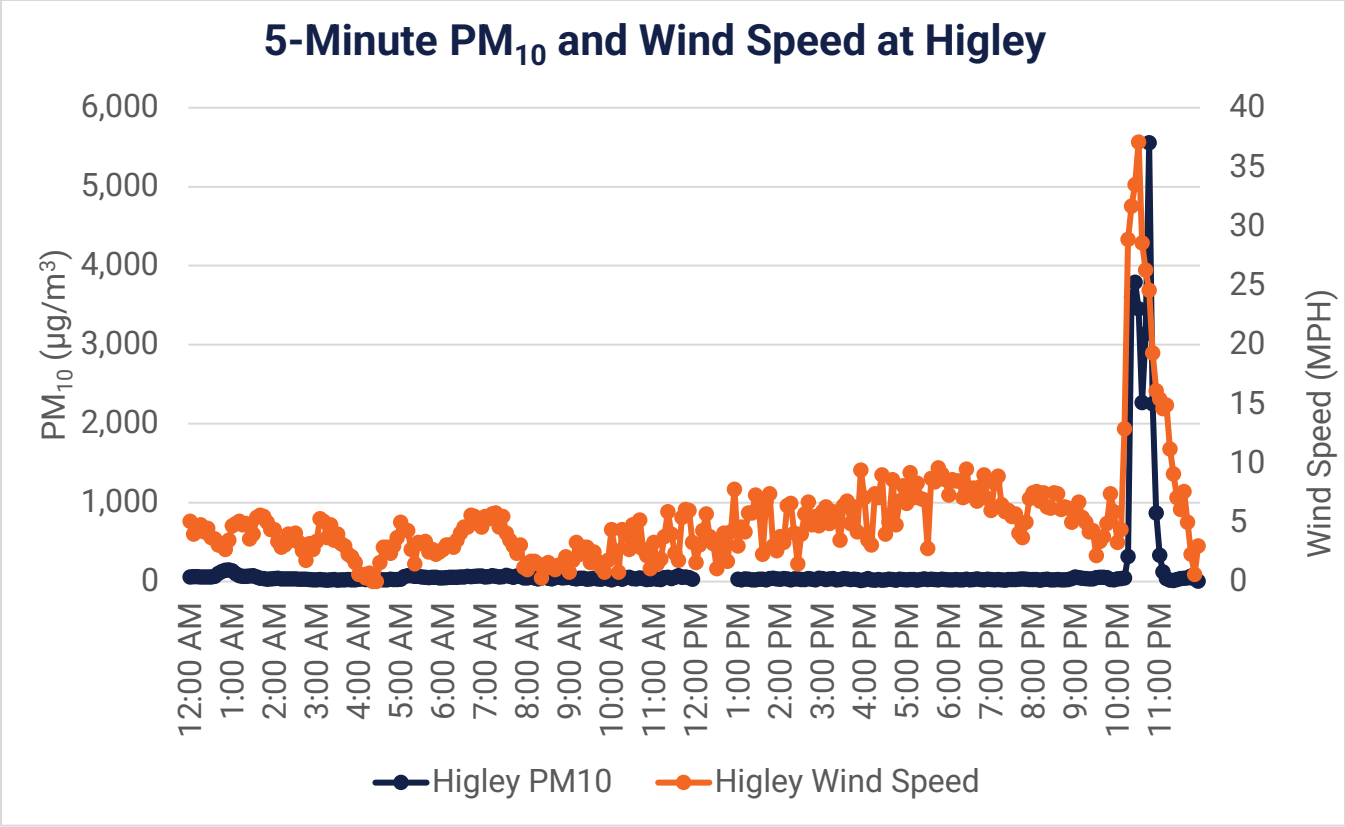

Hourly PM10 and Wind Speed at Higley
PM10 (µg/m3)
Wind Speed (MPH)
400
350
300
250
200
150
100
50
0
40
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
Higley PM10
Higley Wind Gust
Higley Wind Speed

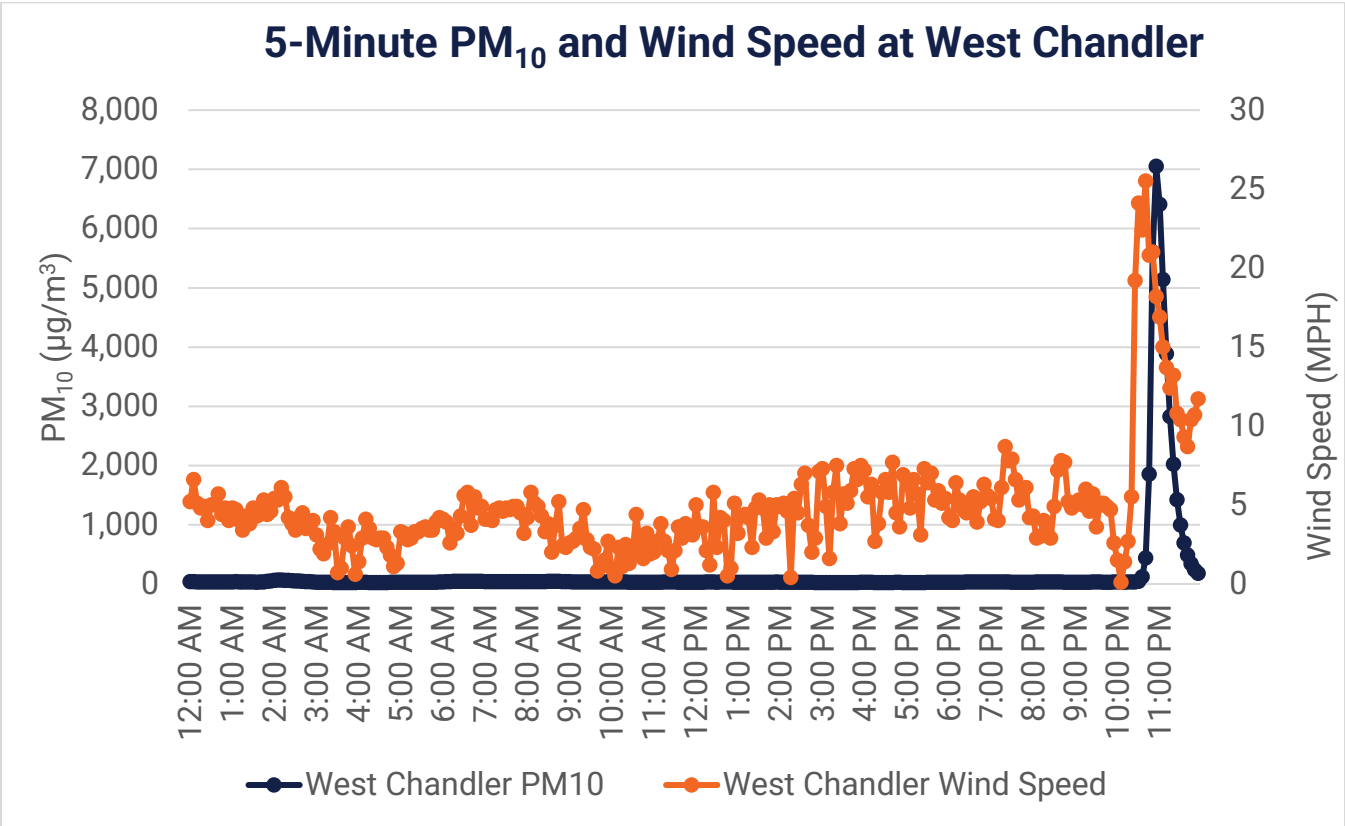

Hourly PM10 and Wind Speed at West Chandler
PM10 (µg/m3)
Wind Speed (MPH)
200
180
160
140
120
100
80
60
40
20
0
40
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
West Chandler PM10
West Chandler Wind Gust
West Chandler Wind Speed

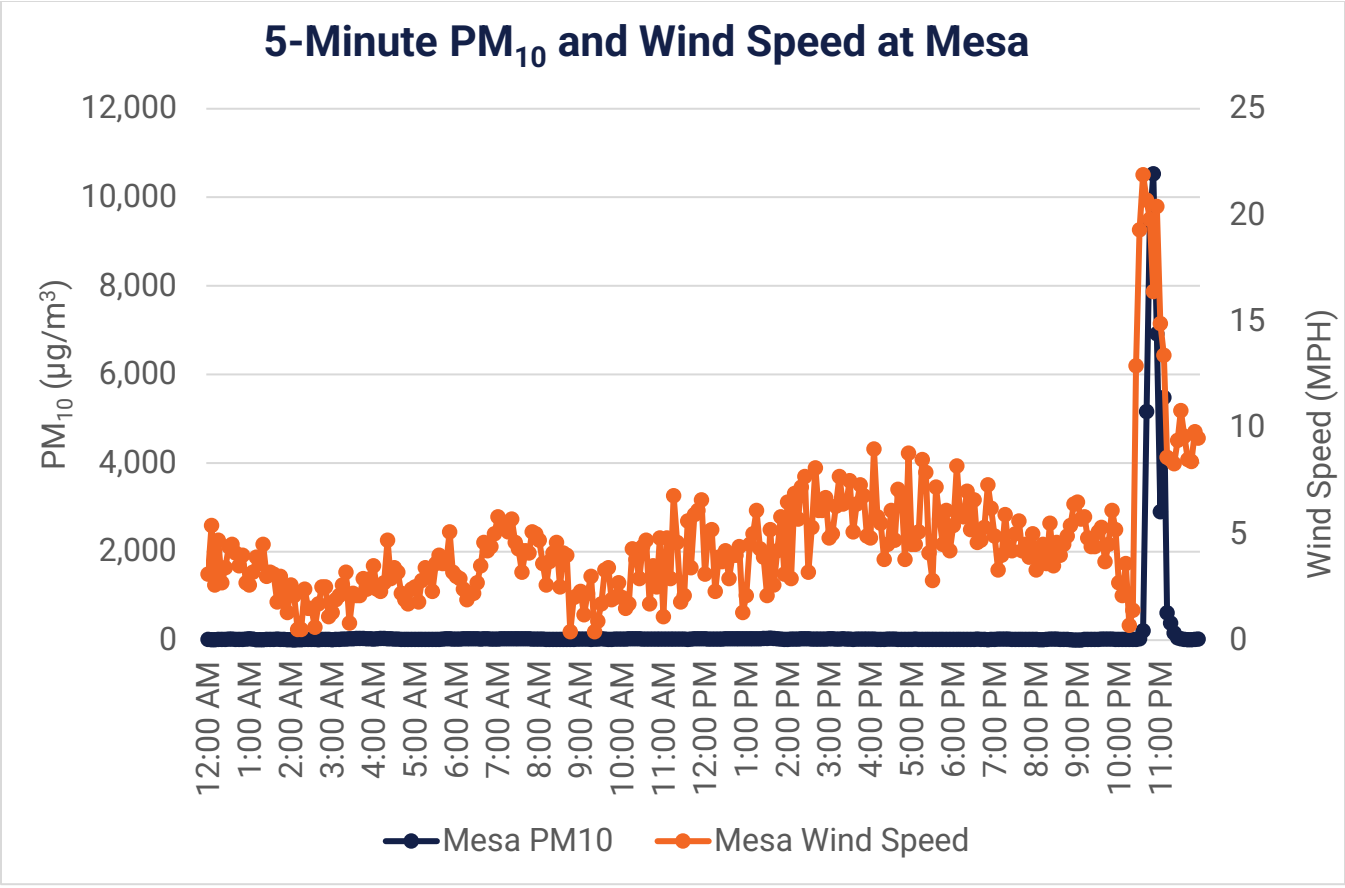

Hourly PM10 at Eloy
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
Eloy PM10

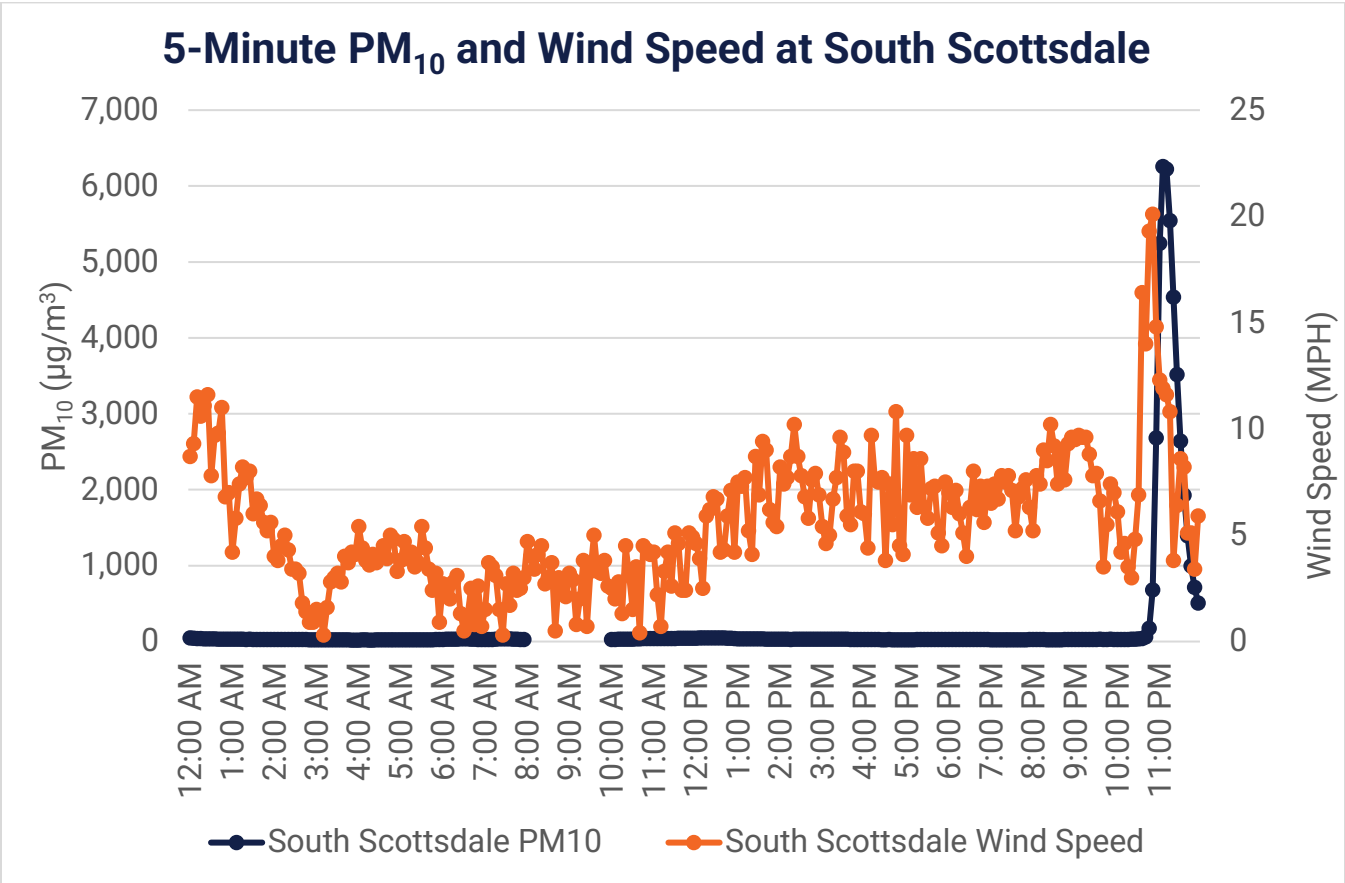

Hourly PM10 and Wind Speed at Pinal County Housing
1,600
1,400
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
45
40
35
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
Pinal CH PM10
Pinal CH Wind Speed
Pinal CH Wind Gust

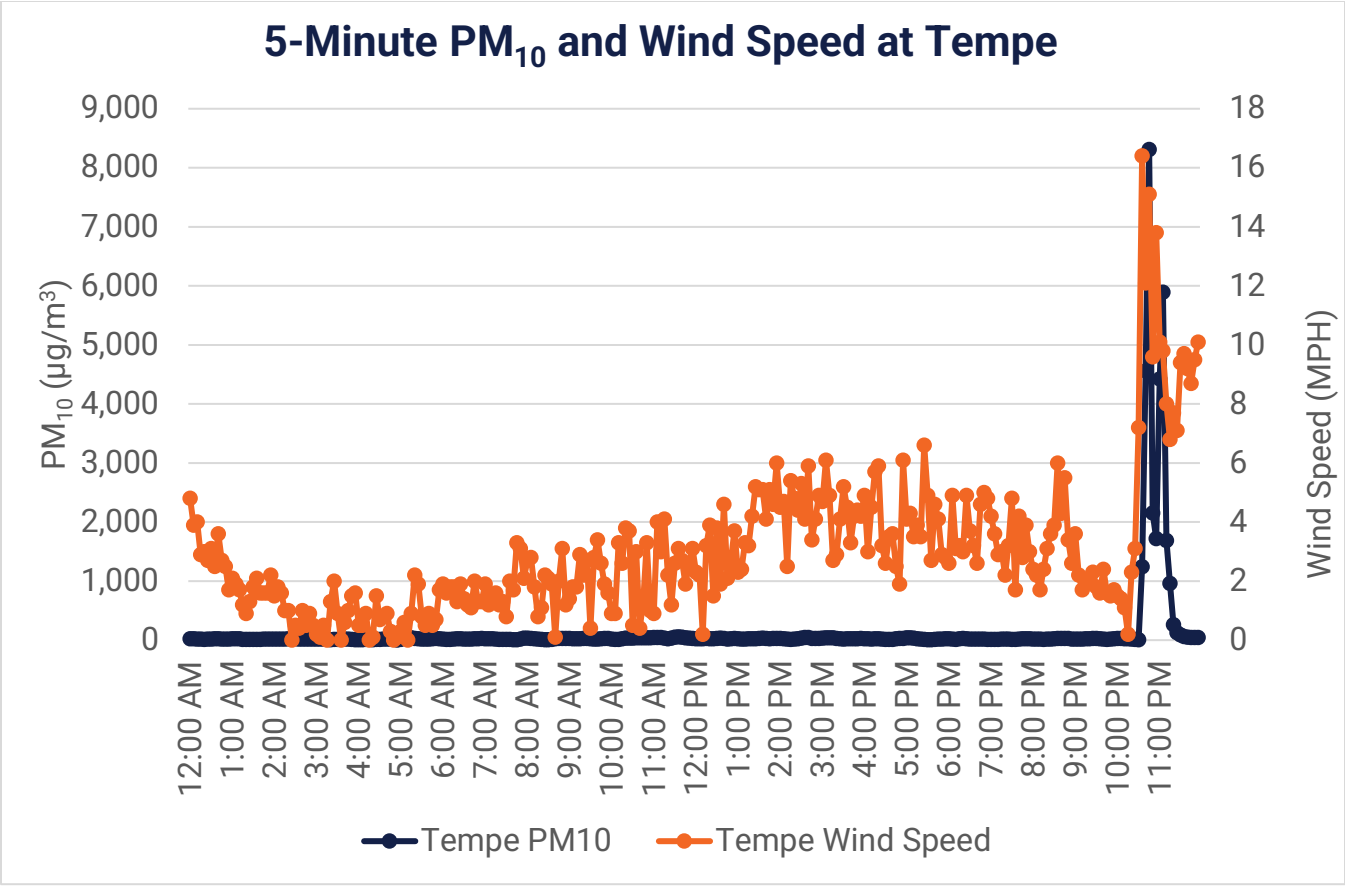
July 9, 2021

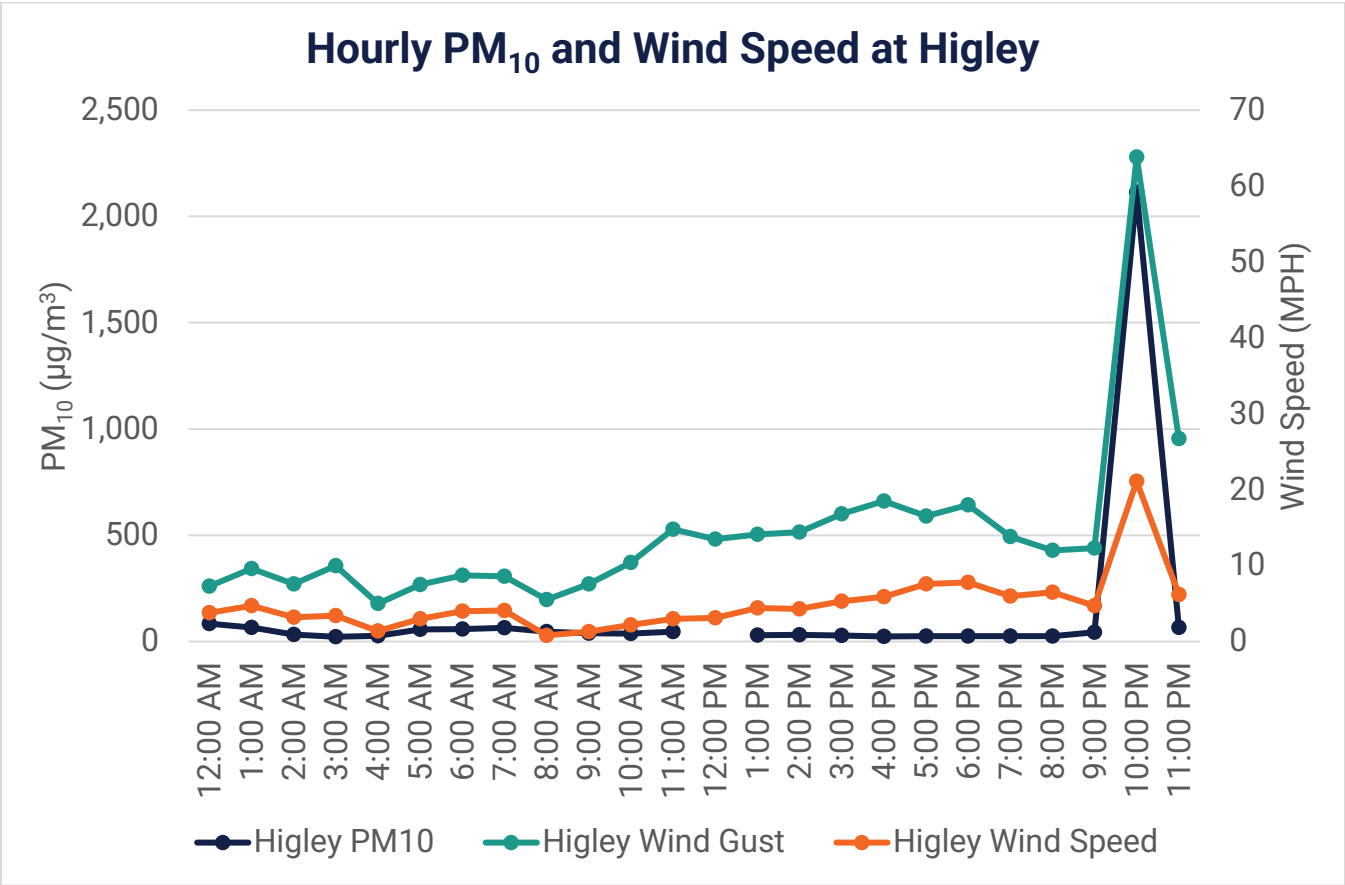

5-Minute PM10 and Wind Speed at Higley
PM10 (µg/m3)
Wind Speed (MPH)
6,000
5,000
4,000
3,000
2,000
1,000
0
40
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Higley PM10
Higley Wind Speed

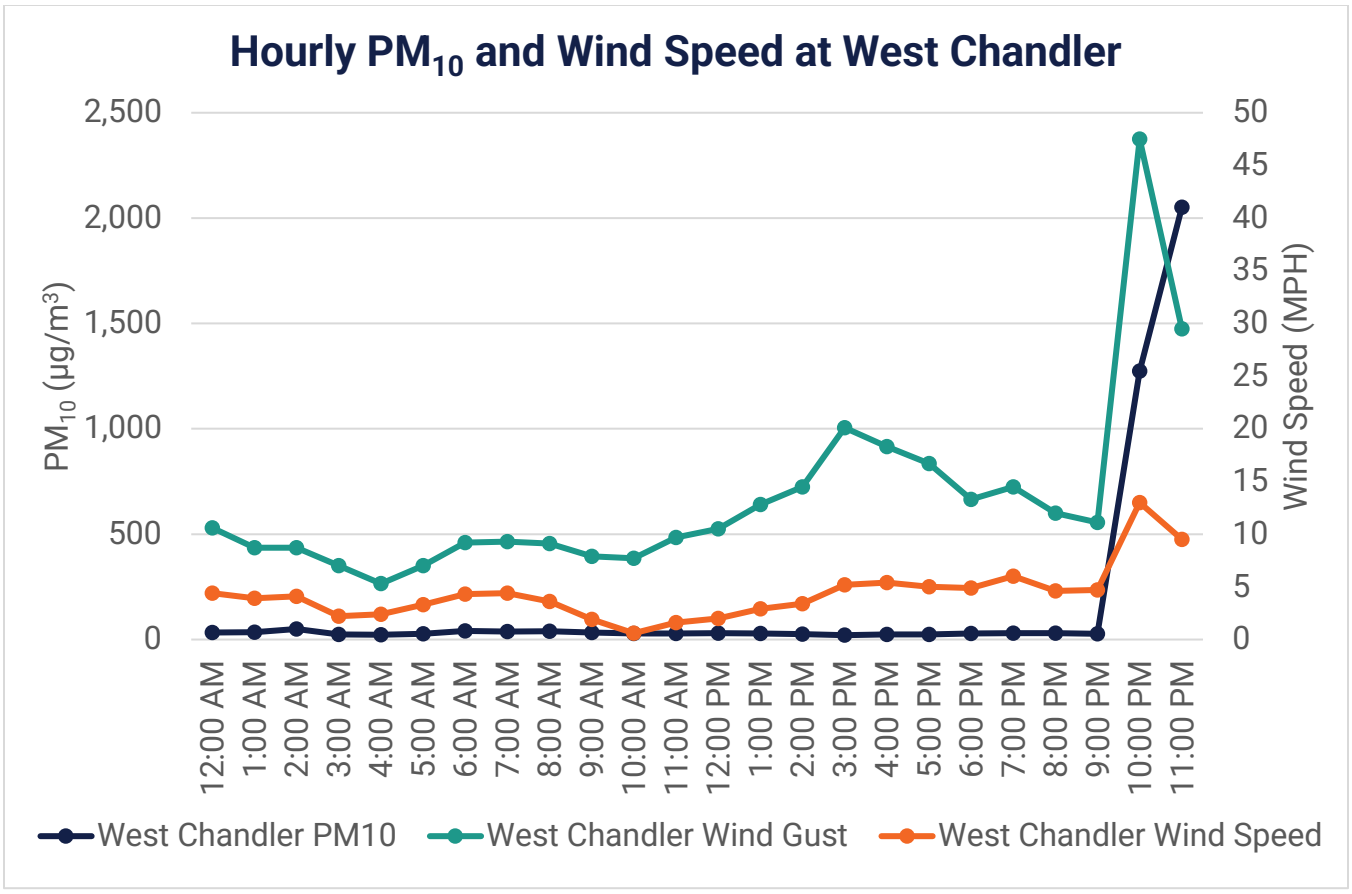

5-Minute PM10 and Wind Speed at West Chandler
PM10 (µg/m3)
Wind Speed (MPH)
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
West Chandler PM10
West Chandler Wind Speed

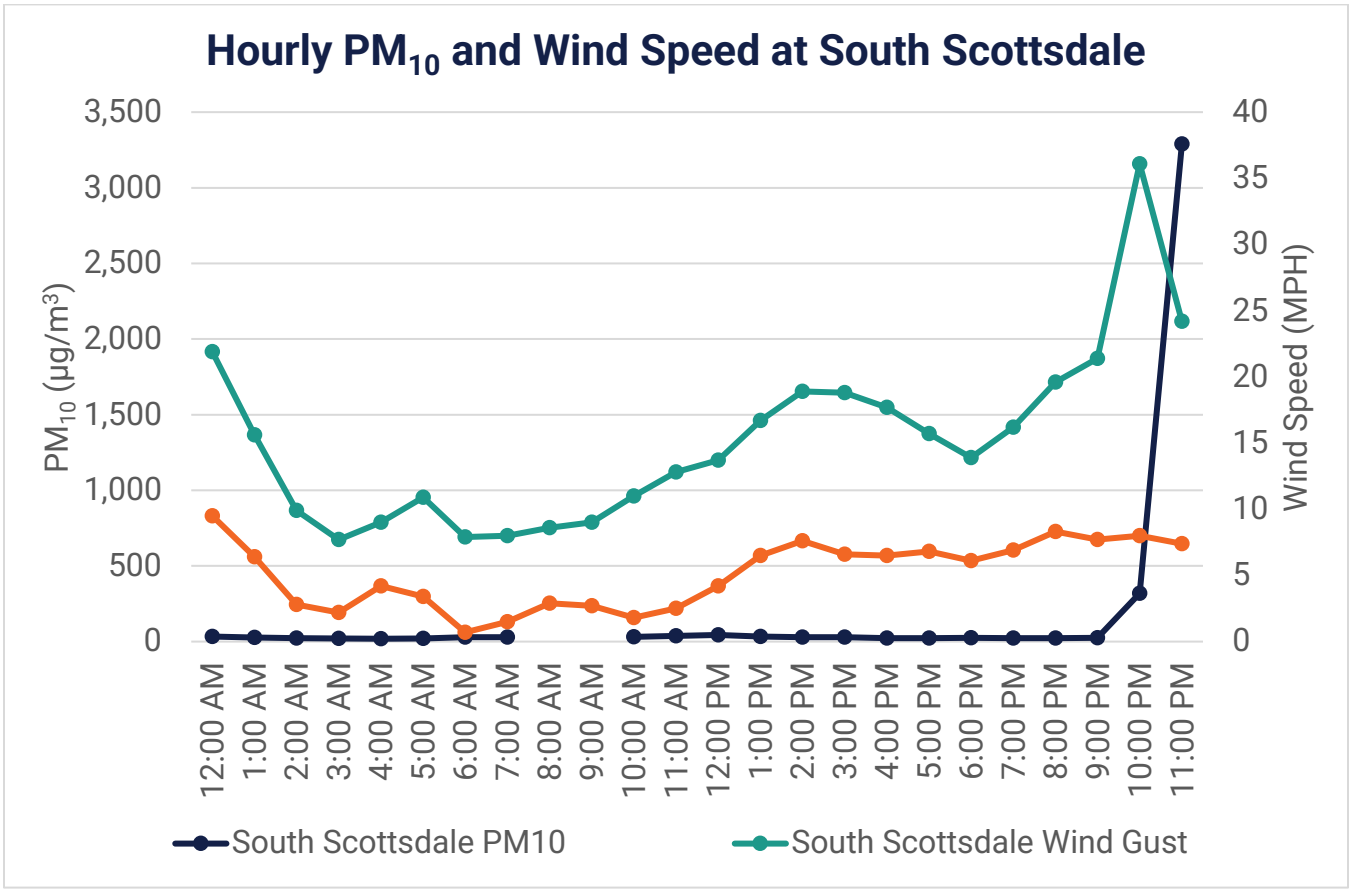

5-Minute PM10 and Wind Speed at Mesa
12,000
10,000
8,000
6,000
4,000
2,000
0
PM10 (µg/m3)
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Mesa PM10
Mesa Wind Speed

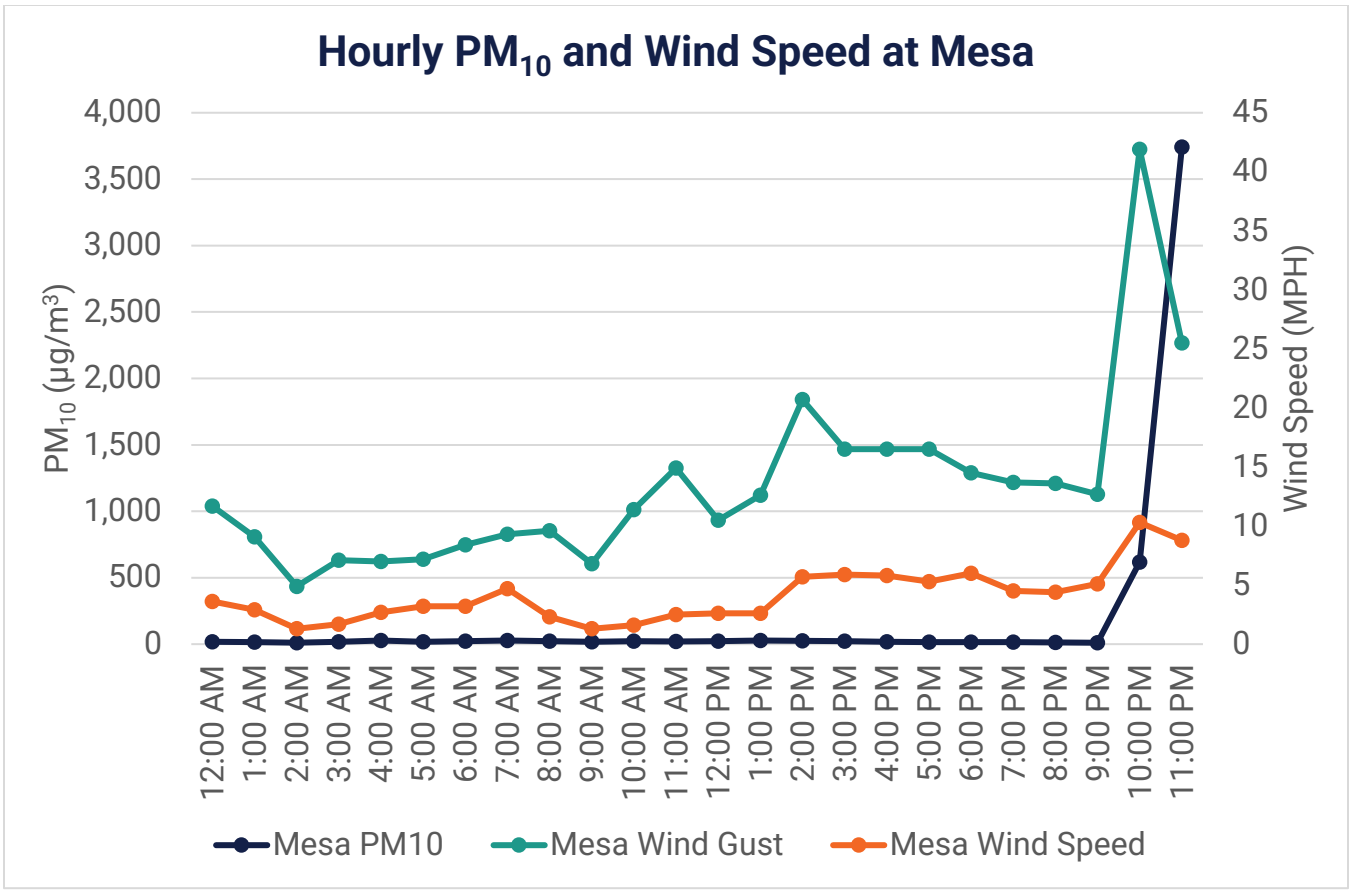

5-Minute PM10 and Wind Speed at South Scottsdale
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
PM10 (µg/m3)
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
South Scottsdale PM10
South Scottsdale Wind Speed

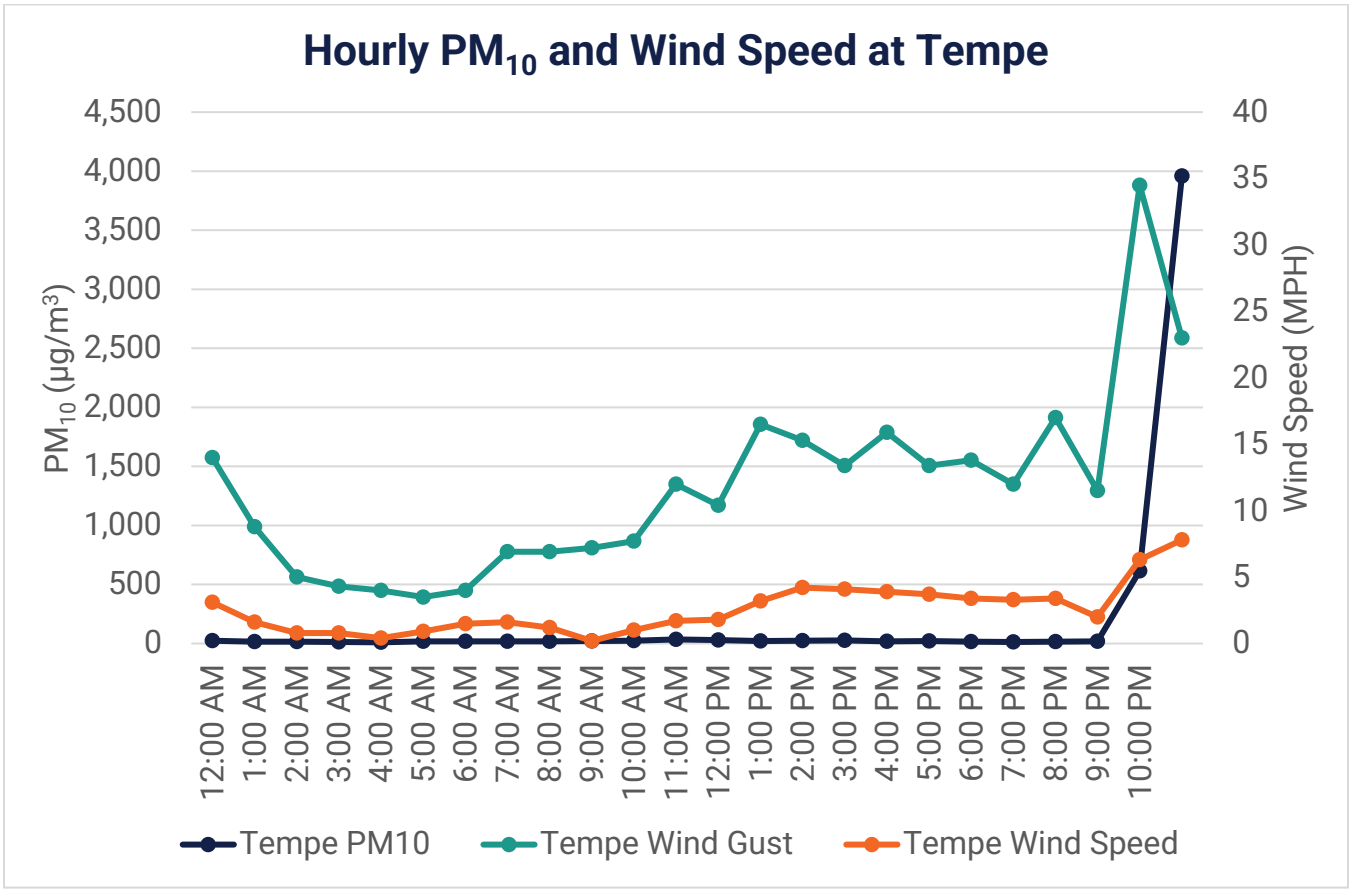

5-Minute PM10 and Wind Speed at Tempe
PM10 (µg/m3)
Wind Speed (MPH)
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
18
16
14
12
10
8
6
4
2
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Tempe PM10
Tempe Wind Speed


Hourly PM10 and Wind Speed at Higley
PM10 (µg/m3)
Wind Speed (MPH)
2,500
2,000
1,500
1,000
500
0
70
60
50
40
30
20
10
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Higley PM10
Higley Wind Gust
Higley Wind Speed

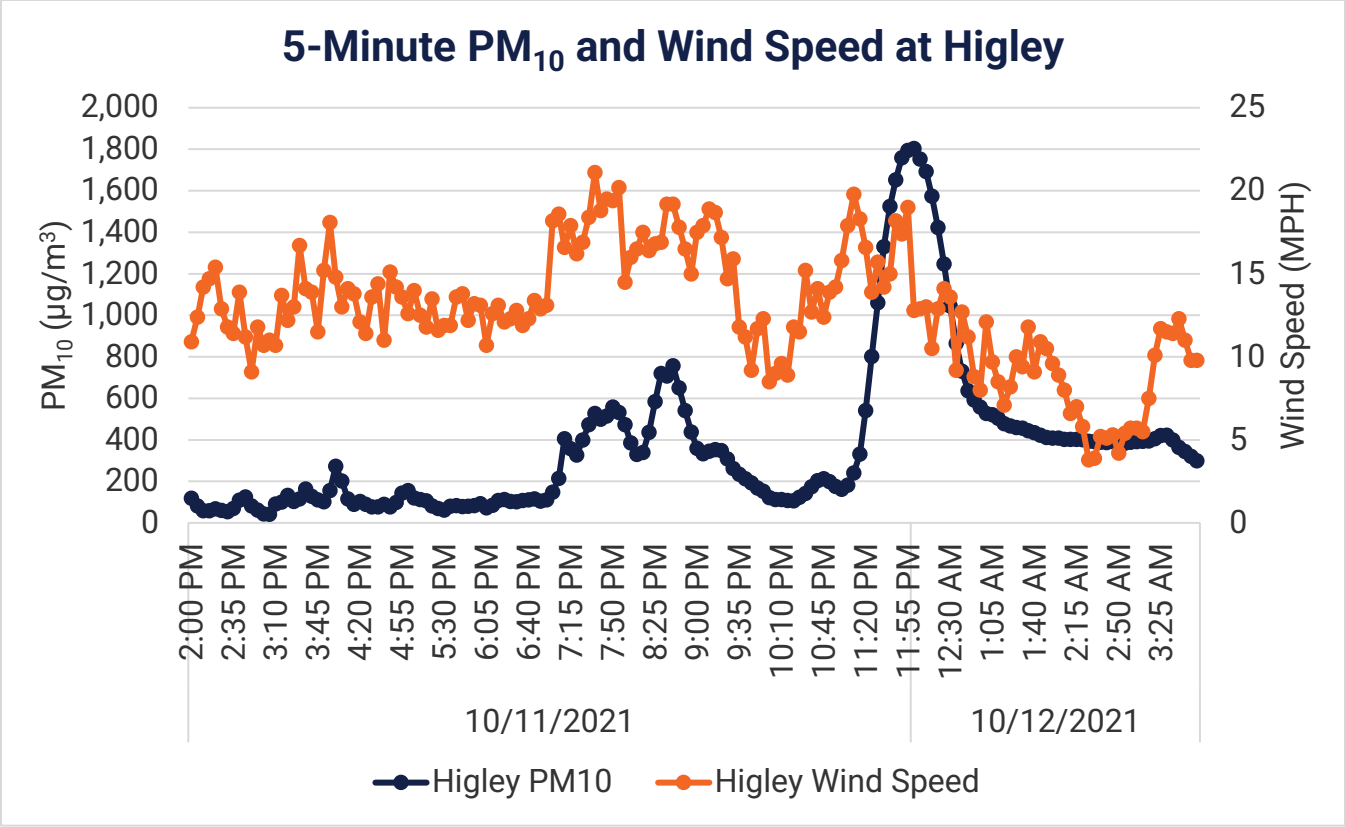

Hourly PM10 and Wind Speed at West Chandler
2,500
2,000
1,500
1,000
500
0
PM10 (µg/m3)
50
45
40
35
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
West Chandler PM10
West Chandler Wind Gust
West Chandler Wind Speed

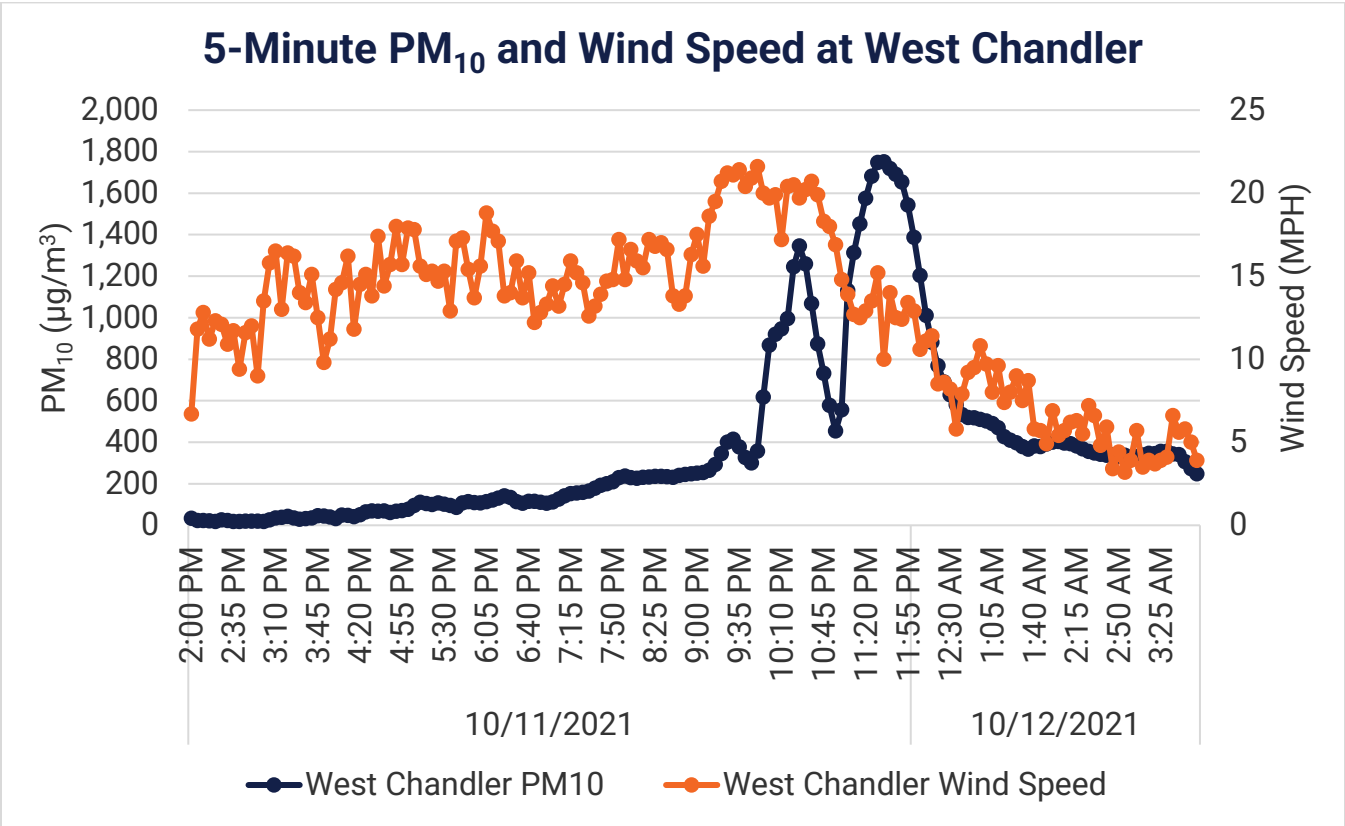

Hourly PM10 and Wind Speed at South Scottsdale
3,500
3,000
2,500
2,000
1,500
1,000
500
0
PM10 (µg/m3)
40
35
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
South Scottsdale PM10
South Scottsdale Wind Gust

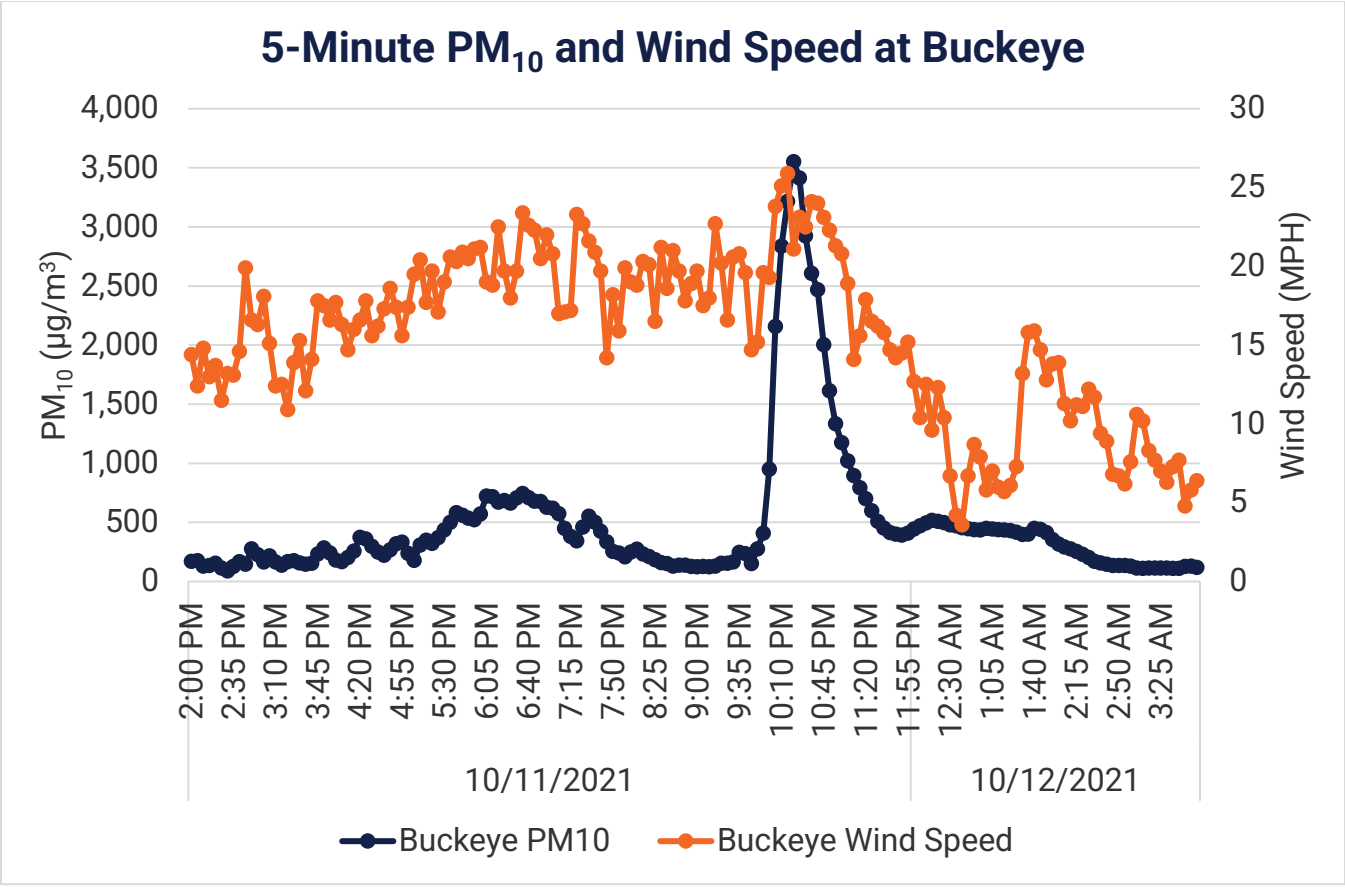

Hourly PM10 and Wind Speed at Mesa
PM10 (µg/m3)
Wind Speed (MPH)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
45
40
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Mesa PM10
Mesa Wind Gust
Mesa Wind Speed

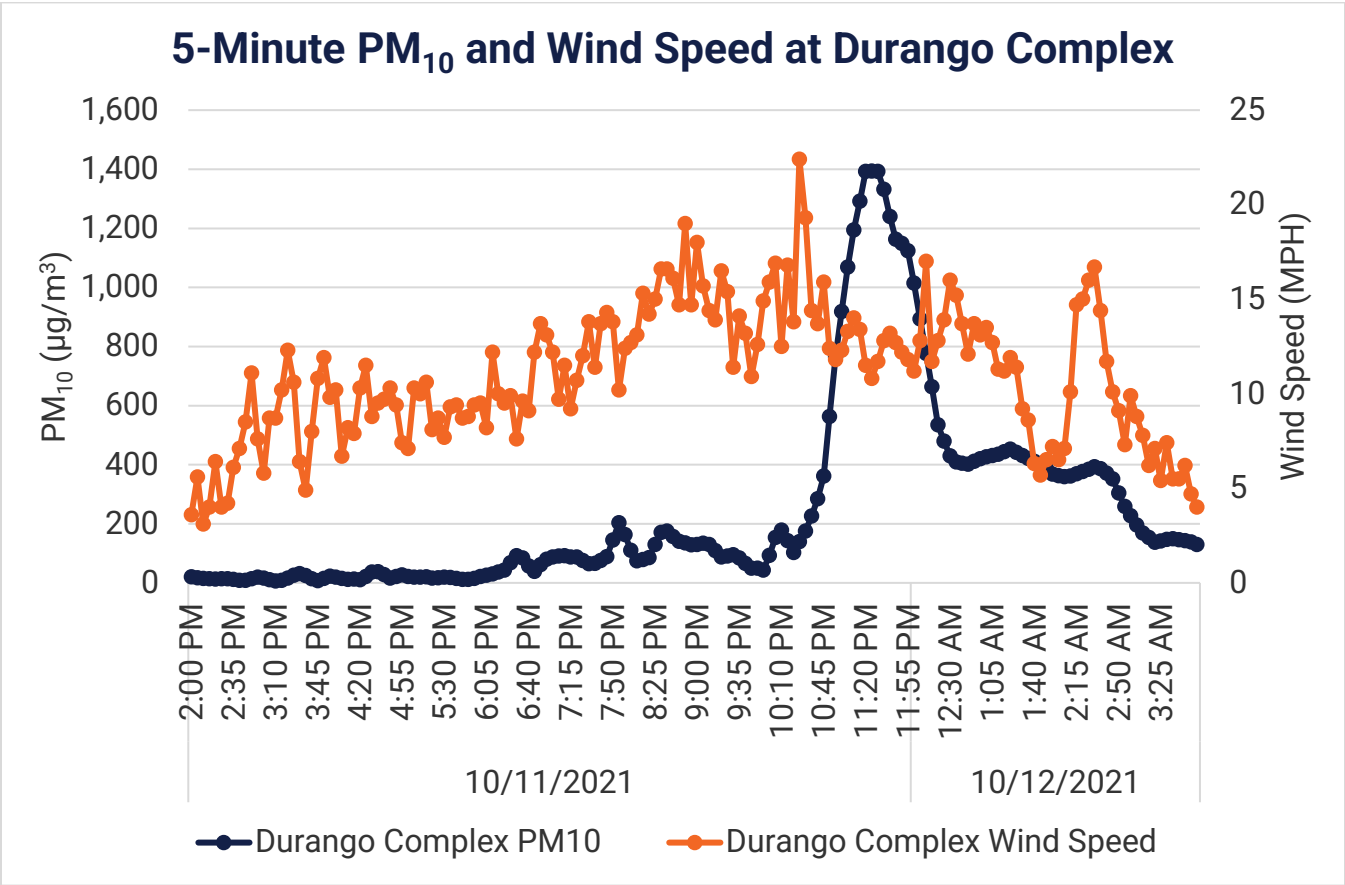

Hourly PM10 and Wind Speed at Tempe
PM10 (µg/m3)
Wind Speed (MPH)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
40
35
30
25
20
15
10
5
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
Tempe PM10
Tempe Wind Gust
Tempe Wind Speed

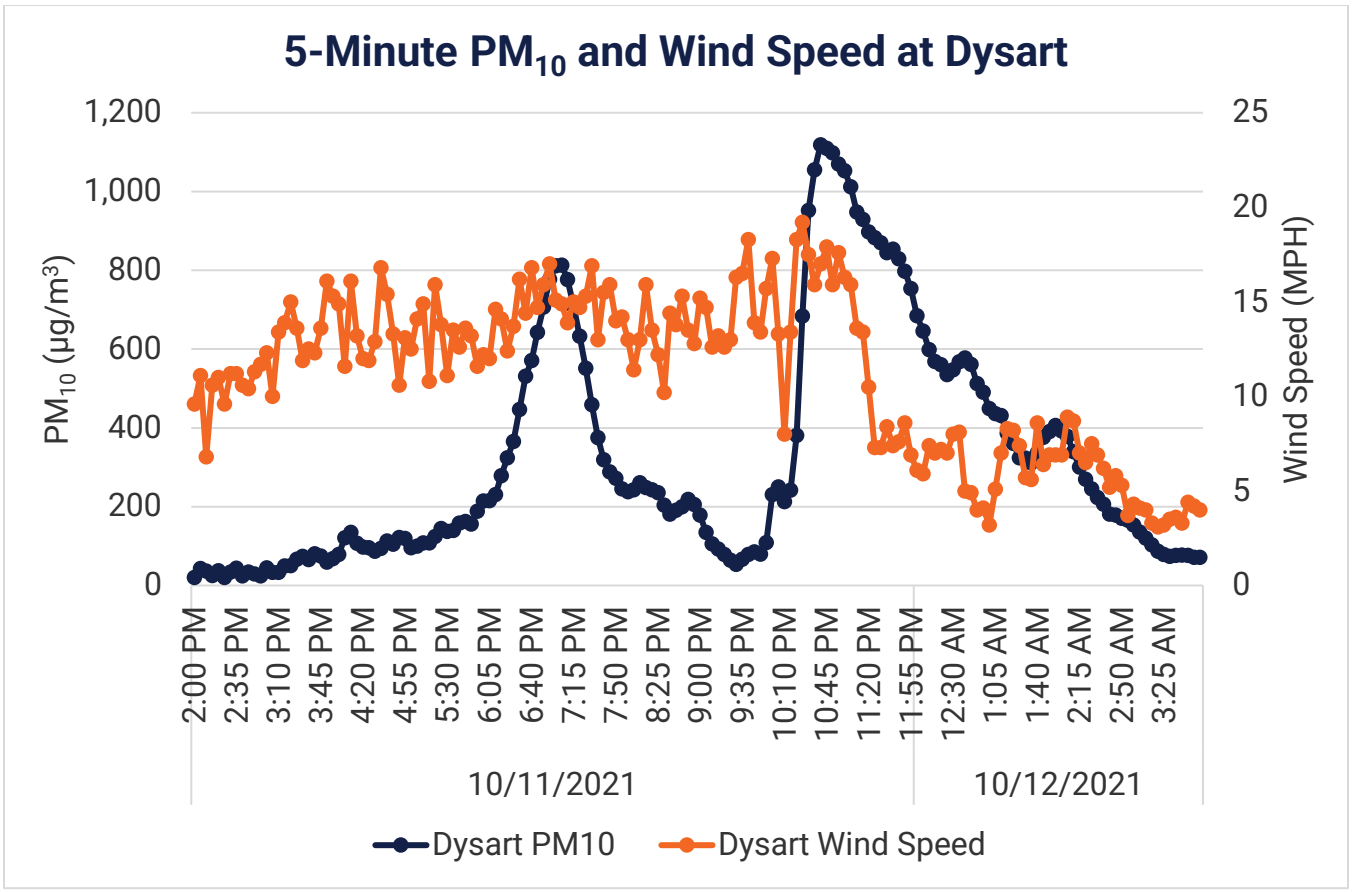
October 11-12, 2021

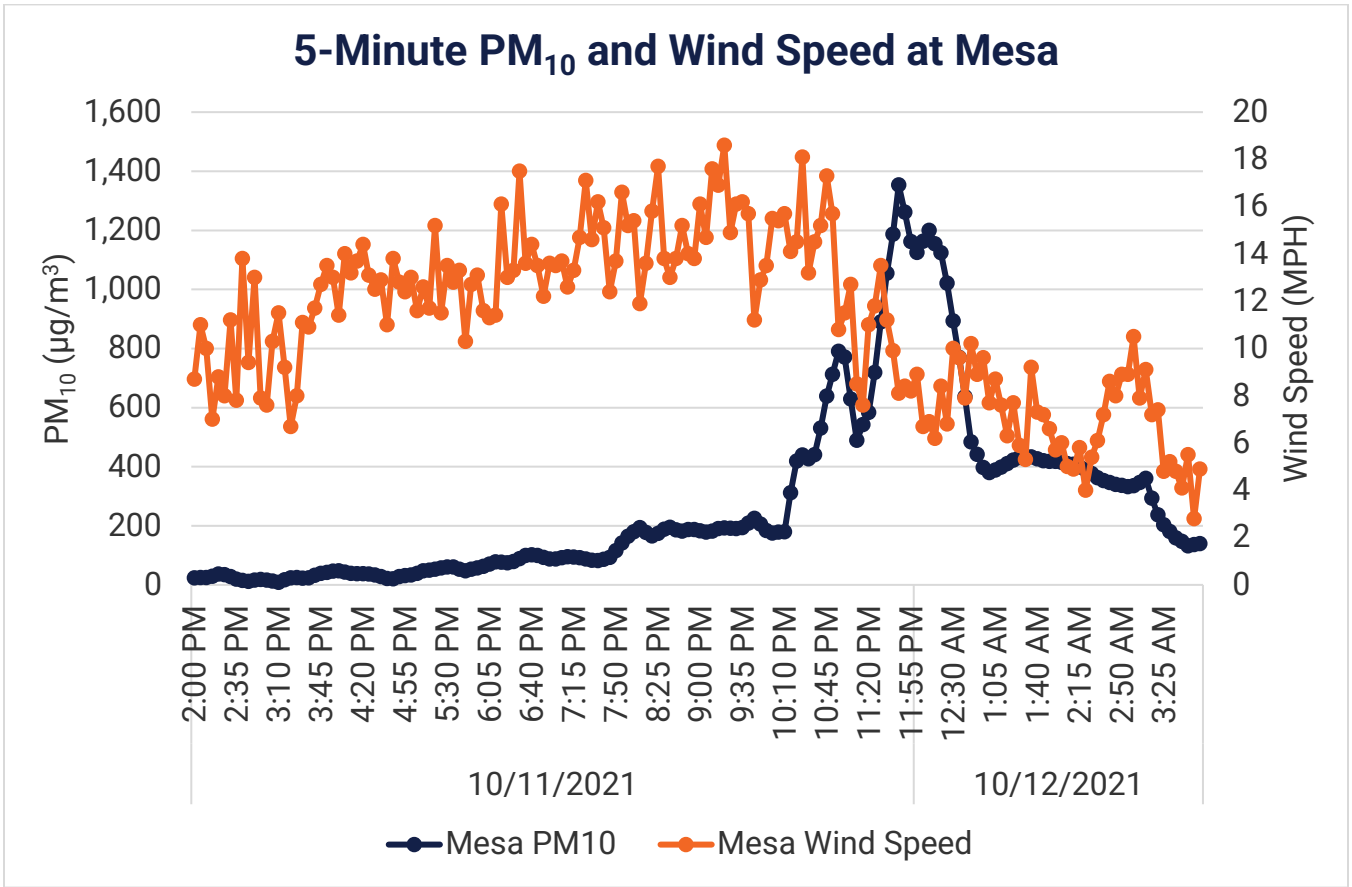


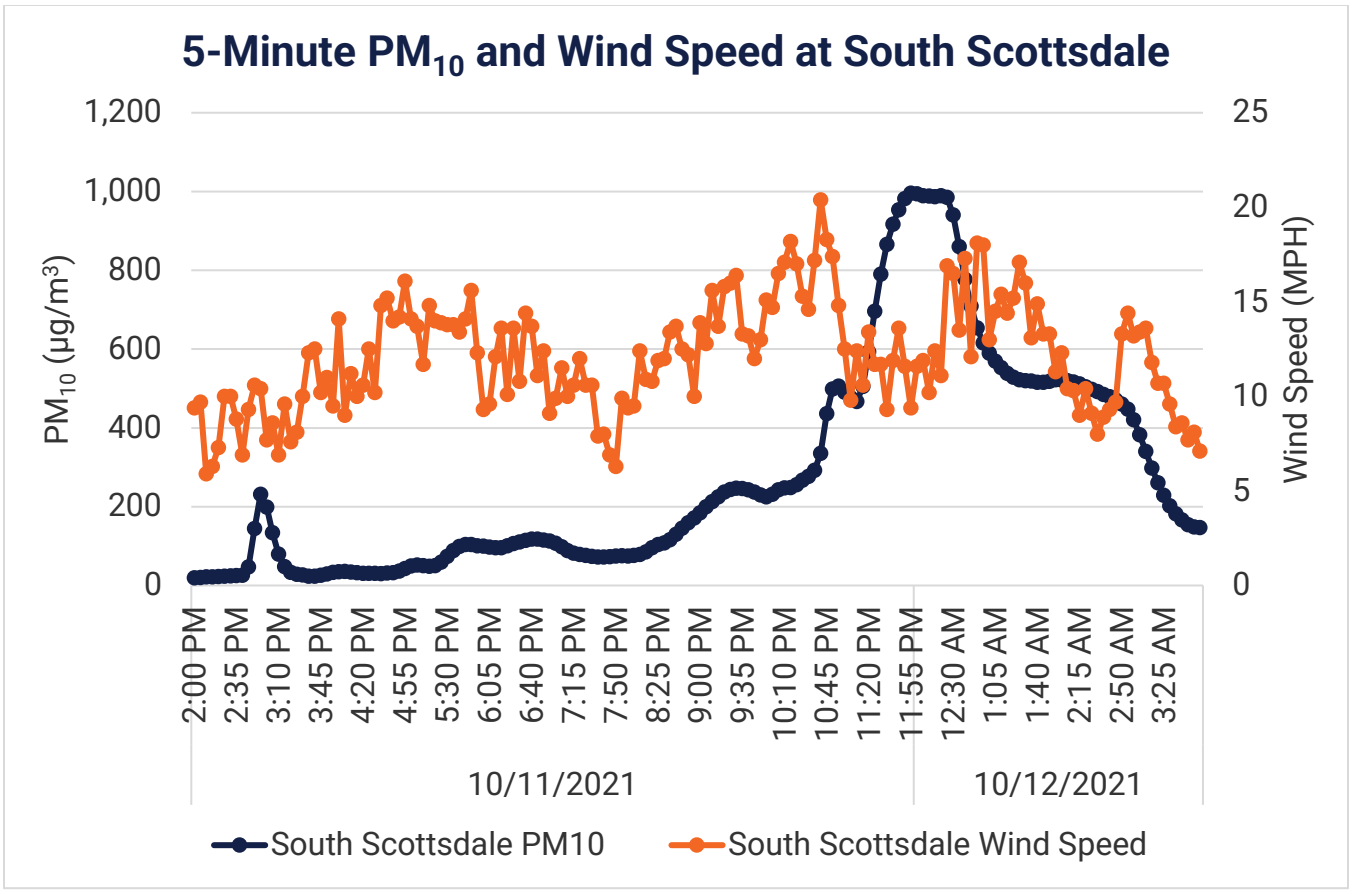


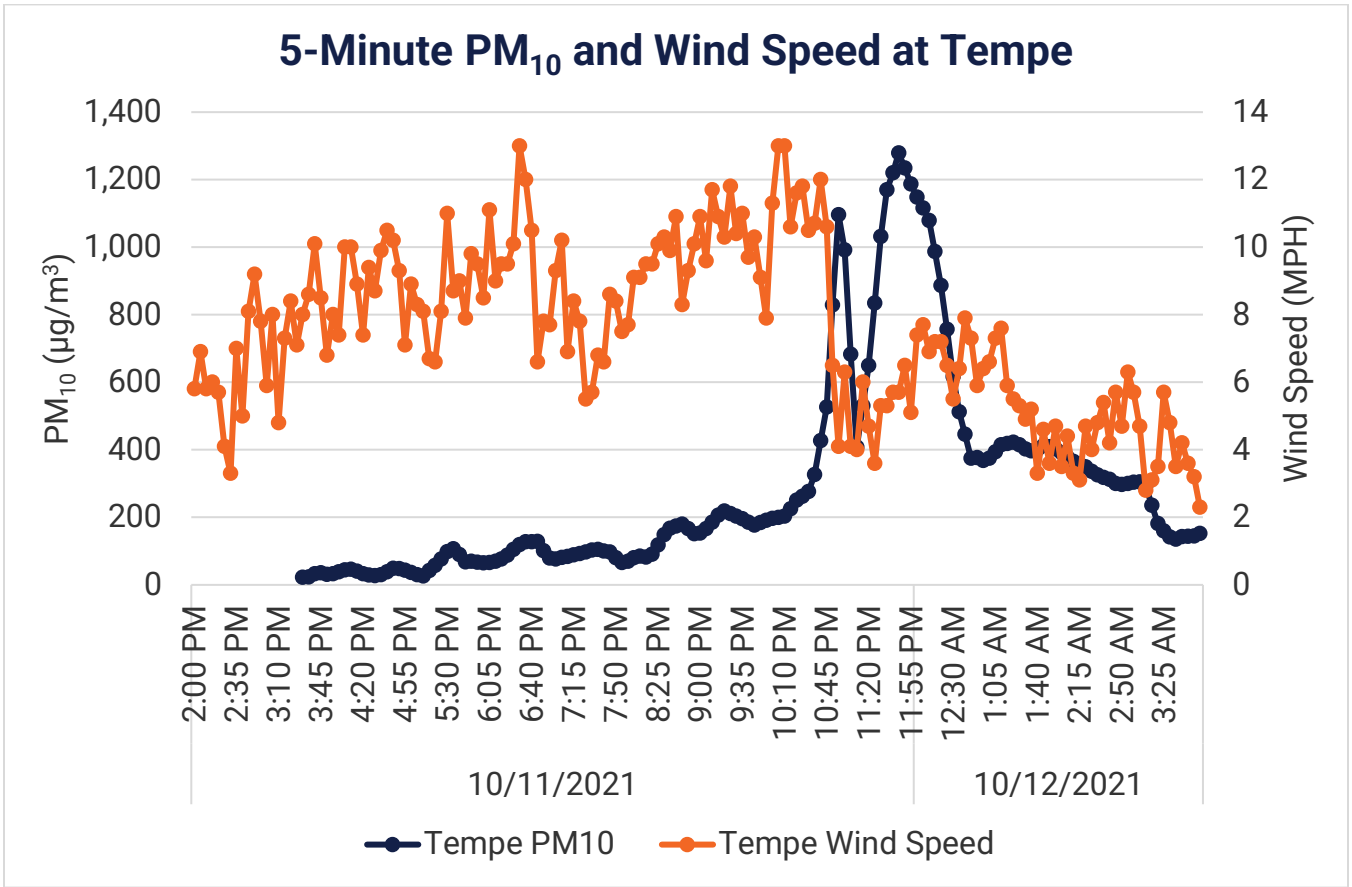

5-Minute PM10 and Wind Speed at Buckeye
PM10 (µg/m3)
Wind Speed (MPH)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
30
25
20
15
10
5
0
2:00 PM
2:35 PM
3:10 PM
3:45 PM
4:20 PM
4:55 PM
5:30 PM
6:05 PM
6:40 PM
7:15 PM
7:50 PM
8:25 PM
9:00 PM
9:35 PM
10:10 PM
10:45 PM
11:20 PM
11:55 PM
12:30 AM
1:05 AM
1:40 AM
2:15 AM
2:50 AM
3:25 AM
10/11/2021
10/12/2021
Buckeye PM10
Buckeye Wind Speed

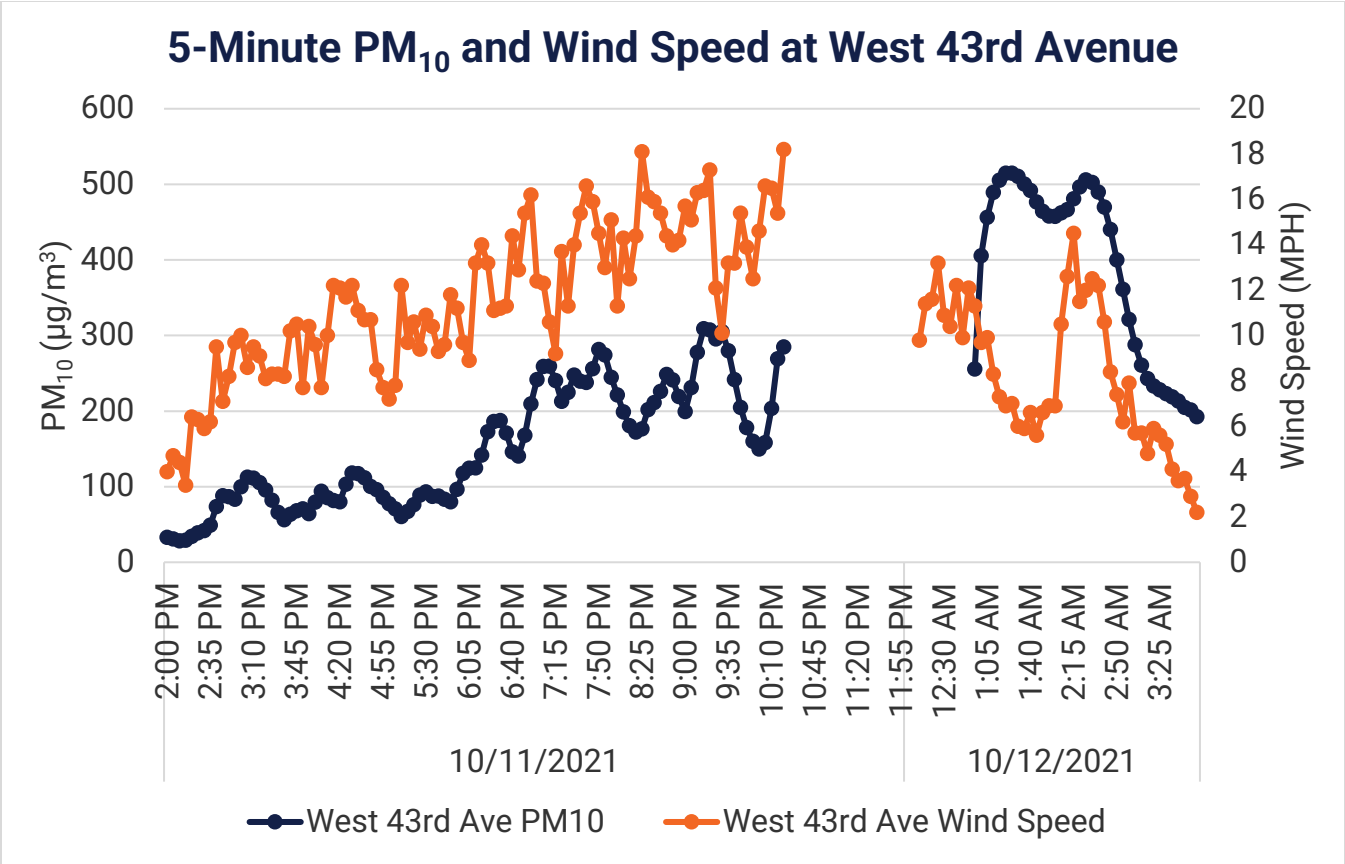

5-Minute PM10 and Wind Speed at Durango Complex
PM10 (µg/m3)
Wind Speed (MPH)
1,600
1,400
1,200
1,000
800
600
400
200
0
25
20
15
10
5
0
2:00 PM
2:35 PM
3:10 PM
3:45 PM
4:20 PM
4:55 PM
5:30 PM
6:05 PM
6:40 PM
7:15 PM
7:50 PM
8:25 PM
9:00 PM
9:35 PM
10:10 PM
10:45 PM
11:20 PM
11:55 PM
12:30 AM
1:05 AM
1:40 AM
2:15 AM
2:50 AM
3:25 AM
10/11/2021
10/12/2021
Durango Complex PM10
Durango Complex Wind Speed

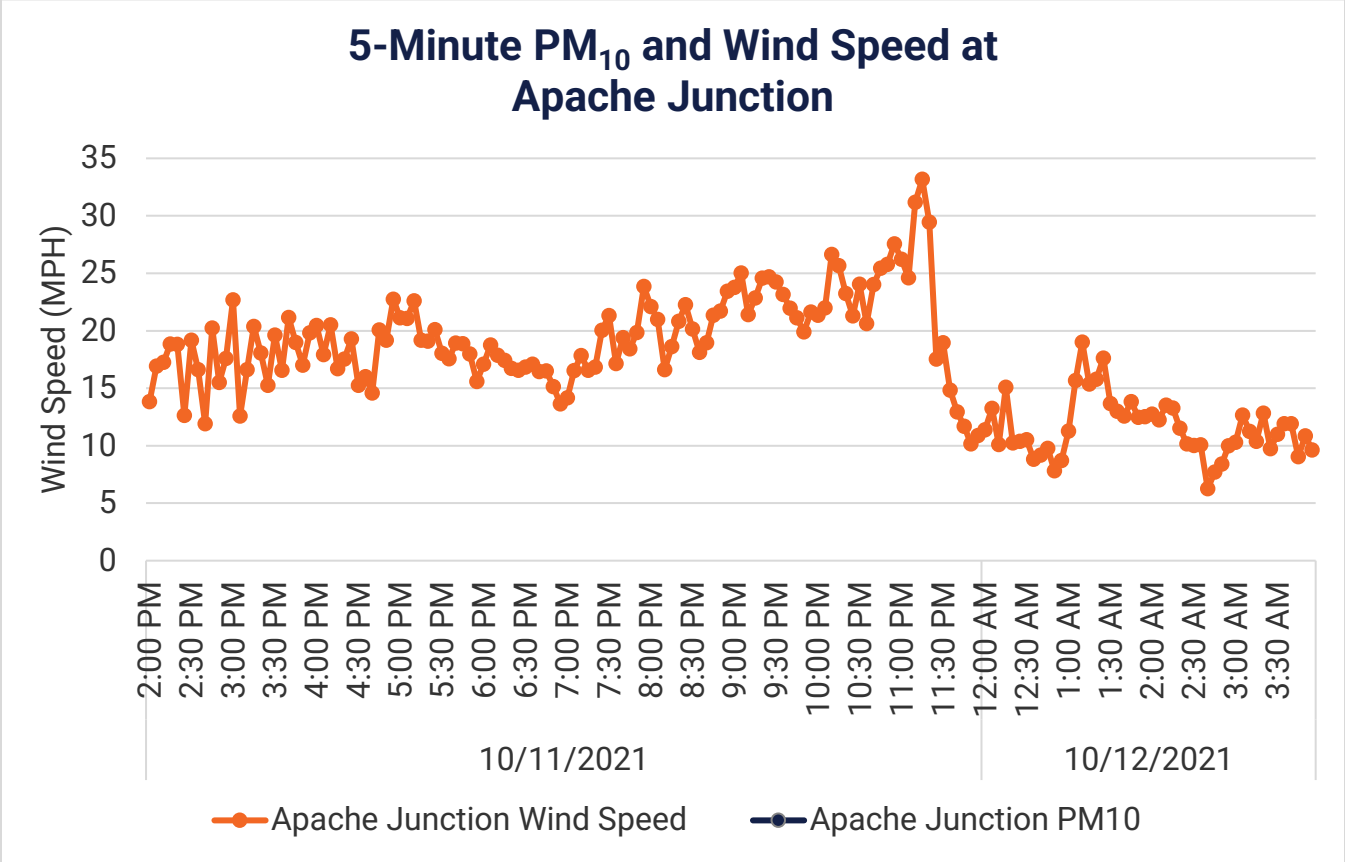

5-Minute PM10 and Wind Speed at Dysart
PM10 (µg/m3)
Wind Speed (MPH)
1,200
1,000
800
600
400
200
0
25
20
15
10
5
0
2:00 PM
2:35 PM
3:10 PM
3:45 PM
4:20 PM
4:55 PM
5:30 PM
6:05 PM
6:40 PM
7:15 PM
7:50 PM
8:25 PM
9:00 PM
9:35 PM
10:10 PM
10:45 PM
11:20 PM
11:55 PM
12:30 AM
1:05 AM
1:40 AM
2:15 AM
2:50 AM
3:25 AM
10/11/2021
10/12/2021
Dysart PM10
Dysart Wind Speed


5-Minute PM10 and Wind Speed at Mesa
PM10 (µg/m3)
Wind Speed (MPH)
1,600
1,400
1,200
1,000
800
600
400
200
0
20
18
16
14
12
10
8
6
4
2
0
2:00 PM
2:35 PM
3:10 PM
3:45 PM
4:20 PM
4:55 PM
5:30 PM
6:05 PM
6:40 PM
7:15 PM
7:50 PM
8:25 PM
9:00 PM
9:35 PM
10:10 PM
10:45 PM
11:20 PM
11:55 PM
12:30 AM
1:05 AM
1:40 AM
2:15 AM
2:50 AM
3:25 AM
10/11/2021
10/12/2021
Mesa PM10
Mesa Wind Speed

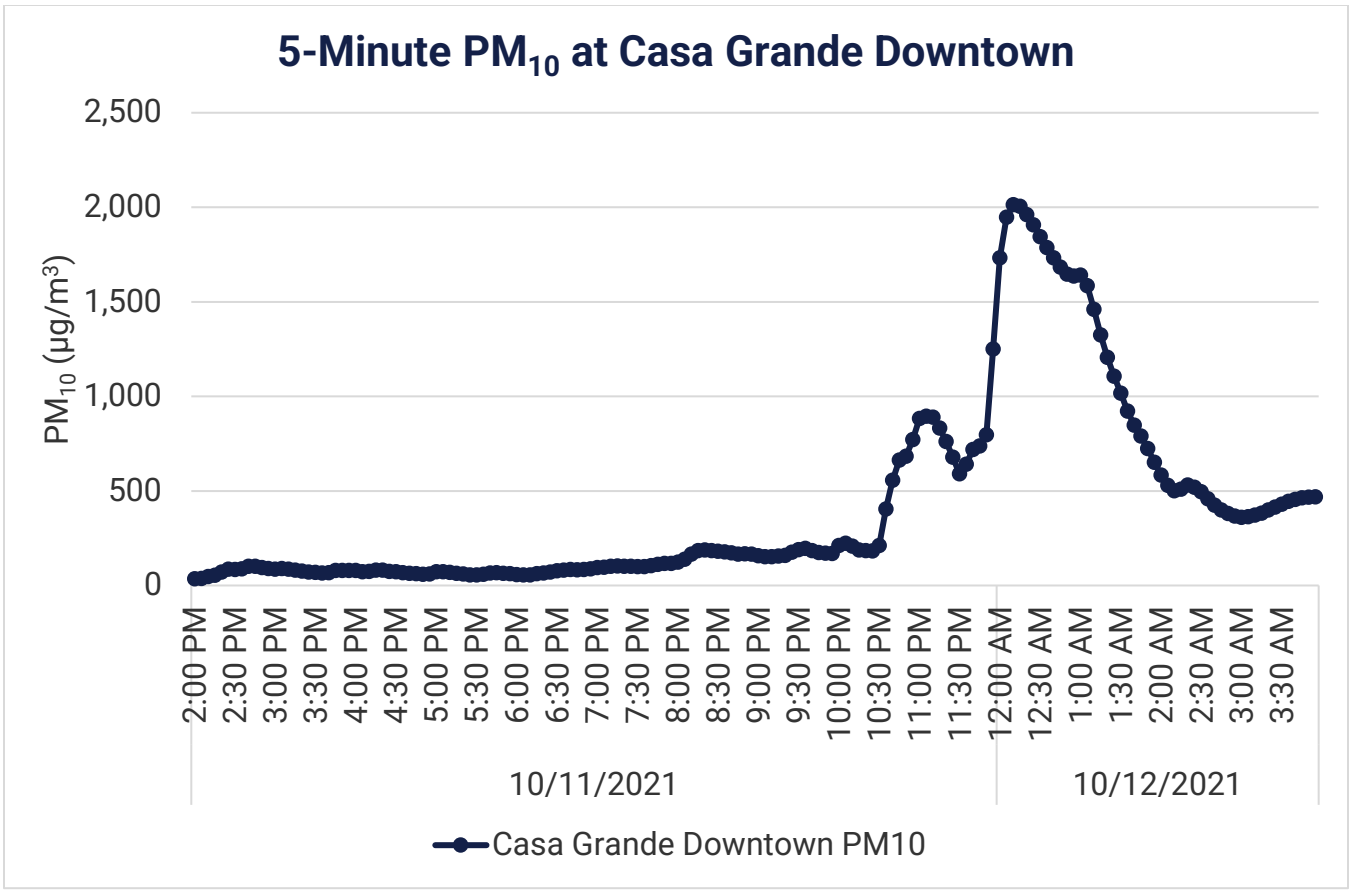

5-Minute PM10 and Wind Speed at South Scottsdale
PM10 (µg/m3)
Wind Speed (MPH)
1,200
1,000
800
600
400
200
0
25
20
15
10
5
0
2:00 PM
2:35 PM
3:10 PM
3:45 PM
4:20 PM
4:55 PM
5:30 PM
6:05 PM
6:40 PM
7:15 PM
7:50 PM
8:25 PM
9:00 PM
9:35 PM
10:10 PM
10:45 PM
11:20 PM
11:55 PM
12:30 AM
1:05 AM
1:40 AM
2:15 AM
2:50 AM
3:25 AM
10/11/2021
10/12/2021
South Scottsdale PM10
South Scottsdale Wind Speed

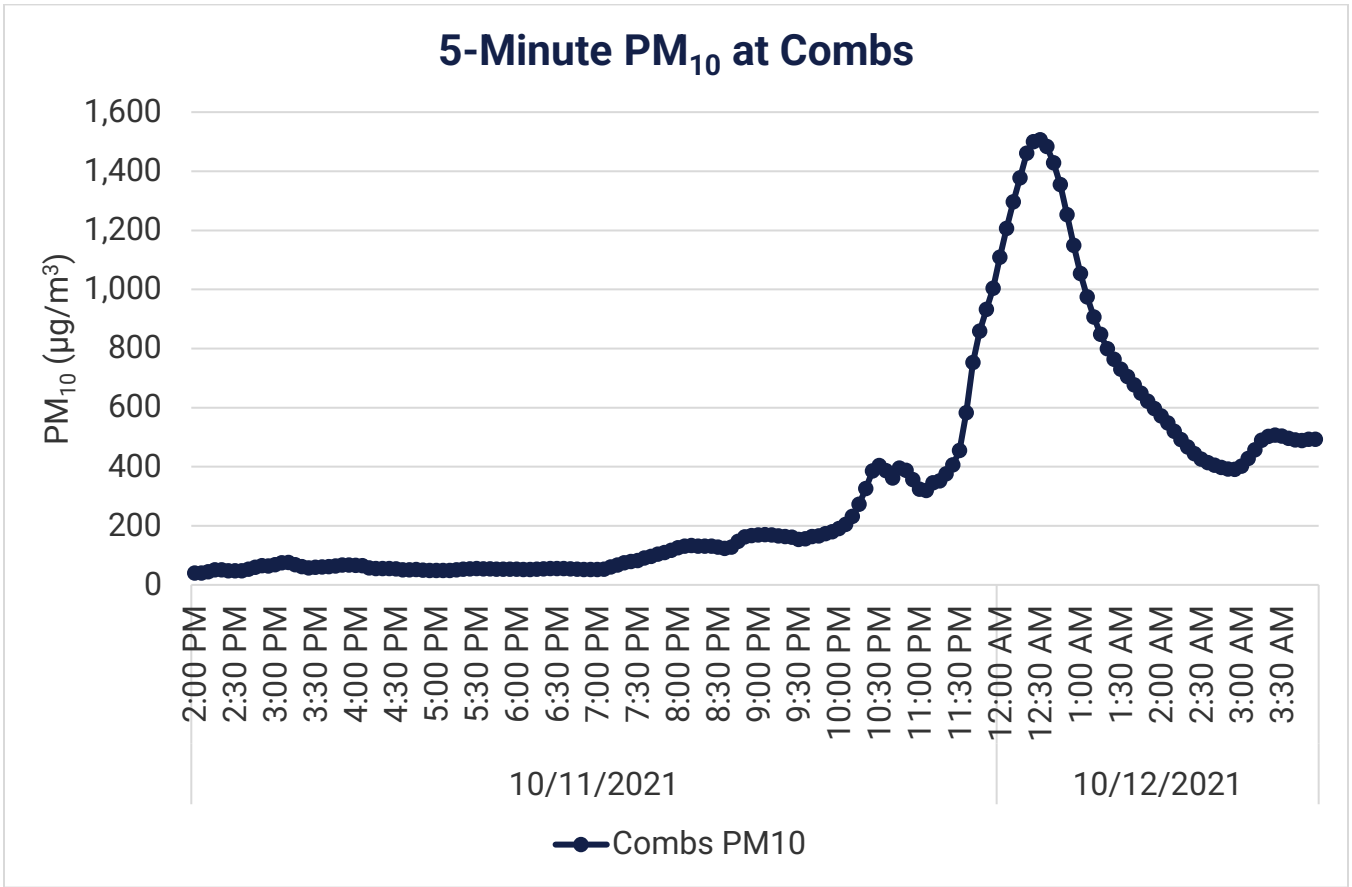

5-Minute PM10 and Wind Speed at Tempe
PM10 (µg/m3)
Wind Speed (MPH)
1,400
1,200
1,000
800
600
400
200
0
14
12
10
8
6
4
2
0
2:00 PM
2:35 PM
3:10 PM
3:45 PM
4:20 PM
4:55 PM
5:30 PM
6:05 PM
6:40 PM
7:15 PM
7:50 PM
8:25 PM
9:00 PM
9:35 PM
10:10 PM
10:45 PM
11:20 PM
11:55 PM
12:30 AM
1:05 AM
1:40 AM
2:15 AM
2:50 AM
3:25 AM
10/11/2021
10/12/2021
Tempe PM10
Tempe Wind Speed

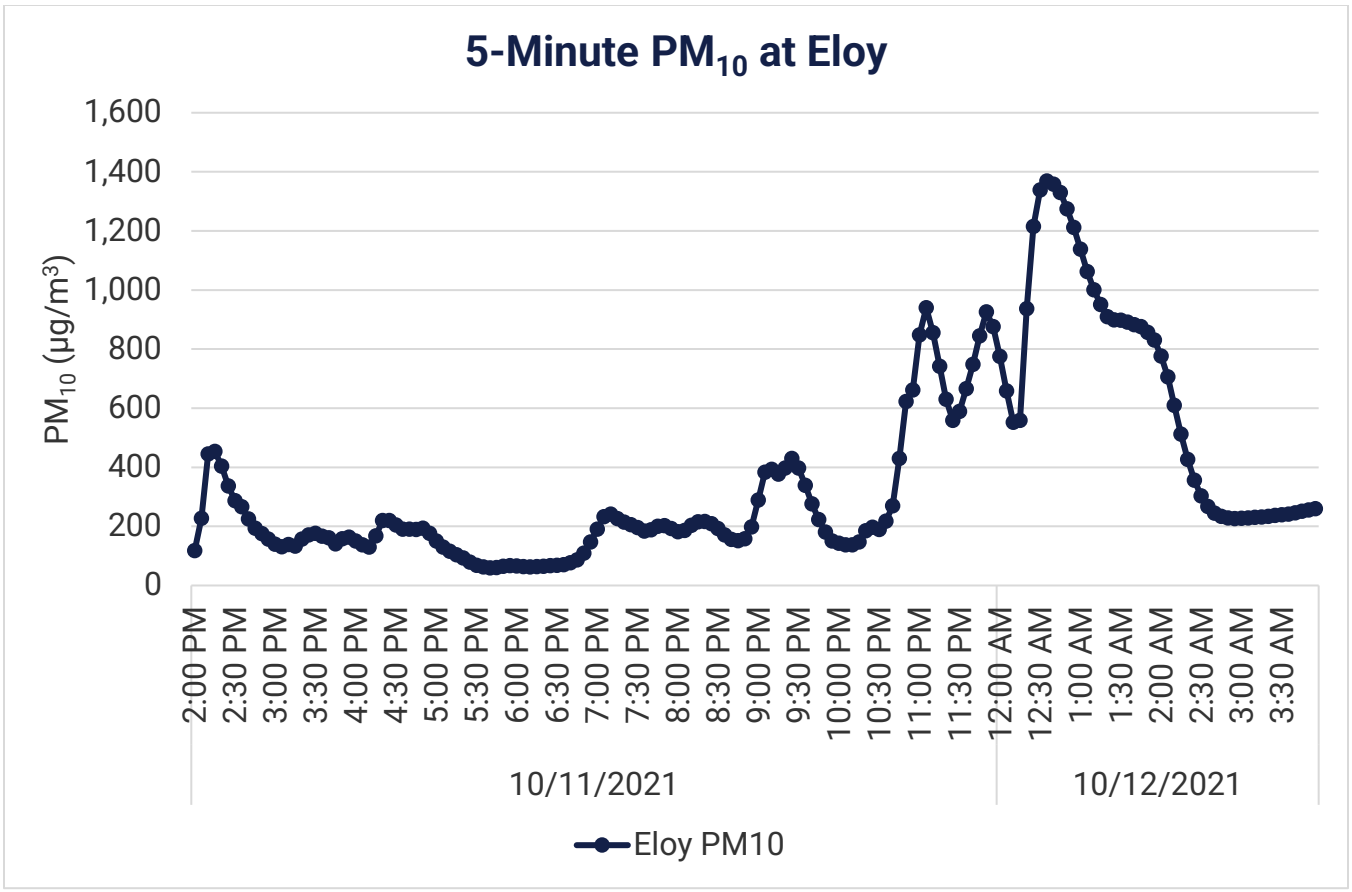


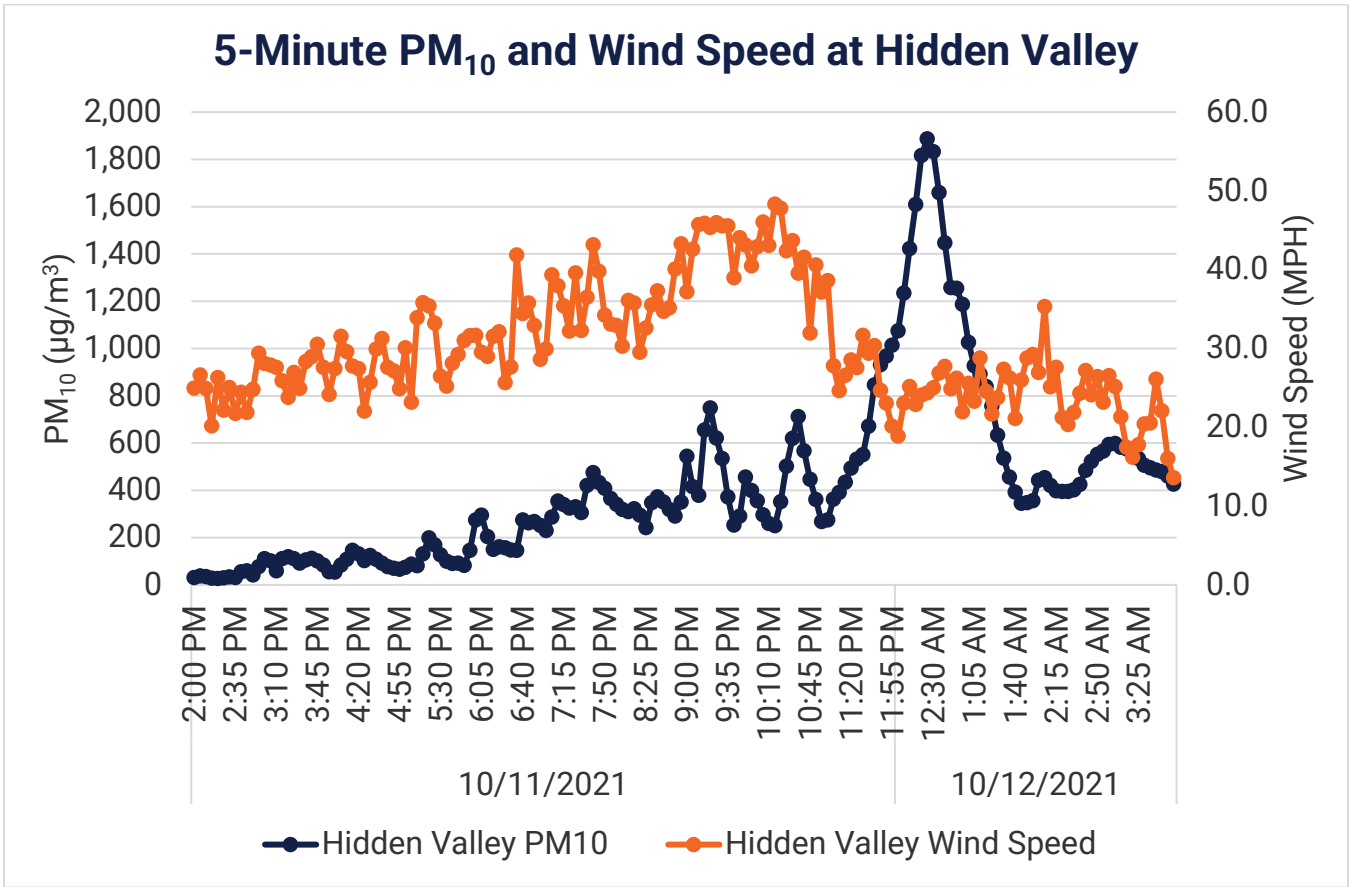


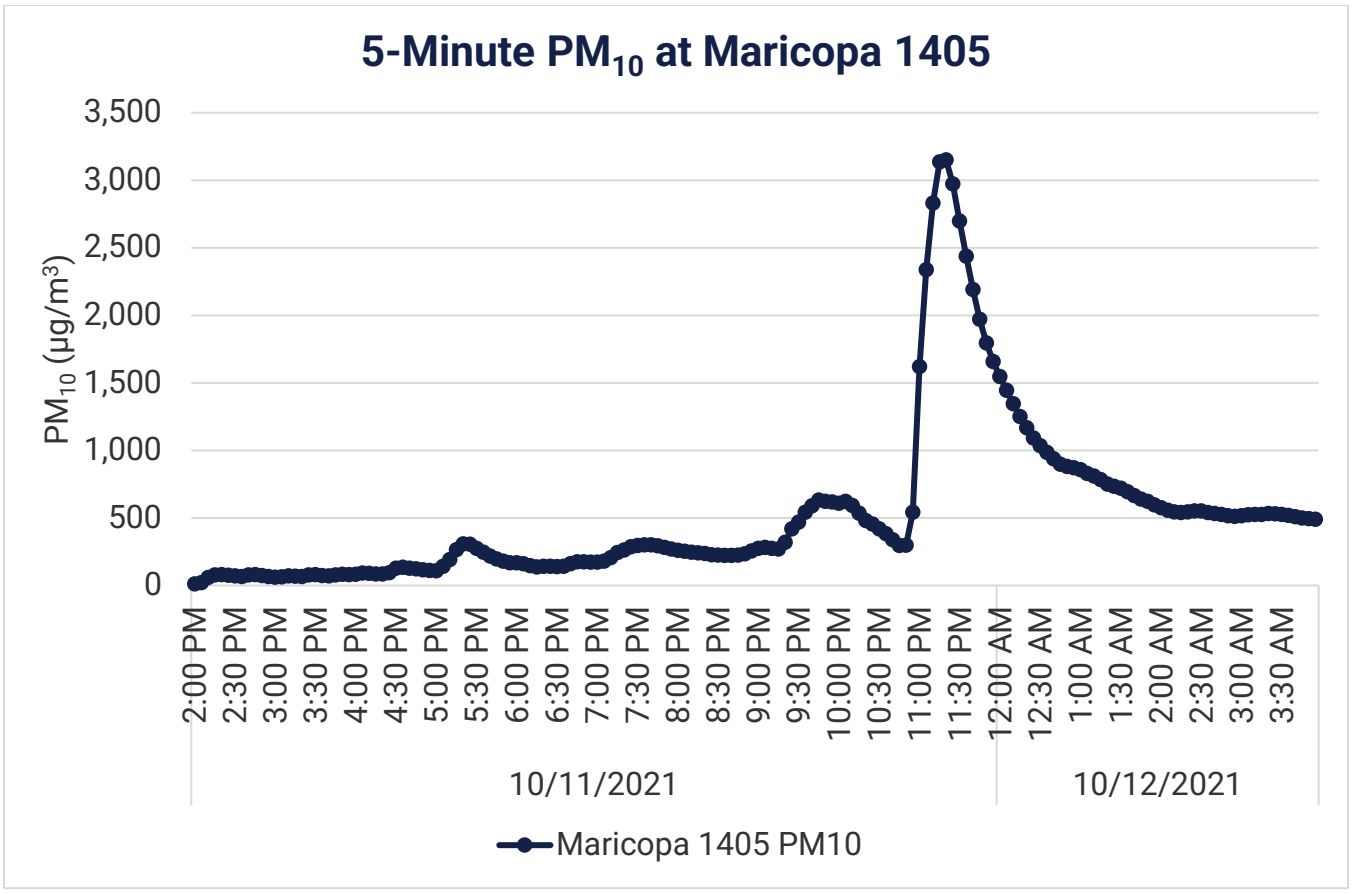
Note: 5-minute PM10 data at Apache Junction were not valid for this time period.

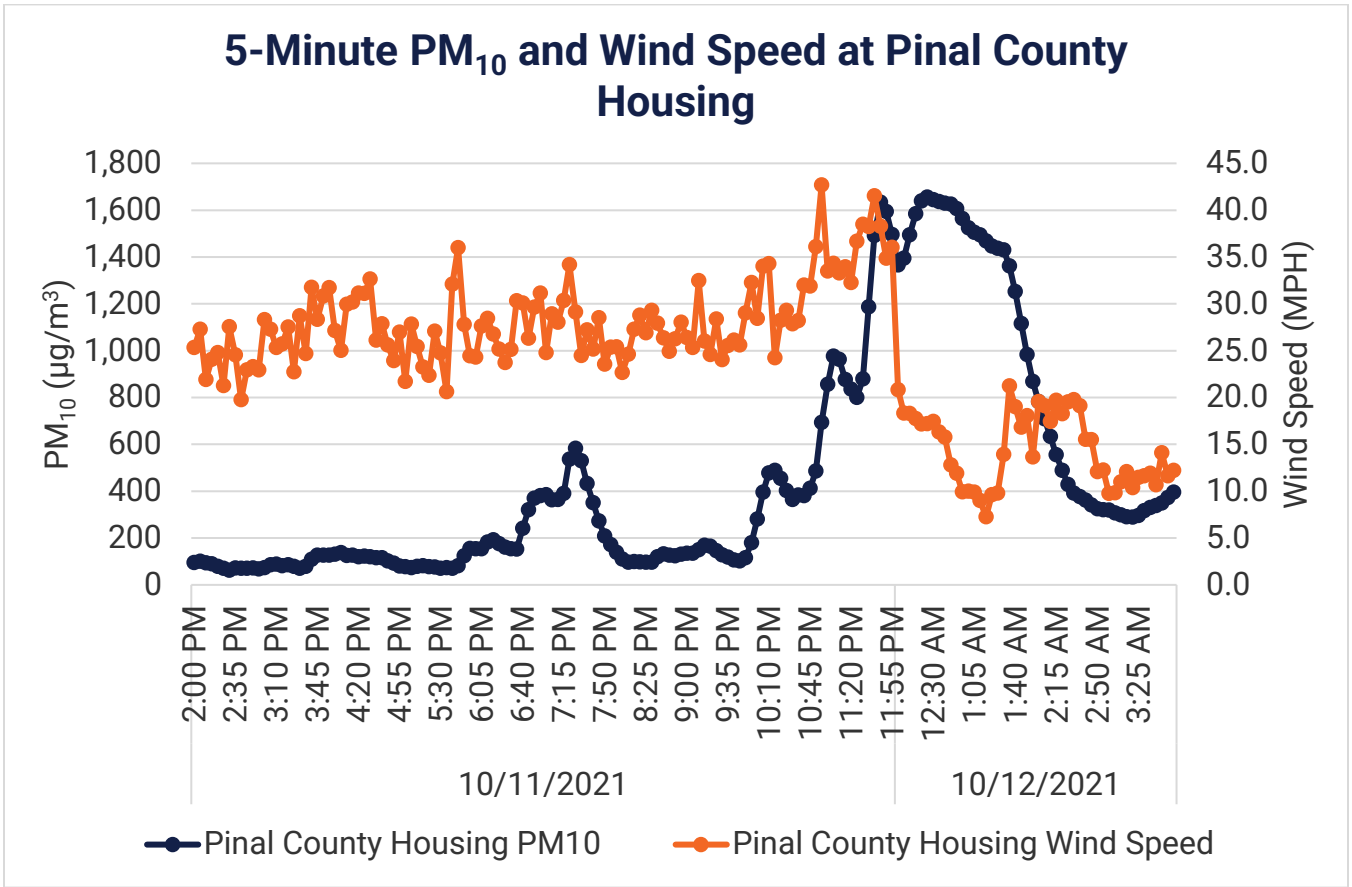

5-Minute PM10 at Casa Grande Downtown
2,500
2,000
1,500
1,000
500
0
PM10 (µg/m3)
2:00 PM
2:30 PM
3:00 PM
3:30 PM
4:00 PM
4:30 PM
5:00 PM
5:30 PM
6:00 PM
6:30 PM
7:00 PM
7:30 PM
8:00 PM
8:30 PM
9:00 PM
9:30 PM
10:00 PM
10:30 PM
11:00 PM
11:30 PM
12:00 AM
12:30 AM
1:00 AM
1:30 AM
2:00 AM
2:30 AM
3:00 AM
3:30 AM
10/11/2021
10/12/2021
Casa Grande Downtown PM10

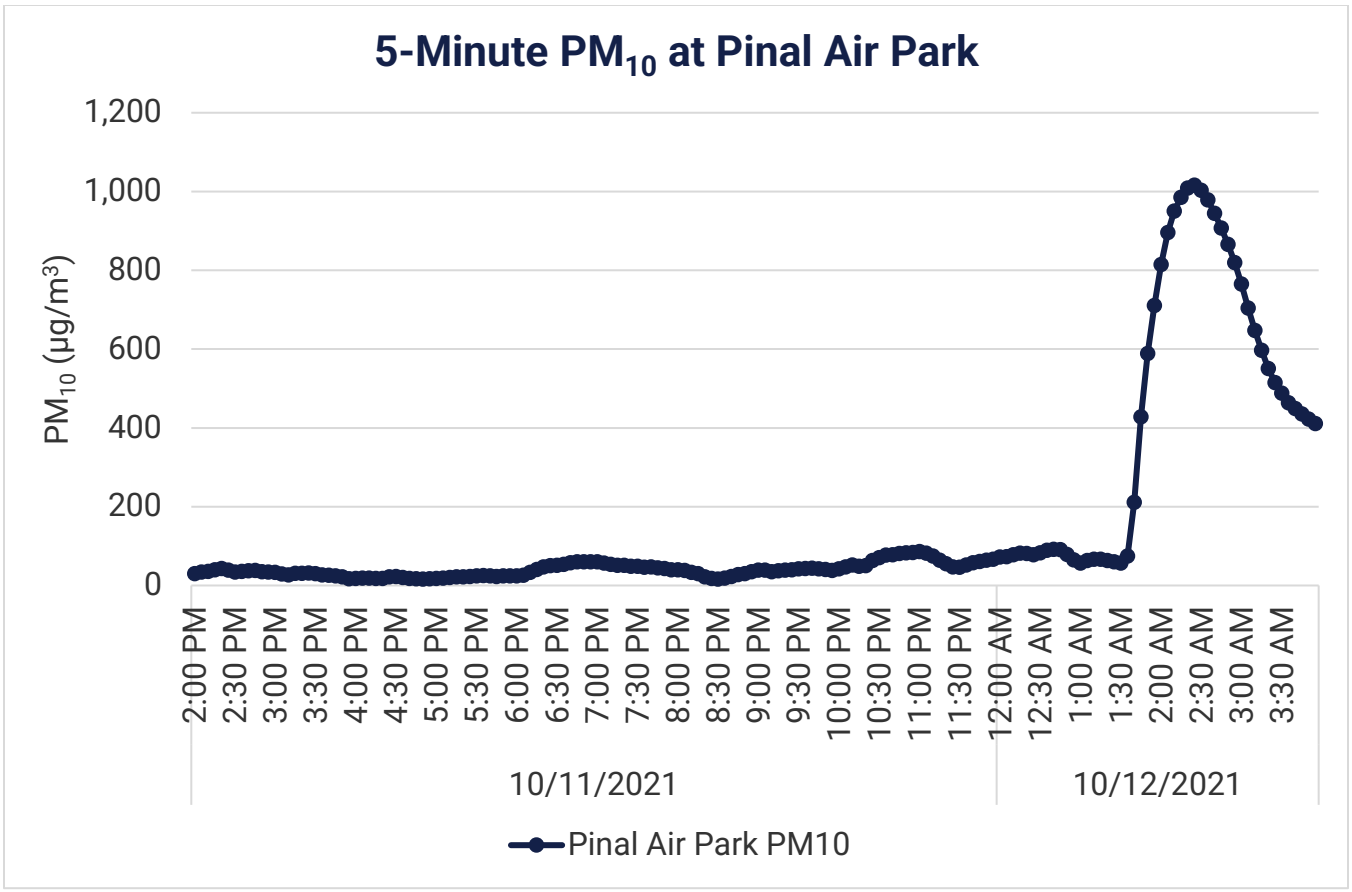

5-Minute PM10 at Combs
1,600
1,400
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
2:00 PM
2:30 PM
3:00 PM
3:30 PM
4:00 PM
4:30 PM
5:00 PM
5:30 PM
6:00 PM
6:30 PM
7:00 PM
7:30 PM
8:00 PM
8:30 PM
9:00 PM
9:30 PM
10:00 PM
10:30 PM
11:00 PM
11:30 PM
12:00 AM
12:30 AM
1:00 AM
1:30 AM
2:00 AM
2:30 AM
3:00 AM
3:30 AM
10/11/2021
10/12/2021
Combs PM10

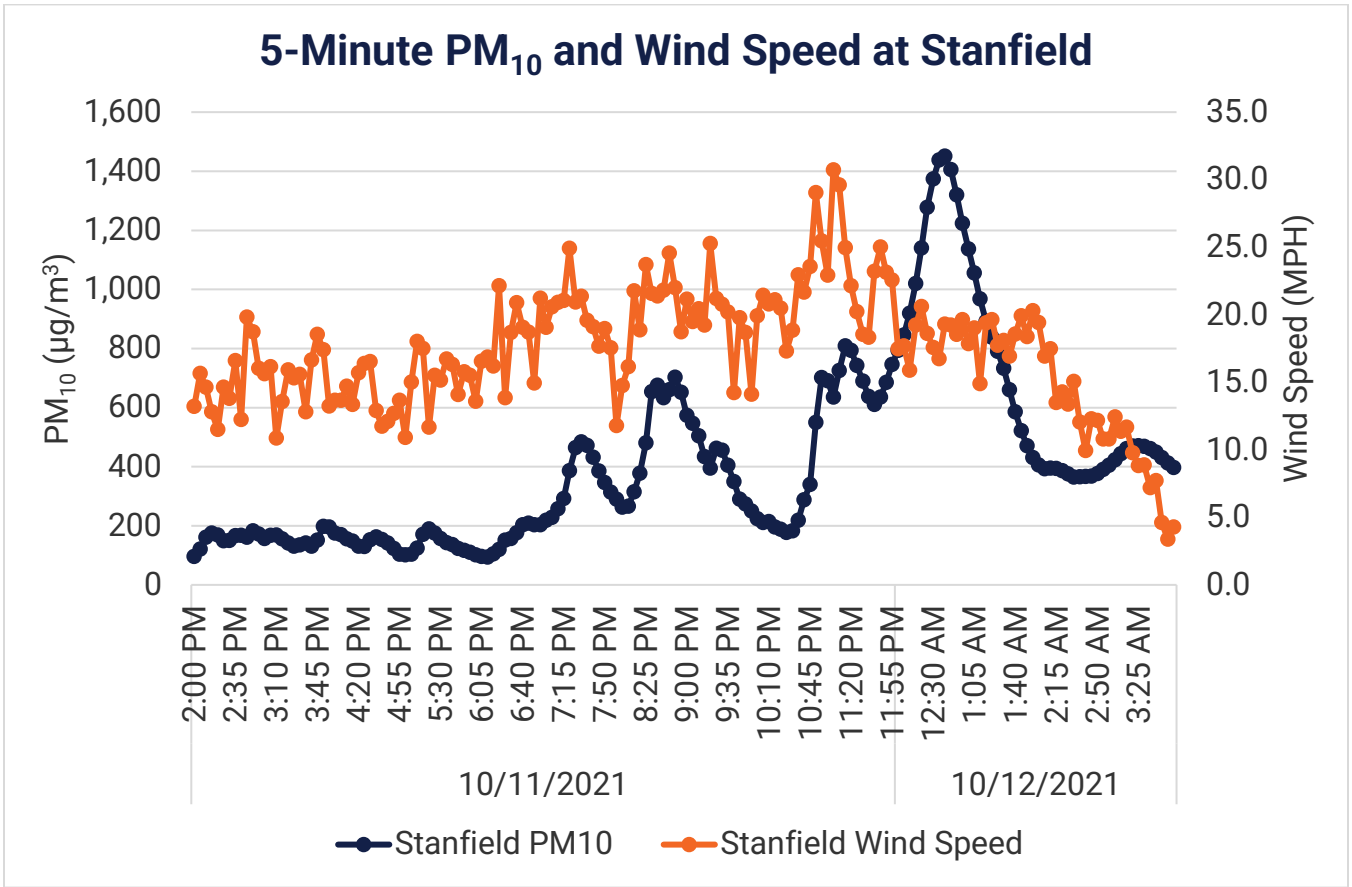

5-Minute PM10 at Eloy
PM10 (µg/m3)
1,600
1,400
1,200
1,000
800
600
400
200
0
2:00 PM
2:30 PM
3:00 PM
3:30 PM
4:00 PM
4:30 PM
5:00 PM
5:30 PM
6:00 PM
6:30 PM
7:00 PM
7:30 PM
8:00 PM
8:30 PM
9:00 PM
9:30 PM
10:00 PM
10:30 PM
11:00 PM
11:30 PM
12:00 AM
12:30 AM
1:00 AM
1:30 AM
2:00 AM
2:30 AM
3:00 AM
3:30 AM
10/11/2021
10/12/2021
Eloy PM10

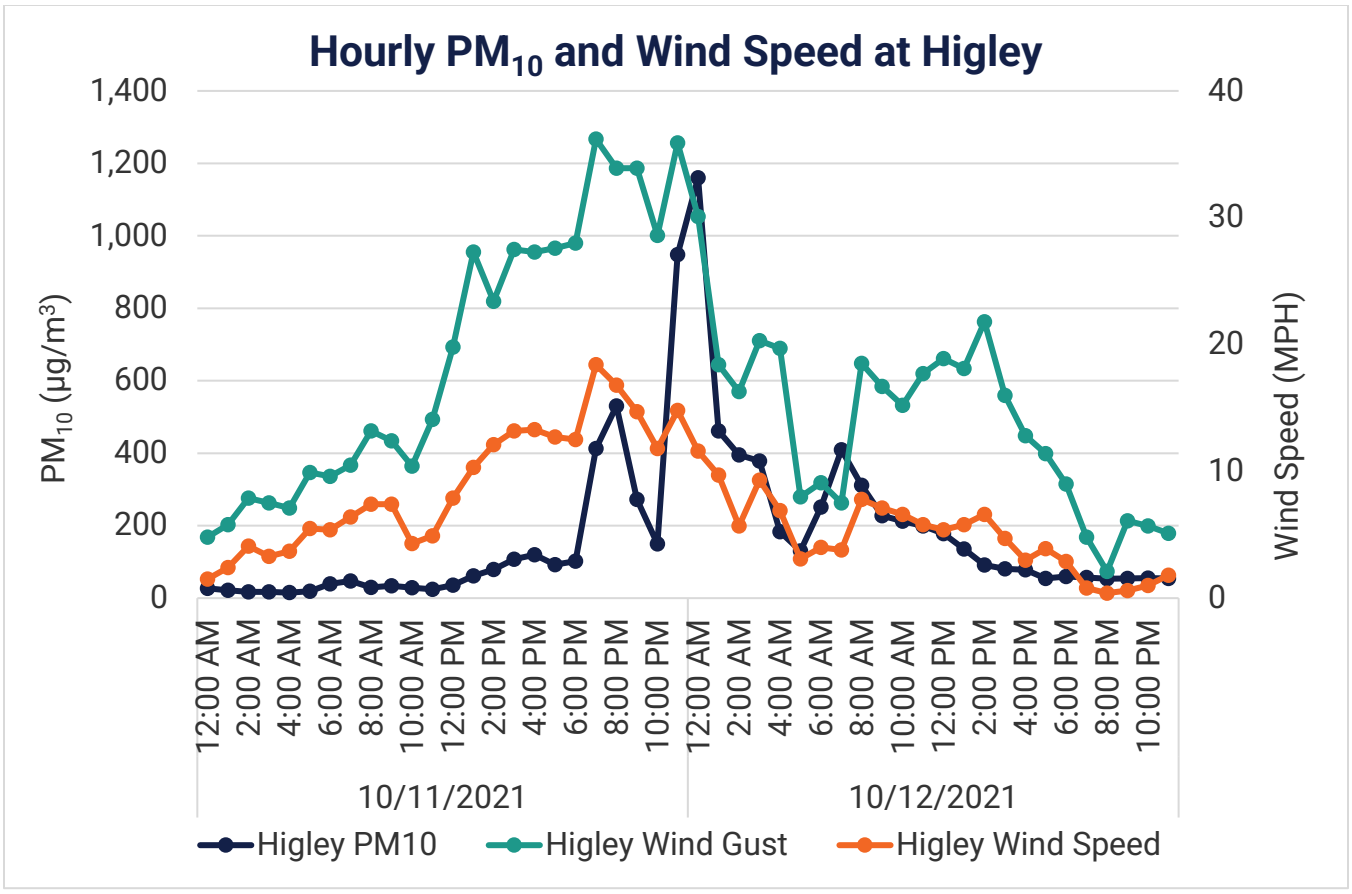

5-Minute PM10 and Wind Speed at Hidden Valley
PM10 (µg/m3)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Wind Speed (MPH)
60.0
50.0
40.0
30.0
20.0
10.0
0.0
2:00 PM
2:35 PM
3:10 PM
3:45 PM
4:20 PM
4:55 PM
5:30 PM
6:05 PM
6:40 PM
7:15 PM
7:50 PM
8:25 PM
9:00 PM
9:35 PM
10:10 PM
10:45 PM
11:20 PM
11:55 PM
12:30 AM
1:05 AM
1:40 AM
2:15 AM
2:50 AM
3:25 AM
10/11/2021
10/12/2021
Hidden Valley PM10
Hidden Valley Wind Speed

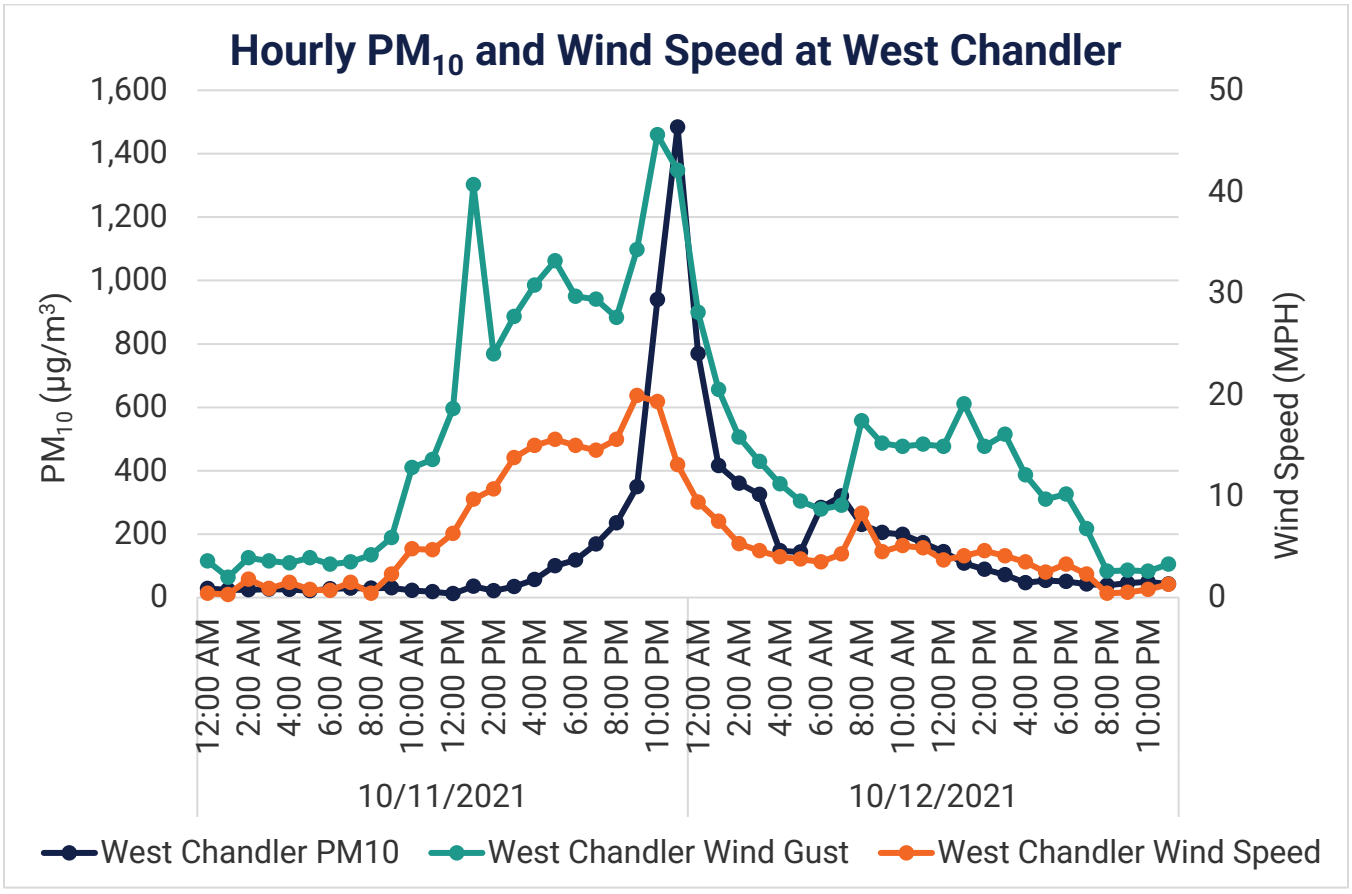

5-Minute PM10 at Maricopa 1405
PM10 (µg/m3)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2:00 PM
2:30 PM
3:00 PM
3:30 PM
4:00 PM
4:30 PM
5:00 PM
5:30 PM
6:00 PM
6:30 PM
7:00 PM
7:30 PM
8:00 PM
8:30 PM
9:00 PM
9:30 PM
10:00 PM
10:30 PM
11:00 PM
11:30 PM
12:00 AM
12:30 AM
1:00 AM
1:30 AM
2:00 AM
2:30 AM
3:00 AM
3:30 AM
10/11/2021
10/12/2021
Maricopa 1405 PM10

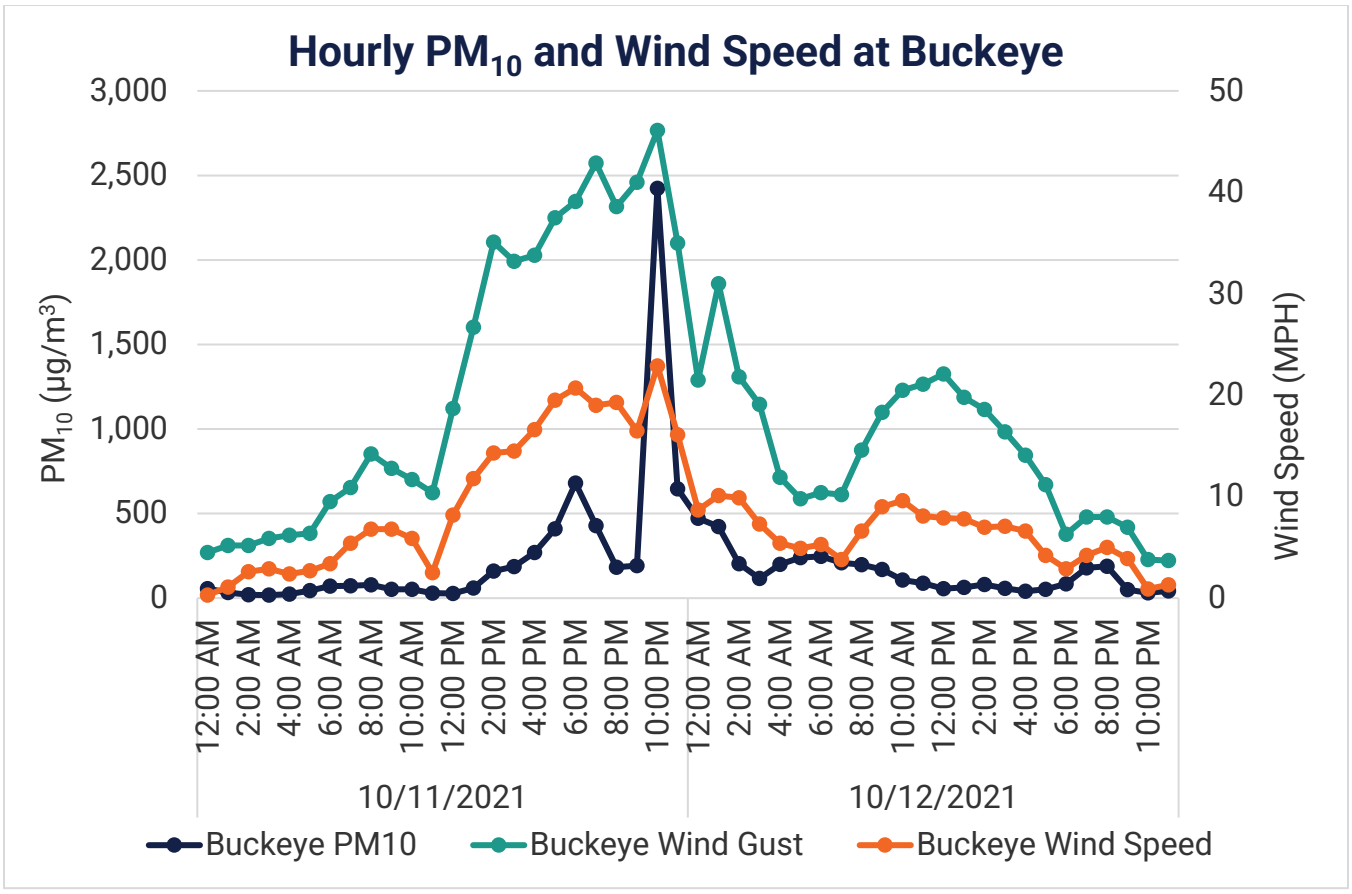

5-Minute PM10 and Wind Speed at Pinal County Housing
PM10 (µg/m3)
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Wind Speed (MPH)
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2:00 PM
2:35 PM
3:10 PM
3:45 PM
4:20 PM
4:55 PM
5:30 PM
6:05 PM
6:40 PM
7:15 PM
7:50 PM
8:25 PM
9:00 PM
9:35 PM
10:10 PM
10:45 PM
11:20 PM
11:55 PM
12:30 AM
1:05 AM
1:40 AM
2:15 AM
2:50 AM
3:25 AM
10/11/2021
10/12/2021
Pinal County Housing PM10
Pinal County Housing Wind Speed

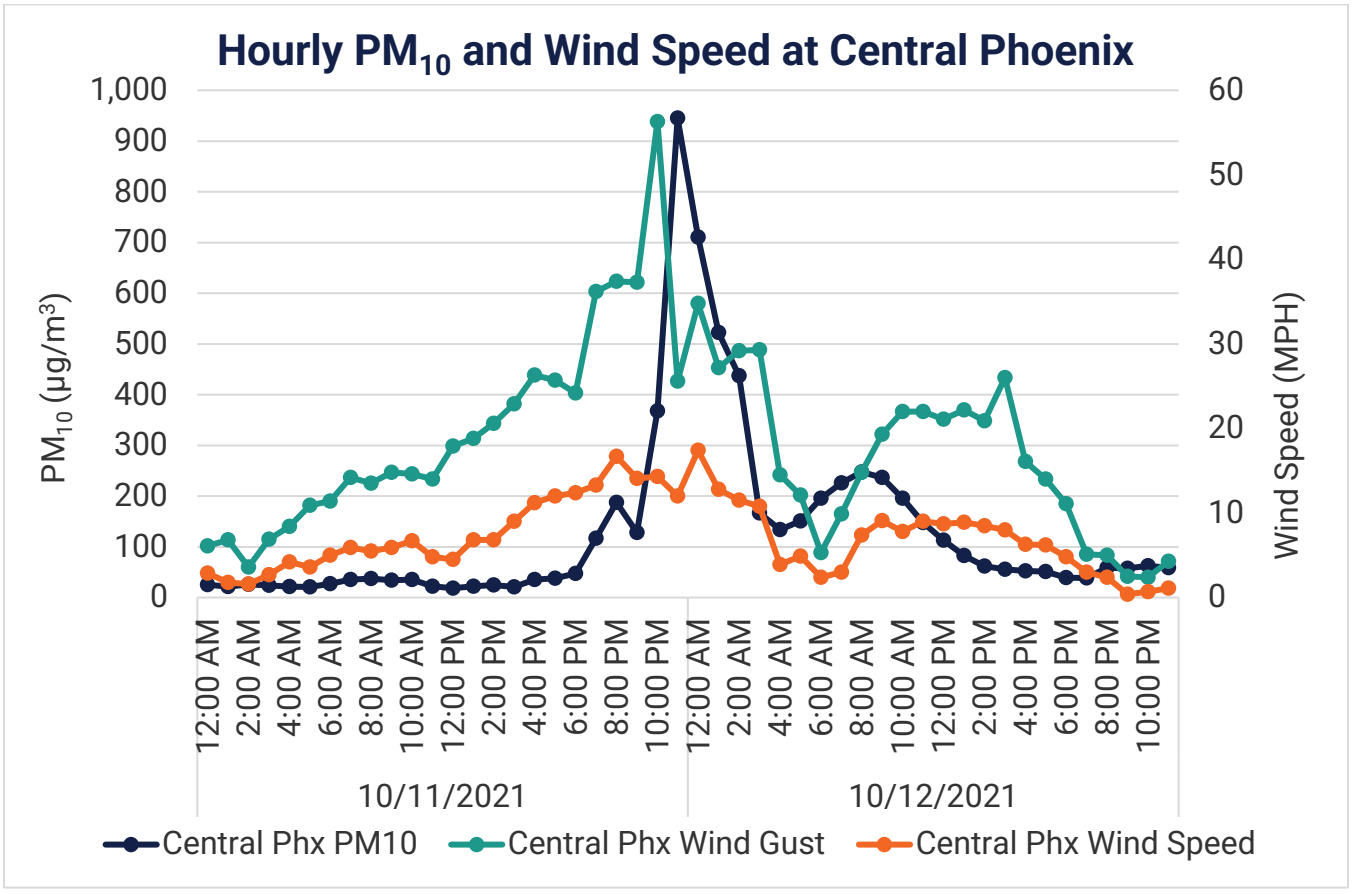

5-Minute PM10 at Pinal Air Park
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
2:00 PM
2:30 PM
3:00 PM
3:30 PM
4:00 PM
4:30 PM
5:00 PM
5:30 PM
6:00 PM
6:30 PM
7:00 PM
7:30 PM
8:00 PM
8:30 PM
9:00 PM
9:30 PM
10:00 PM
10:30 PM
11:00 PM
11:30 PM
12:00 AM
12:30 AM
1:00 AM
1:30 AM
2:00 AM
2:30 AM
3:00 AM
3:30 AM
10/11/2021
10/12/2021
Pinal Air Park PM10

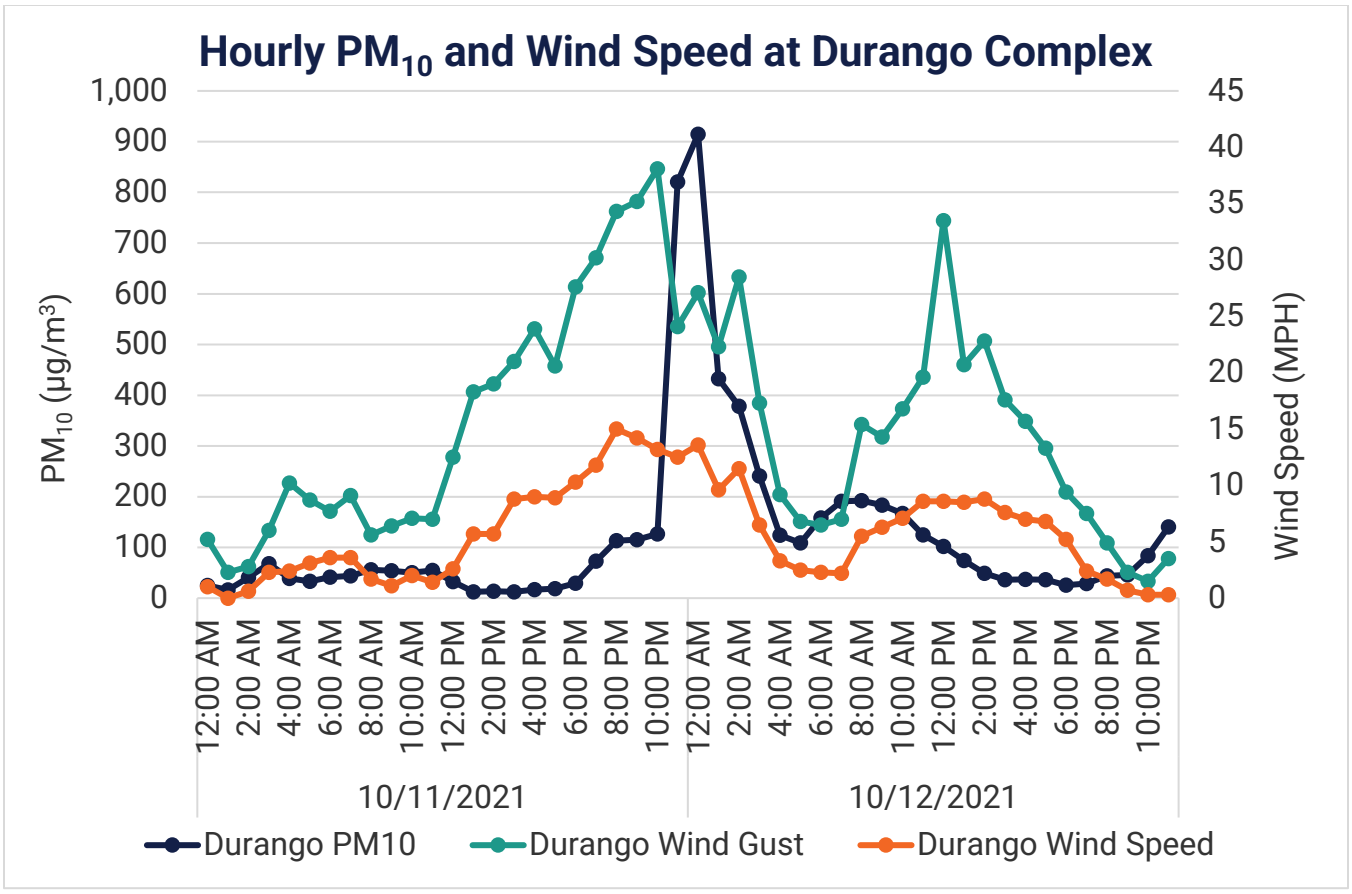

5-Minute PM10 and Wind Speed at Stanfield
1,600
1,400
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Wind Speed (MPH)
2:00 PM
2:35 PM
3:10 PM
3:45 PM
4:20 PM
4:55 PM
5:30 PM
6:05 PM
6:40 PM
7:15 PM
7:50 PM
8:25 PM
9:00 PM
9:35 PM
10:10 PM
10:45 PM
11:20 PM
11:55 PM
12:30 AM
1:05 AM
1:40 AM
2:15 AM
2:50 AM
3:25 AM
10/11/2021
10/12/2021
Stanfield PM10
Stanfield Wind Speed

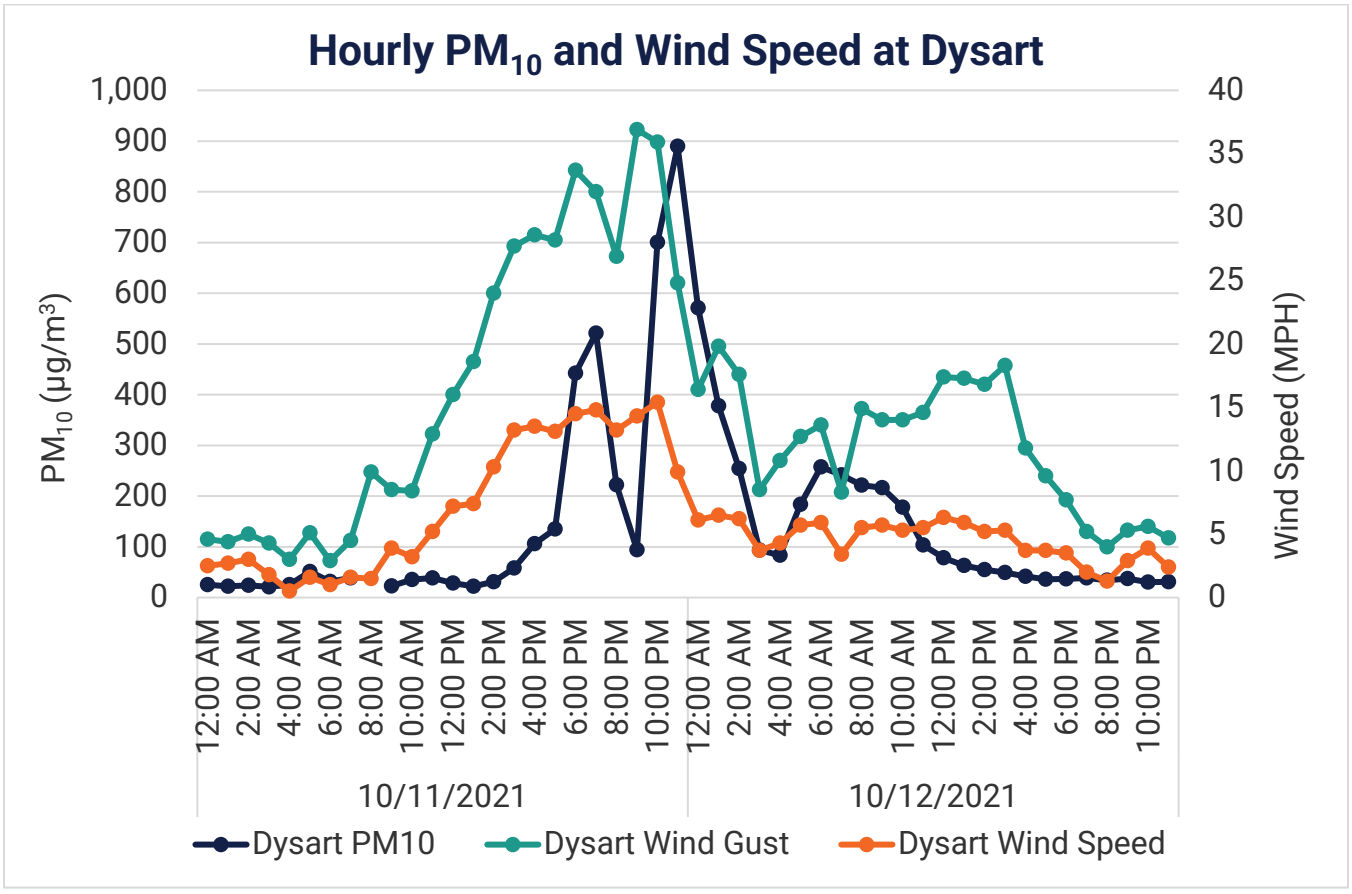

Hourly PM10 and Wind Speed at Higley
PM10 (µg/m3)
Wind Speed (MPH)
1,400
1,200
1,000
800
600
400
200
0
40
30
20
10
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Higley PM10
Higley Wind Gust
Higley Wind Speed

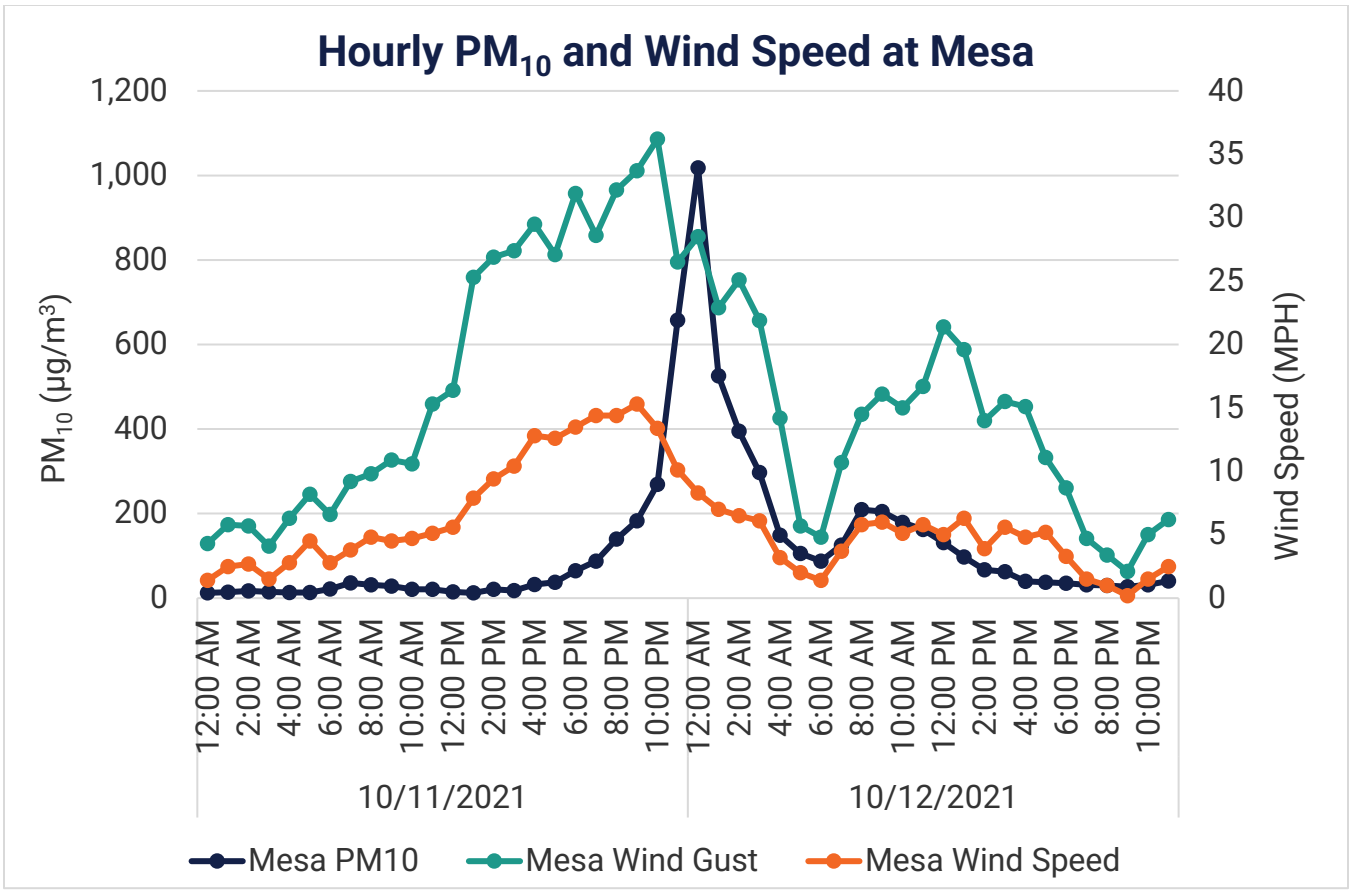

Hourly PM10 and Wind Speed at West Chandler
PM10 (µg/m3)
Wind Speed (MPH)
1,600
1,400
1,200
1,000
800
600
400
200
0
50
40
30
20
10
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
West Chandler PM10
West Chandler Wind Gust
West Chandler Wind Speed

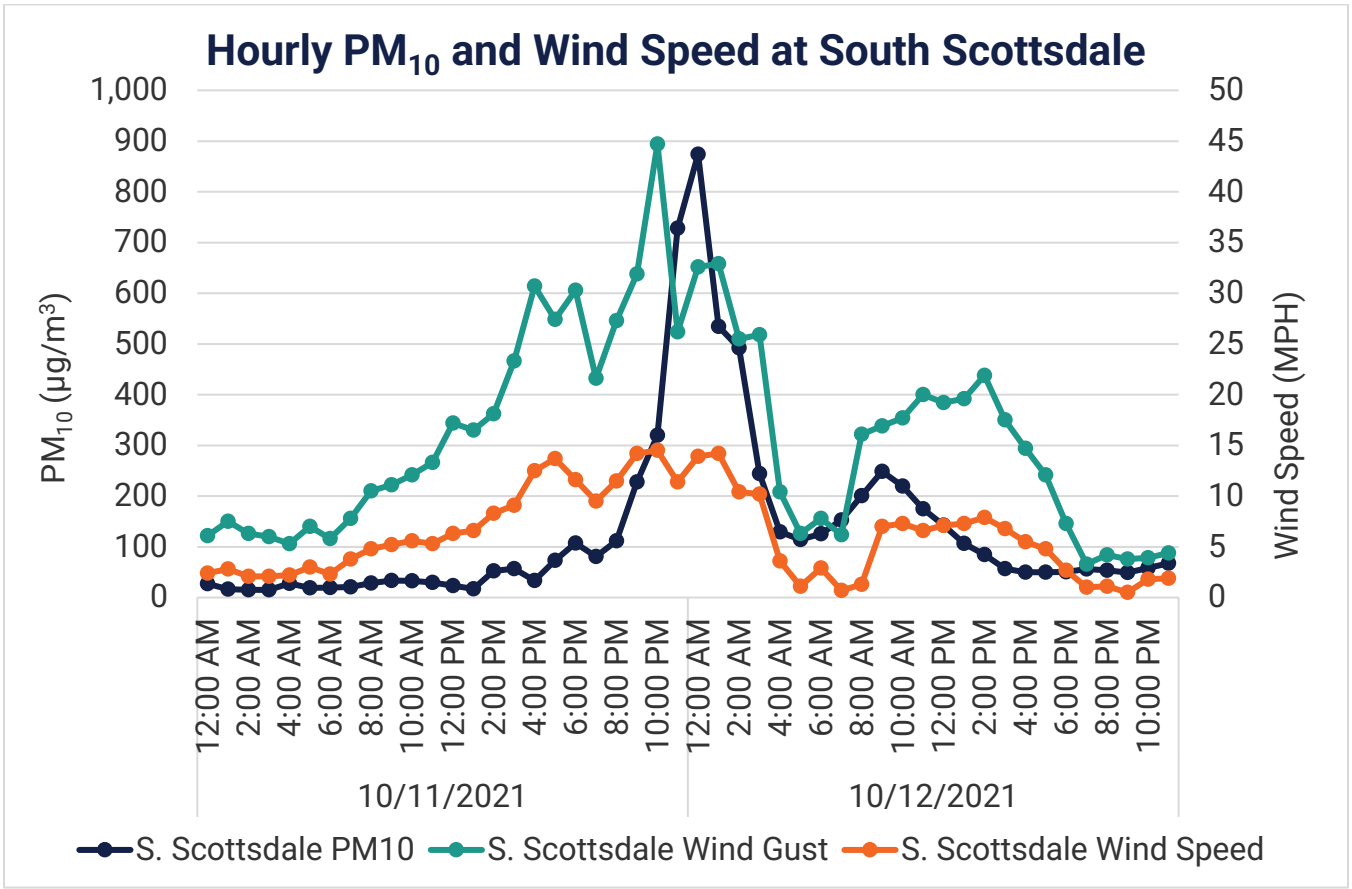

Hourly PM10 and Wind Speed at Buckeye
PM10 (µg/m3)
Wind Speed (MPH)
3,000
2,500
2,000
1,500
1,000
500
0
50
40
30
20
10
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Buckeye PM10
Buckeye Wind Gust
Buckeye Wind Speed

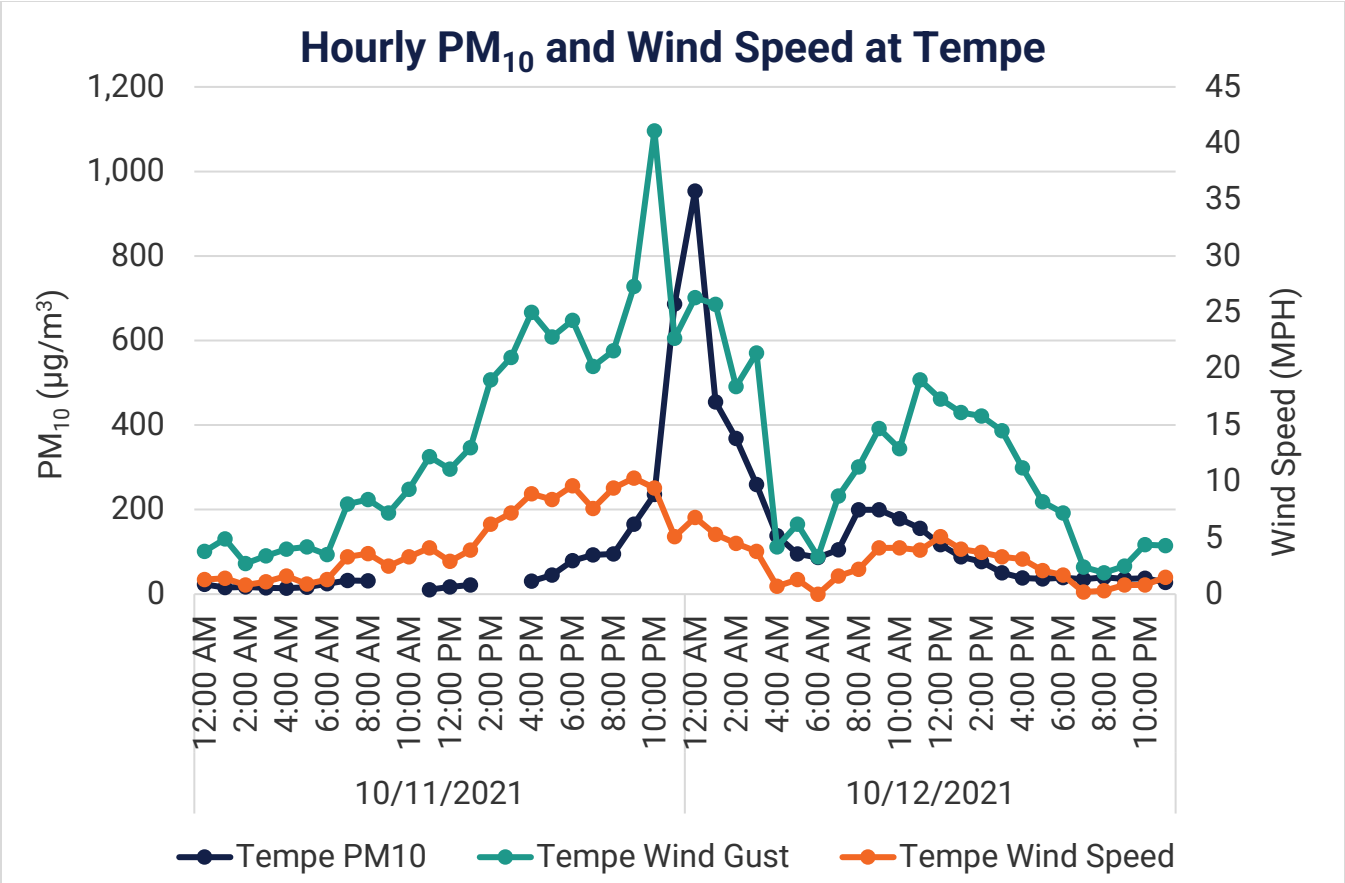

Hourly PM10 and Wind Speed at Central Phoenix
PM10 (µg/m3)
Wind Speed (MPH)
1,000
900
800
700
600
500
400
300
200
100
0
60
50
40
30
20
10
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Central Phx PM10
Central Phx Wind Gust
Central Phx Wind Speed

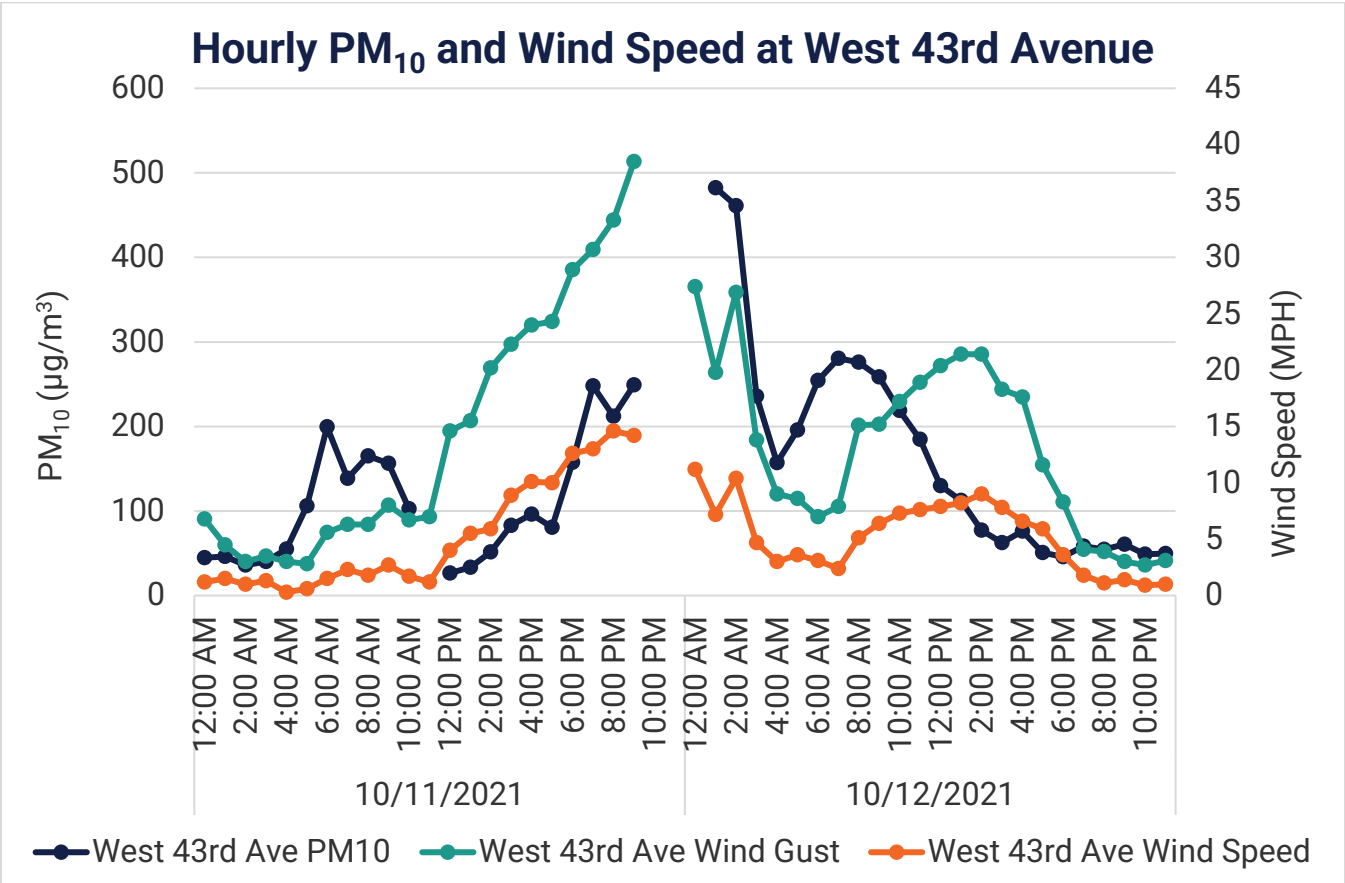

Hourly PM10 and Wind Speed at Durango Complex
PM10 (µg/m3)
Wind Speed (MPH)
1,000
900
800
700
600
500
400
300
200
100
0
45
40
35
30
25
20
15
10
5
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Durango PM10
Durango Wind Gust
Durango Wind Speed

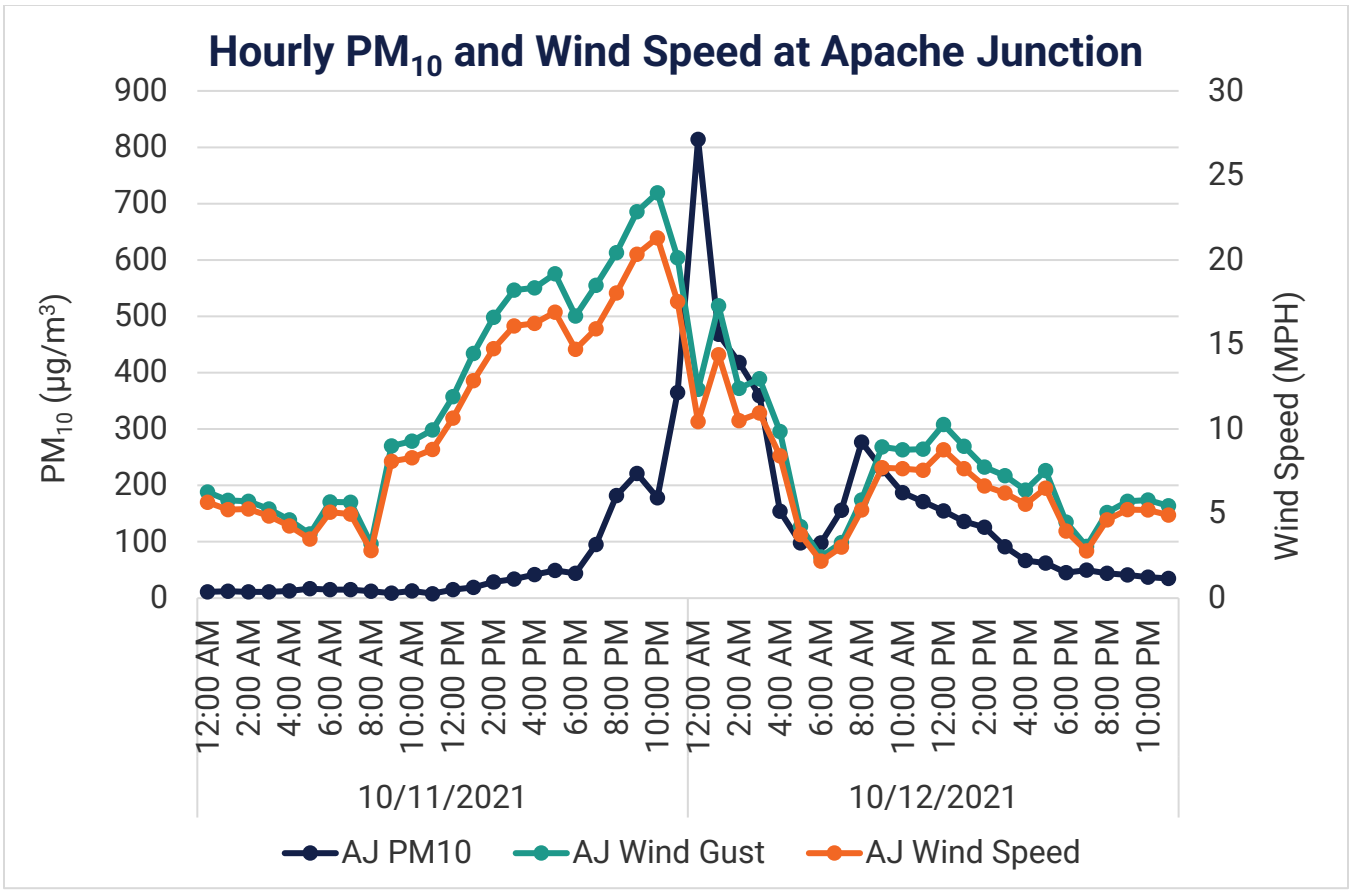

Hourly PM10 and Wind Speed at Dysart
PM10 (µg/m3)
Wind Speed (MPH)
1,000
900
800
700
600
500
400
300
200
100
0
40
35
30
25
20
15
10
5
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Dysart PM10
Dysart Wind Gust
Dysart Wind Speed

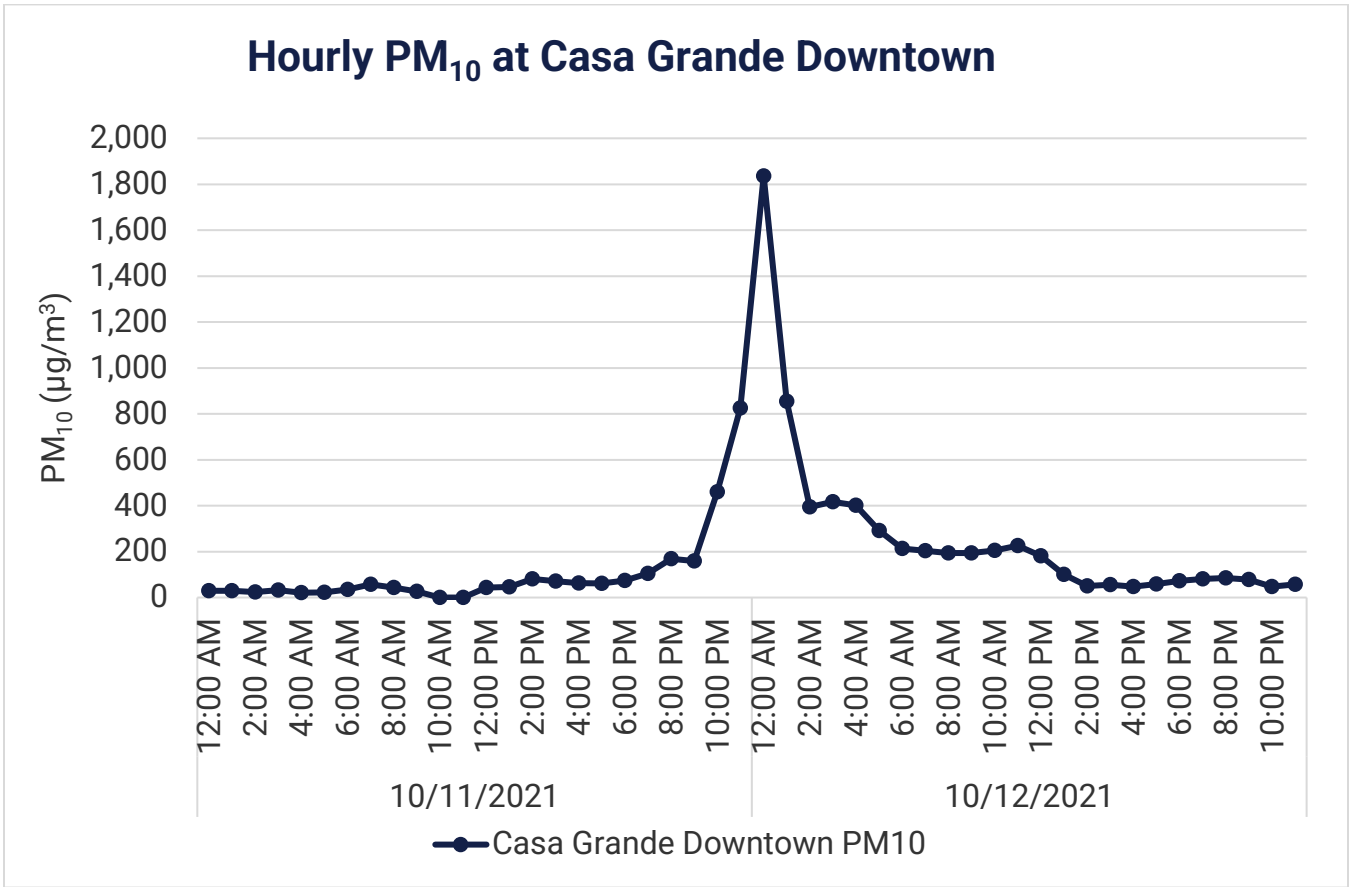

Hourly PM10 and Wind Speed at Mesa
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
40
35
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Mesa PM10
Mesa Wind Gust
Mesa Wind Speed

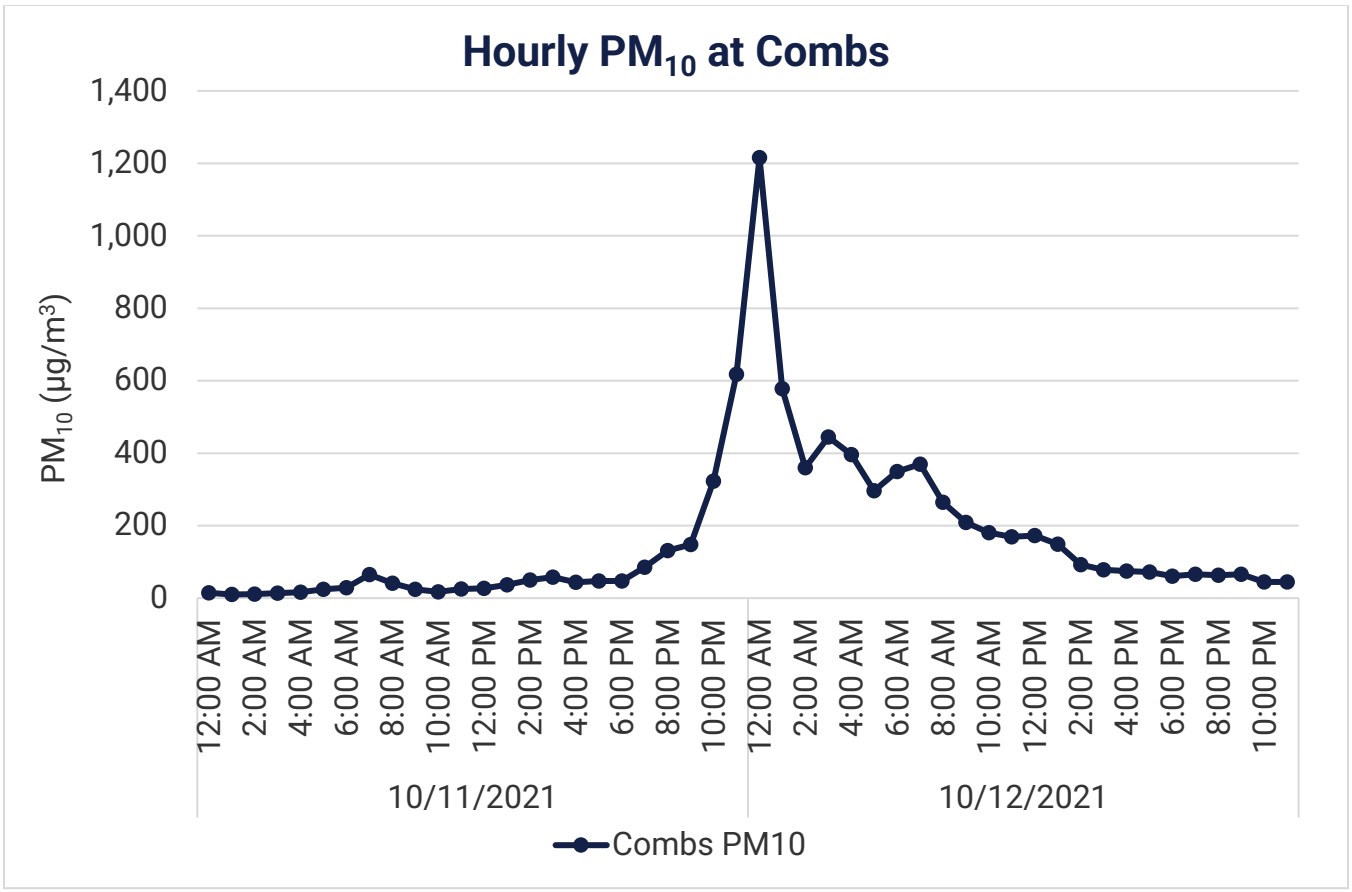

Hourly PM10 and Wind Speed at South Scottsdale
1,000
900
800
700
600
500
400
300
200
100
0
PM10 (µg/m3)
50
45
40
35
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
S. Scottsdale PM10
S. Scottsdale Wind Gust
S. Scottsdale Wind Speed

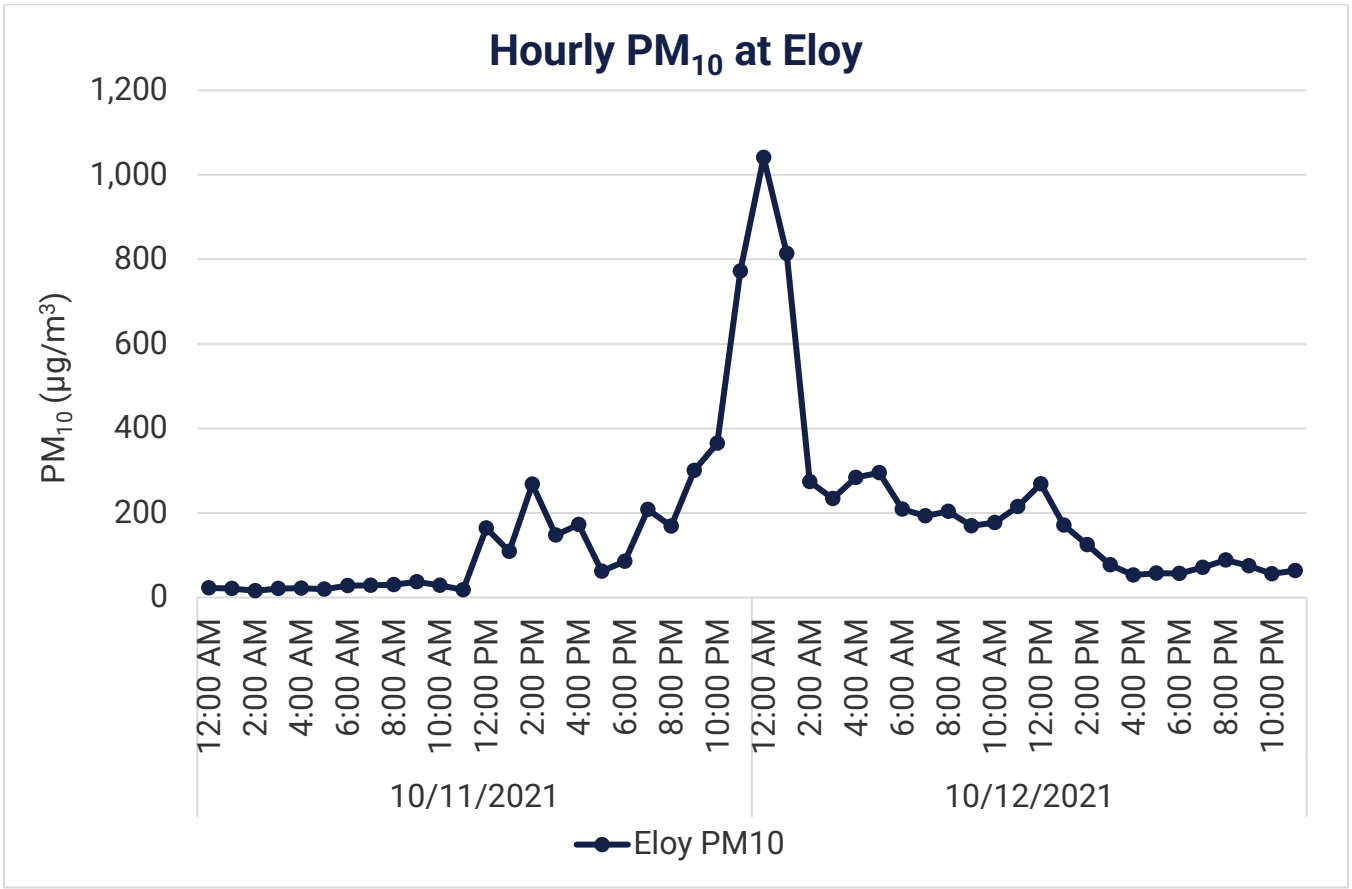

Hourly PM10 and Wind Speed at Tempe
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
45
40
35
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Tempe PM10
Tempe Wind Gust
Tempe Wind Speed

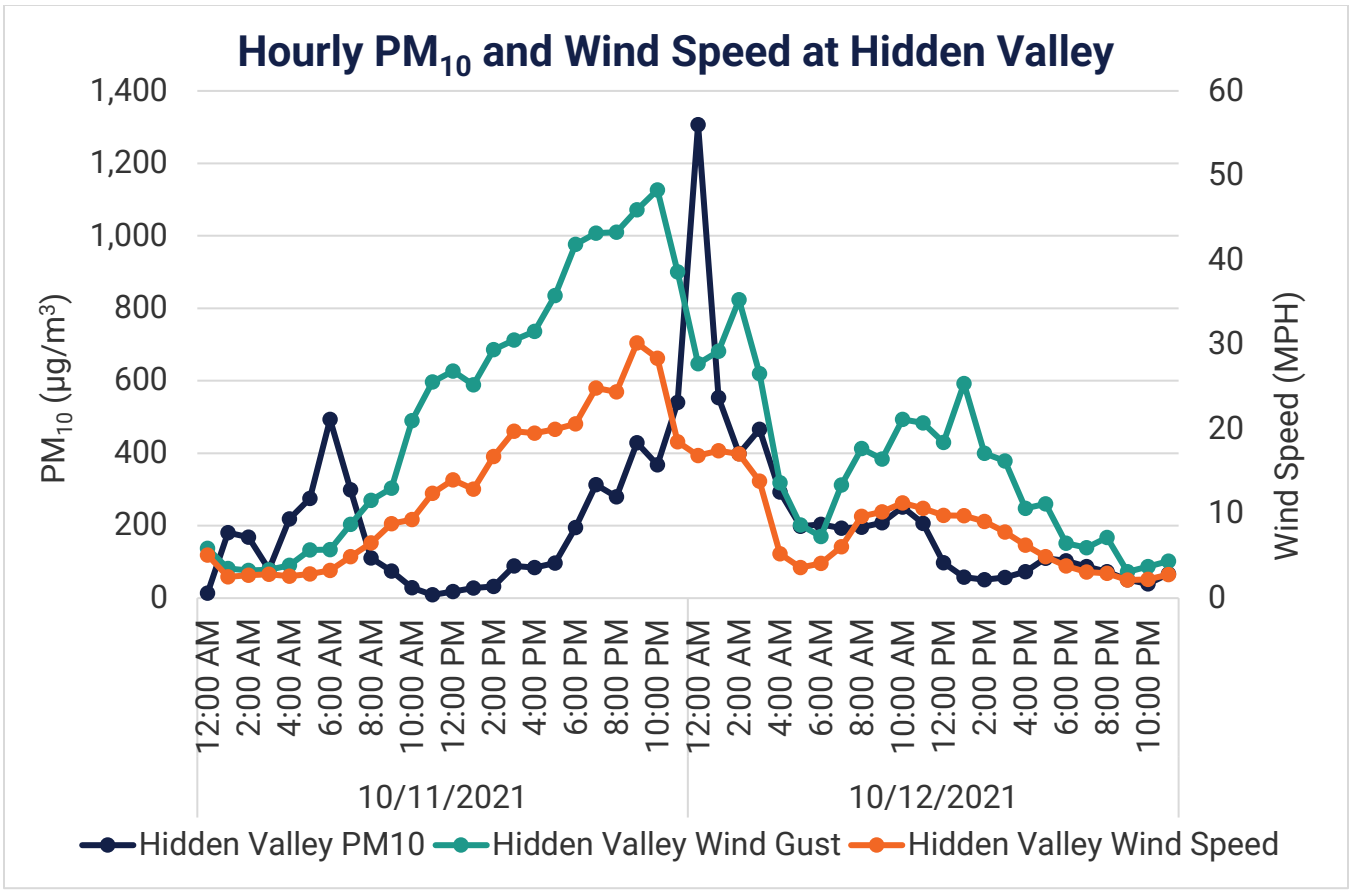

Hourly PM10 and Wind Speed at West 43rd Avenue
600
500
400
300
200
100
0
PM10 (µg/m3)
45
40
35
30
25
20
15
10
5
0
Wind Speed (MPH)
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
West 43rd Ave PM10
West 43rd Ave Wind Gust
West 43rd Ave Wind Speed

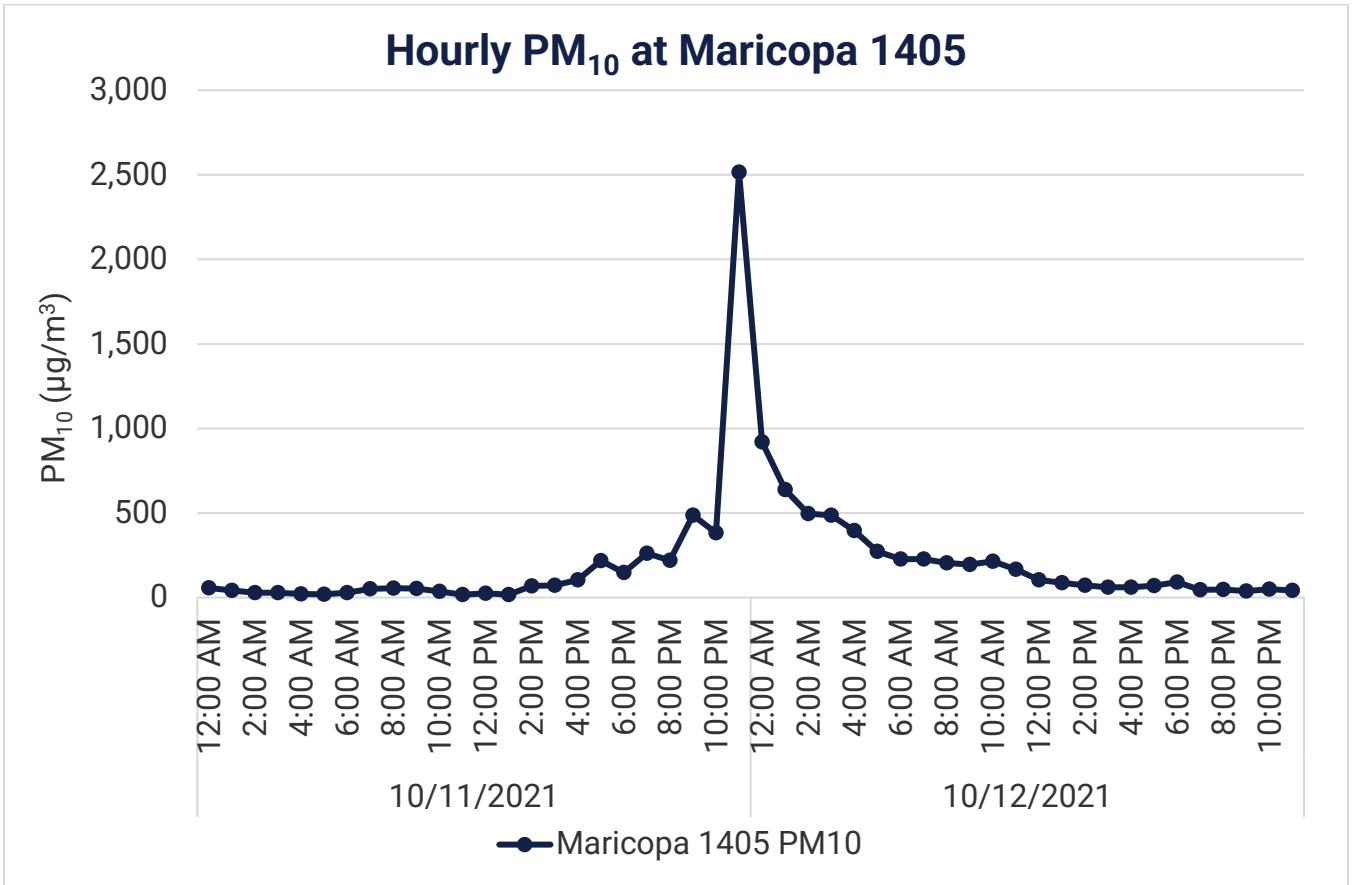

Hourly PM10 and Wind Speed at Apache Junction
PM10 (µg/m3)
Wind Speed (MPH)
900
800
700
600
500
400
300
200
100
0
30
25
20
15
10
5
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
AJ PM10
AJ Wind Gust
AJ Wind Speed

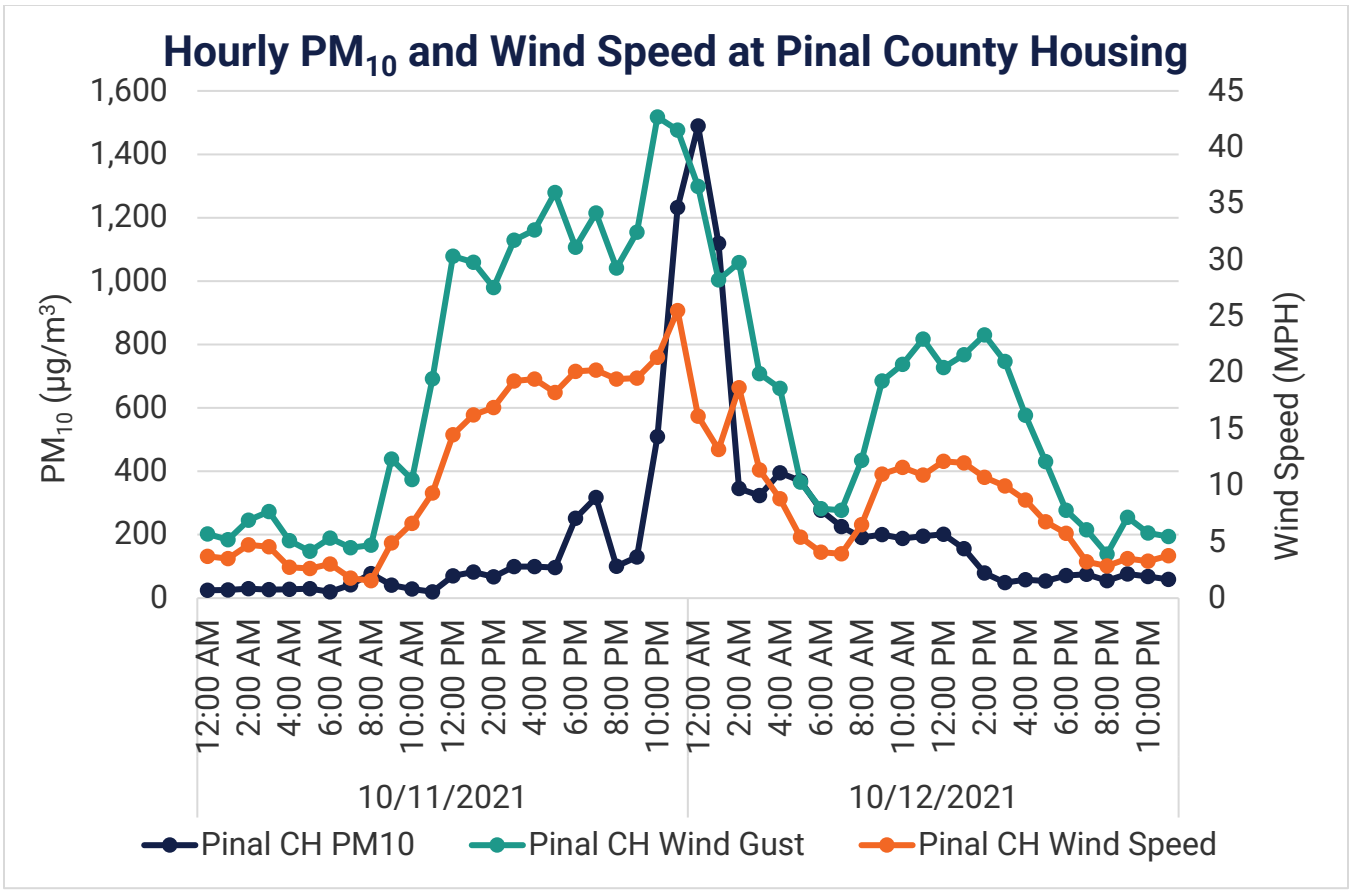

Hourly PM10 at Casa Grande Downtown
PM10 (µg/m3)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Casa Grande Downtown PM10

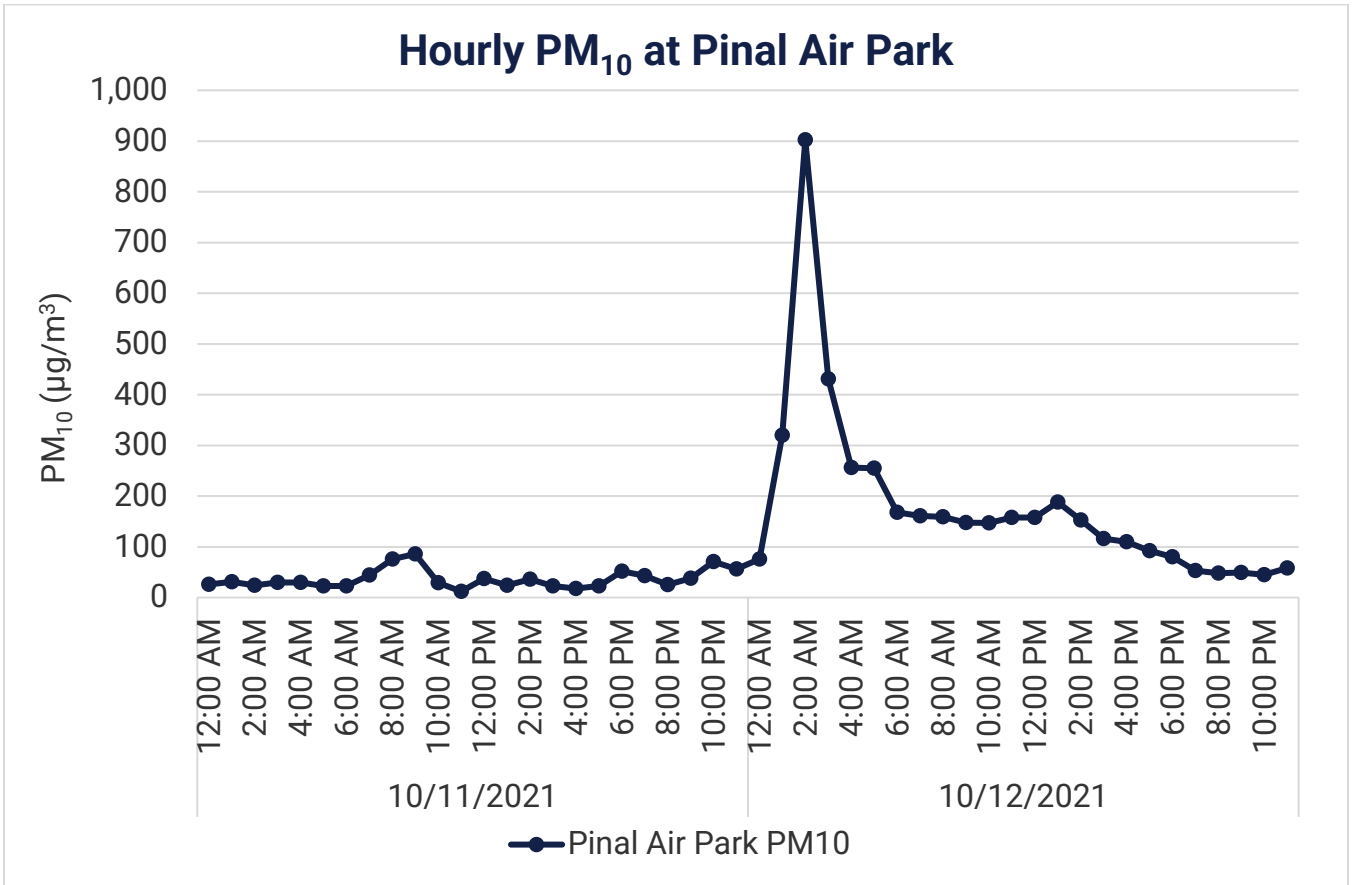

Hourly PM10 at Combs
1,400
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Combs PM10

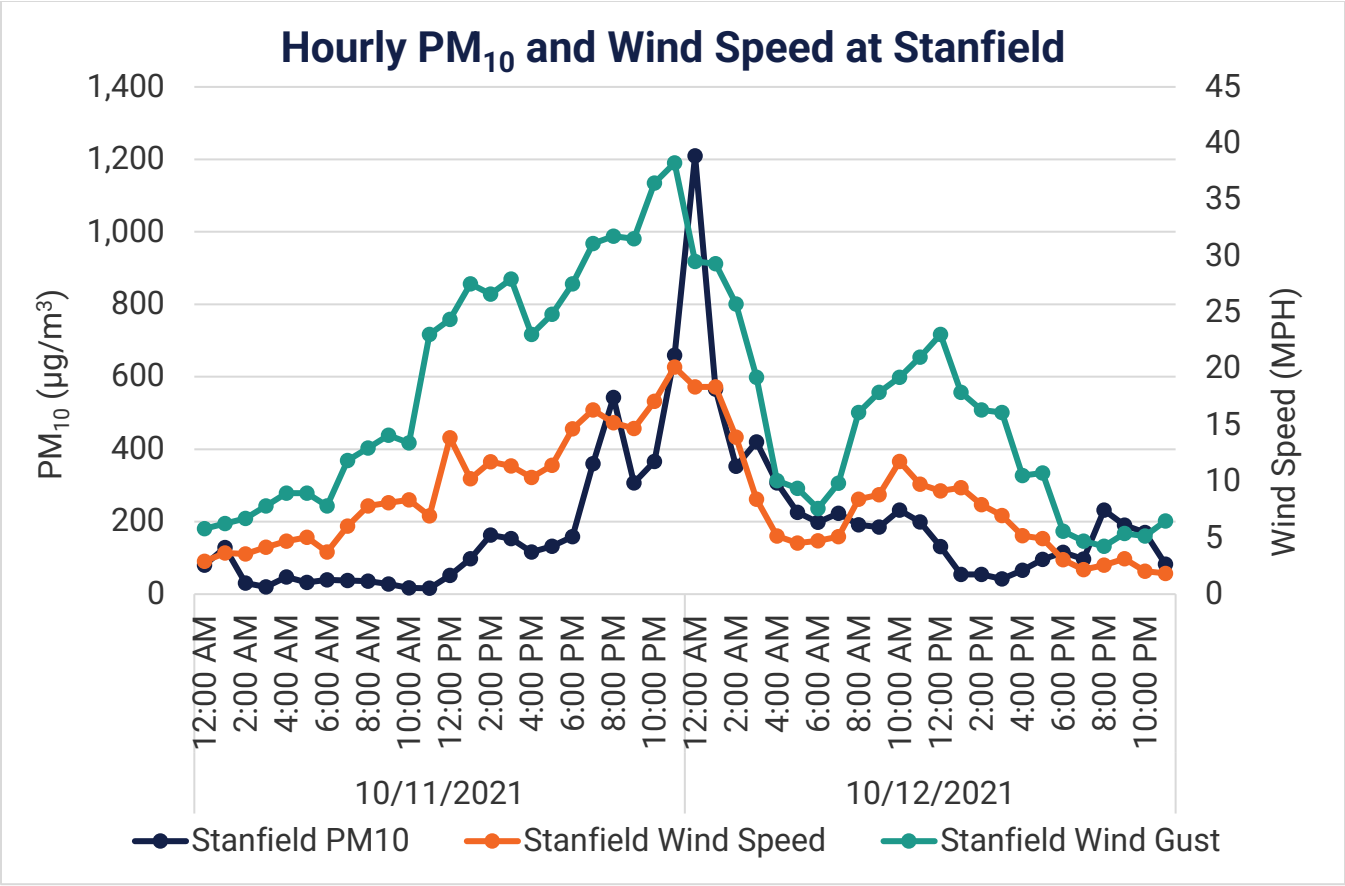

Hourly PM10 at Eloy
1,200
1,000
800
600
400
200
0
PM10 (µg/m3)
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Eloy PM10


Hourly PM10 and Wind Speed at Hidden Valley
PM10 (µg/m3)
Wind Speed (MPH)
1,400
1,200
1,000
800
600
400
200
0
60
50
40
30
20
10
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Hidden Valley PM10
Hidden Valley Wind Gust
Hidden Valley Wind Speed


Hourly PM10 at Maricopa 1405
PM10 (µg/m3)
3,000
2,500
2,000
1,500
1,000
500
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Maricopa 1405 PM10


Hourly PM10 and Wind Speed at Pinal County Housing
PM10 (µg/m3)
Wind Speed (MPH)
1,600
1,400
1,200
1,000
800
600
400
200
0
45
40
35
30
25
20
15
10
5
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Pinal CH PM10
Pinal CH Wind Gust
Pinal CH Wind Speed

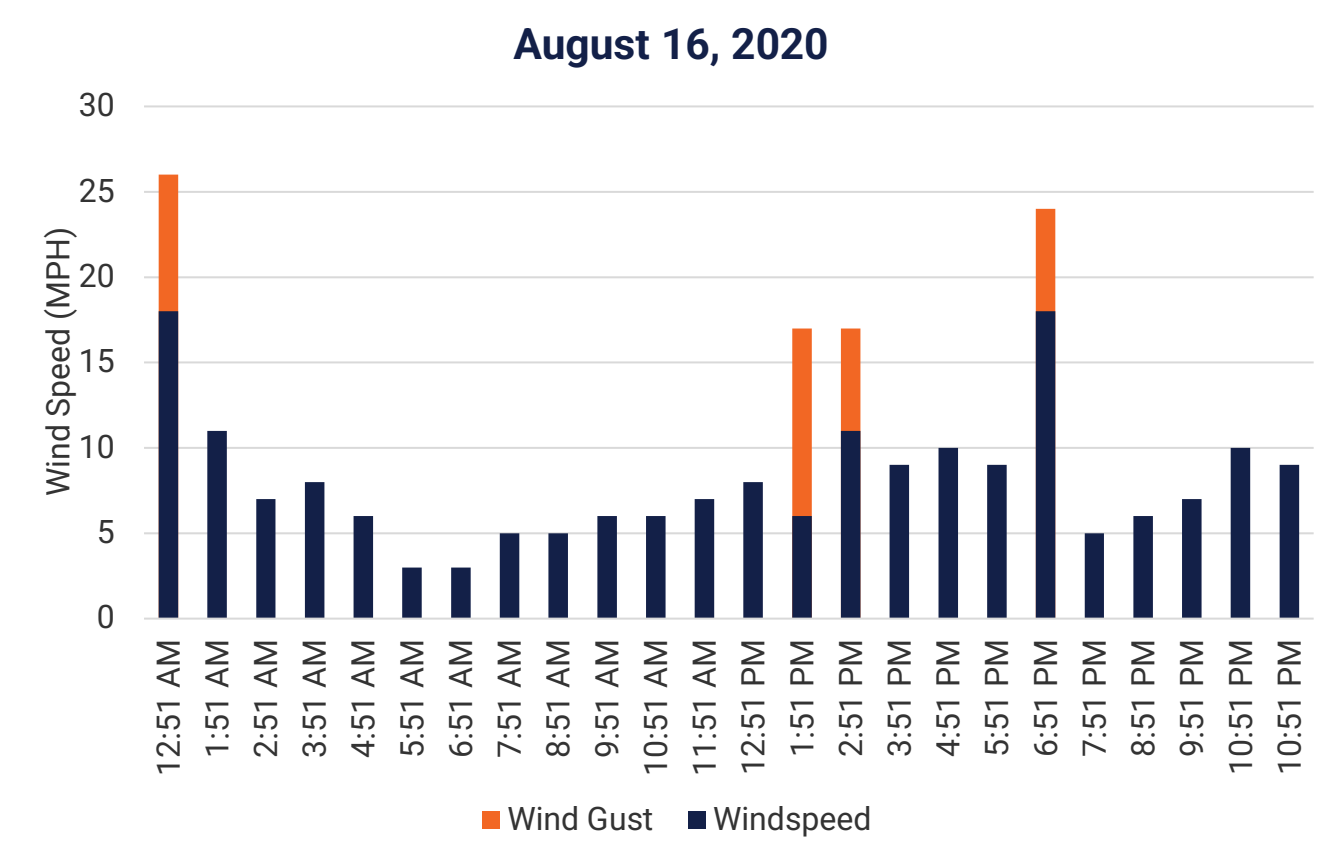

Hourly PM10 at Pinal Air Park
PM10 (µg/m3)
1,000
900
800
700
600
500
400
300
200
100
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Pinal Air Park PM10

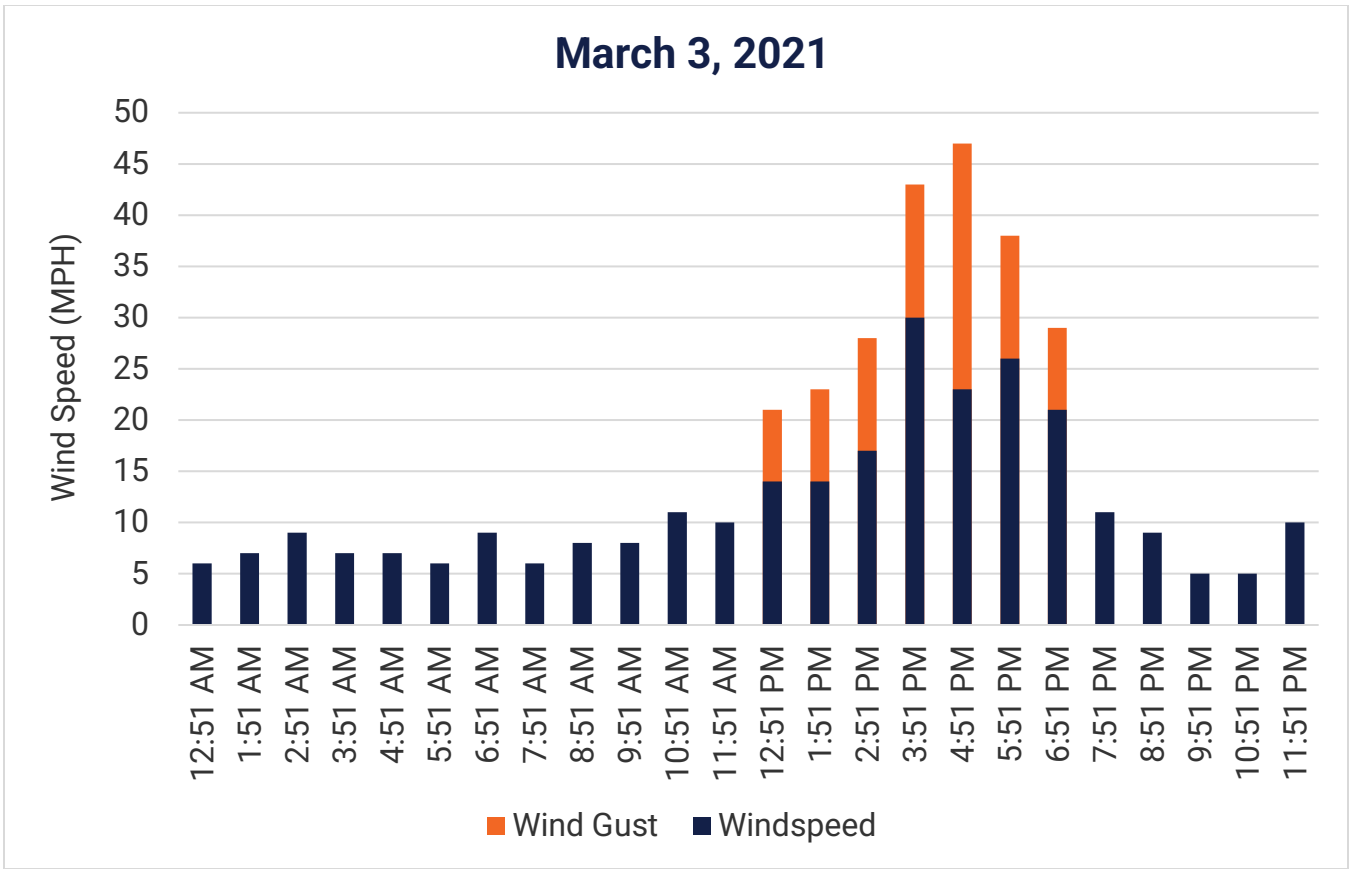

Hourly PM10 and Wind Speed at Stanfield
PM10 (µg/m3)
Wind Speed (MPH)
1,400
1,200
1,000
800
600
400
200
0
45
40
35
30
25
20
15
10
5
0
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
12:00 AM
2:00 AM
4:00 AM
6:00 AM
8:00 AM
10:00 AM
12:00 PM
2:00 PM
4:00 PM
6:00 PM
8:00 PM
10:00 PM
10/11/2021
10/12/2021
Stanfield PM10
Stanfield Wind Speed
Stanfield Wind Gust

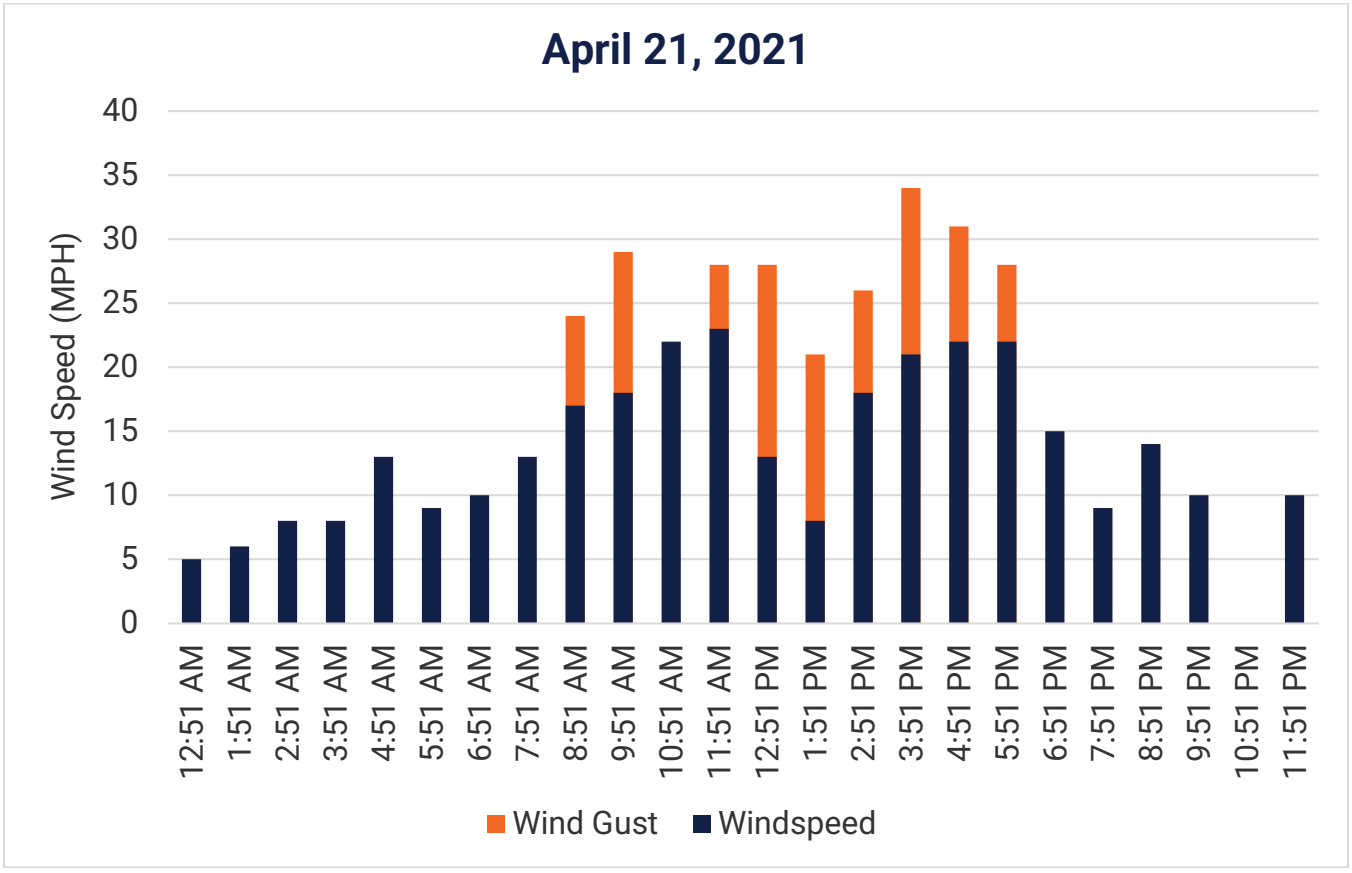
Appendix II

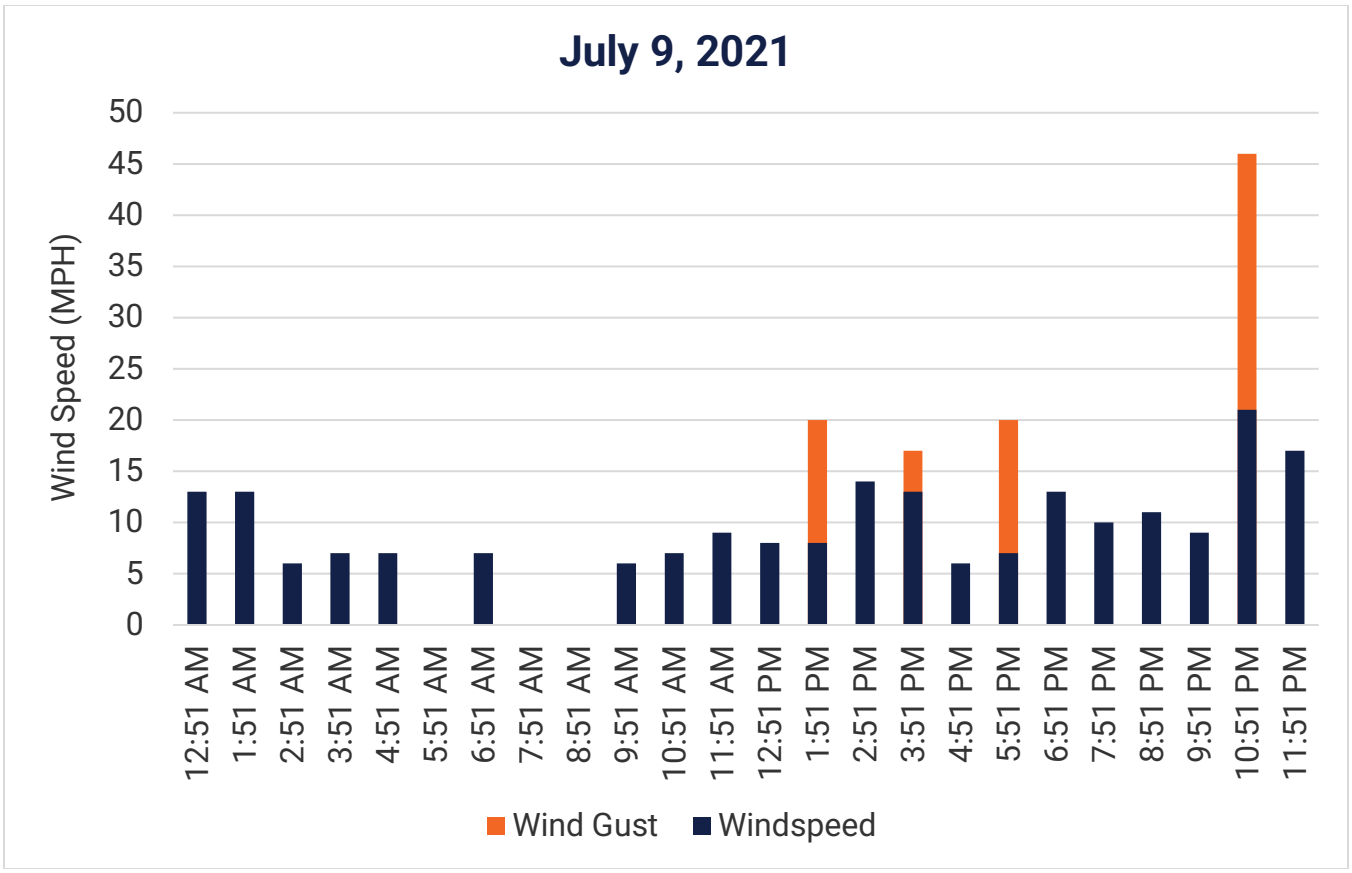
Charts of hourly windspeed and wind gust data from the Phoenix Sky Harbor Airport (KPHX), NOAA station ID WBAN:23183. Charts are presented for each of the atypical event dates listed in this report. Data were obtained from NOAA National Centers for Environmental Information site and were specified with the FM-15 report code (i.e., hourly METAR aviation routine weather report).

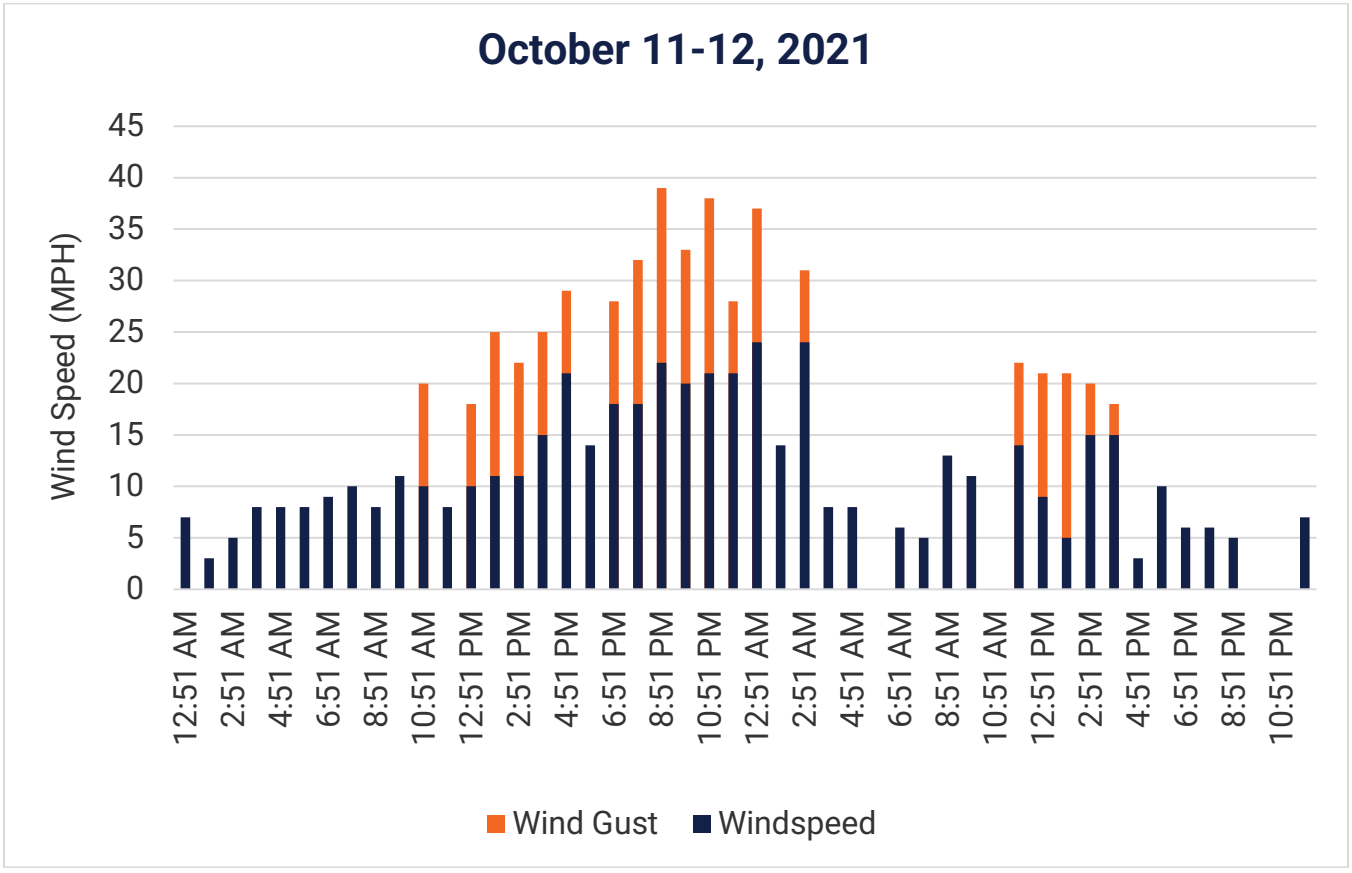
Note that wind gusts on these charts are defined by the National Weather Service as "a sudden, brief increase in speed of the wind. According to U.S. weather observing practice, gusts are reported when the peak wind speed reaches at least 16 knots and the variation in wind speed between the peaks and lulls is at least 9 knots. The duration of a gust is usually less than 20 seconds."




March 3, 2021
Wind Speed (MPH)
50
45
40
35
30
25
20
15
10
5
0
12:51 AM
1:51 AM
2:51 AM
3:51 AM
4:51 AM
5:51 AM
6:51 AM
7:51 AM
8:51 AM
9:51 AM
10:51 AM
11:51 AM
12:51 PM
1:51 PM
2:51 PM
3:51 PM
4:51 PM
5:51 PM
6:51 PM
7:51 PM
8:51 PM
9:51 PM
10:51 PM
11:51 PM
Wind Gust
Windspeed


April 21, 2021
Wind Speed (MPH)
40
35
30
25
20
15
10
5
0
12:51 AM
1:51 AM
2:51 AM
3:51 AM
4:51 AM
5:51 AM
6:51 AM
7:51 AM
8:51 AM
9:51 AM
10:51 AM
11:51 AM
12:51 PM
1:51 PM
2:51 PM
3:51 PM
4:51 PM
5:51 PM
6:51 PM
7:51 PM
8:51 PM
9:51 PM
10:51 PM
11:51 PM
Wind Gust
Windspeed


July 9, 2021
Wind Speed (MPH)
50
45
40
35
30
25
20
15
10
5
0
12:51 AM
1:51 AM
2:51 AM
3:51 AM
4:51 AM
5:51 AM
6:51 AM
7:51 AM
8:51 AM
9:51 AM
10:51 AM
11:51 AM
12:51 PM
1:51 PM
2:51 PM
3:51 PM
4:51 PM
5:51 PM
6:51 PM
7:51 PM
8:51 PM
9:51 PM
10:51 PM
11:51 PM
Wind Gust
Windspeed


October 11-12, 2021
Wind Speed (MPH)
45
40
35
30
25
20
15
10
5
0
12:51 AM
2:51 AM
4:51 AM
6:51 AM
8:51 AM
10:51 AM
12:51 PM
2:51 PM
4:51 PM
6:51 PM
8:51 PM
10:51 PM
12:51 AM
2:51 AM
4:51 AM
6:51 AM
8:51 AM
10:51 AM
12:51 PM
2:51 PM
4:51 PM
6:51 PM
8:51 PM
10:51 PM
Wind Gust
Windspeed

Maricopa County
Air Quality Department
Planning and Analysis Division
Maricopa.gov/AQ

Appendix B: NOAA Phoenix Sky Harbor Airport Station (WBAN:23183) Weather Data for March 3rd, July 9th, and October 11th, 2021

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Local Climatological Data
Daily Summary
March 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W
Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH / Direction = Degrees			
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type	TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01	71	39*	55	-7.0	14	6	39	10	0	0657	1825		0.00			29.00	30.18	4.4	18	080	13	110
02	79	48	64	1.9	17	17	45	1	0	0655	1826		0.00			28.75	29.92	7.6	27	090	18	120
03	86	49	68	5.7	23	24	47	0	3	0654	1826		0.00			28.69	29.83	11.6	47	200	37	200
04	71	52	62	-0.5	43	39	50	3	0	0653	1827		0.00			28.97	30.11	4.3	19	300	14	230
05	83	50	67	4.3	31	32	50	0	2	0652	1828		0.00			28.88	30.03	3.9	17	330	10	220
06	85	58	72	9.1	19	27	51	0	7	0650	1829		0.00			28.71	29.86	5.9	25	150	18	140
07	89	58	74	10.9	20	28	51	0	9	0649	1830		0.00			28.76	29.90	5.4	22	340	13	300
08	87	66	77	13.7	17	26	52	0	12	0648	1830		0.00			28.80	29.94	7.3	25	250	18	270
09	80	59	70	6.5	21	27	49	0	5	0647	1831		0.00			28.77	29.91	9.9	35	260	28	270
10	70	49	60	-3.7	26	24	44	5	0	0645	1832		0.00			28.79	29.94	7.5	28	210	20	220
11	69	48	59	-4.9	38	30	45	6	0	0644	1833	RA	0.01			28.79	29.96	7.6	32	270	24	270
12	59	46	53	-11.1	66	40	46	12	0	0643	1834	RA BR	0.17			28.87	30.03	6.4	24	340	18	320
13	61	45	53	-11.4	61	38	45	12	0	0641	1834	RA BR	0.19			28.92	30.10	7.1	31	360	25	360
14	68	42	55	-9.6	52	36	46	10	0	0640	1835		0.00			28.88	30.06	7.1	25	290	22	290
15	74	50	62	-2.8	36	32	47	3	0	0639	1836		0.00			28.66	29.83	8.2	40	250	29	260
16	61	47	54	-11.0	34	26	42	11	0	0637	1837		T			28.77	29.90	10.1	34	270	28	270
17	73	45	59	-6.2	33	29	45	6	0	0636	1837		0.00			28.87	30.05	4.1	17	340	13	080
18	83	51	67	1.6	30	31	50	0	2	0635	1838		0.00			28.84	30.00	3.7	13	330	9	270
19	85	53	69	3.4	22	26	50	0	4	0633	1839		0.00			28.84	29.99	4.2	16	300	10	300
20	86	56	71	5.2	23	31	52	0	6	0632	1840		0.00			28.78	29.93	9.2	28	230	22	230
21	78	58	68	2.0	17	20	48	0	3	0631	1840		0.00			28.68	29.83	8.7	26	260	20	280
22	72	55	64	-2.2	14	13	43	1	0	0629	1841		0.00			28.71	29.85	10.6	32	350	23	330
23	66	52	59	-7.4	31	26	44	6	0	0628	1842		T			28.54	29.69	9.4	30	290	25	290
24	72	48	60	-6.6	37	31	47	5	0	0627	1843		0.00			28.60	29.75	5.6	25	330	17	310
25	72	50	61	-5.8	25	24	45	4	0	0625	1843		0.00			28.59	29.74	12.0	33	220	24	210
26	66	53	60	-7.1	40	34	47	5	0	0624	1844	RA	T			28.71	29.86	7.4	23	270	18	290
27	79	48	64	-3.3	35	33	49	1	0	0623	1845		0.00			28.93	30.08	4.4	20	350	13	290
28	86	53	70	2.5	19	24	50	0	5	0621	1845		0.00			28.93	30.10	3.0	17	060	14	060
29	89*	59	74	6.3	16	23	51	0	9	0620	1846		0.00			28.63	29.78	5.8	18	290	12	260
30	86	56	71	3.1	14	19	49	0	6	0619	1847		0.00			28.69	29.80	7.7	31	270	17	280
31	88	59	74	5.8	8	9	48	0	9	0617	1848		0.00			28.87	30.01	7.2	25	040	17	030
	76.6	51.7	64.1							Monthly Averages | Totals			0.37			28.78	29.93	6.9				
	-0.3	-1.8	-1.1	Departure from Normal (1981-2010)									-0.62									

Degree Days

	Monthly		Season-to-date	
	Total	Departure	Total	Departure
Heating	105	24	887	
Cooling	78	-9	95	

Number of days with...

	Temperature				Precipitation		Snow	Weather	
	Max		Min						
	>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
Heating	0	0	0	0	3	2			
Cooling									

Date of 5-sec to 3-sec wind equipment change	Sea Level Pressure			Greatest...		
		Date	Time	24-Hr...		Snow Depth
2007-04-03	Maximum 30.30	01	1011	Precip	Snowfall	
	Minimum 29.62	25	1810	0.35		
				Date		
				12-13		

Station Augmentation

Name:CONTRACTOR Lat: 33.4442 Lon: -112.0247 Elevation: N/A Distance: 0.5mi N Elements: TEMP, PRECIP Equipment: MXMN, SRG

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W
Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Local Climatological Data
Hourly Observations
March 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Date	Time (LST)	Station Type	Sky Conditions	Visibility	Weather Type (see documentation)	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Hum %	Wind Speed (MPH)	Wind Dir (Deg)	Wind Gusts (MPH)	Station Press (inHg)	Press. Tend	Net 3-Hr Change (inHg)	Sea Level Press. (inHg)	Report Type	Precip Total (in)	Altimeter Setting (inHg)
					AU | AW | MW	(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
03	0051	7	CLR:00	10.00		57	13.9	42	5.6	19	-7.2	23	6	140		28.68			29.82	FM-15	0.00	29.85
03	0151	7	CLR:00	10.00		59	15.0	42	5.6	18	-7.8	20	7	100		28.69	5	0.00	29.83	FM-15	0.00	29.86
03	0251	7	CLR:00	10.00		56	13.3	41	5.0	18	-7.8	22	9	100		28.69			29.83	FM-15	0.00	29.86
03	0351	7	CLR:00	10.00		54	12.2	40	4.4	19	-7.2	25	7	100		28.69			29.83	FM-15	0.00	29.86
03	0451	7	CLR:00	10.00		53	11.7	40	4.4	20	-6.7	27	7	110		28.69	3	-0.01	29.84	FM-15	0.00	29.87
03	0500	4		9.94		53	11.7	40	4.4	20	-6.7	27	7	110		28.70	3	-0.01	29.84	FM-12		
03	0551	7	CLR:00	10.00		50	10.0	38	3.3	20	-6.7	30	6	100		28.69			29.84	FM-15	0.00	29.87
03	0651	7	FEW:02 150 FEW:02 250	10.00		53	11.7	39	3.9	18	-7.8	25	9	120		28.69			29.84	FM-15	0.00	29.87
03	0751	7	FEW:02 150	10.00		55	12.8	41	5.0	19	-7.2	24	6	100		28.70	3	-0.01	29.85	FM-15	0.00	29.88
03	0851	7	FEW:02 150	10.00		60	15.6	43	6.1	19	-7.2	20	8	120		28.71			29.87	FM-15	0.00	29.89
03	0951	7	FEW:02 150	10.00		66	18.9	46	7.8	17	-8.3	15	8	100		28.71			29.86	FM-15	0.00	29.89
03	1051	7	FEW:02 150	10.00		72	22.2	49	9.4	18	-7.8	13	11	110		28.69	8	+0.02	29.83	FM-15	0.00	29.87
03	1100	4		9.94		72	22.2	49	9.4	18	-7.8	13	11	110		28.70	8	+0.02	29.83	FM-12		
03	1151	7	FEW:02 150	10.00		77	25.0	51	10.6	17	-8.3	10	10	160		28.66			29.80	FM-15	0.00	29.84
03	1251	7	FEW:02 120	10.00		81	27.2	51	10.6	9	-12.8	6	14	170	21	28.62			29.76	FM-15	0.00	29.79
03	1351	7	FEW:02 120	10.00		84	28.9	53	11.7	11	-11.7	6	14	180	23	28.58	8	+0.12	29.70	FM-15	0.00	29.75
03	1451	7	FEW:02 120	10.00		85	29.4	54	12.2	18	-7.8	8	17	200	28	28.54			29.67	FM-15	0.00	29.71
03	1551	7	FEW:02 120	10.00		83	28.3	55	12.8	24	-4.4	11	30	190	43	28.56			29.69	FM-15	0.00	29.73
03	1651	7	FEW:02 120	10.00		79	26.1	53	11.7	23	-5.0	12	23	210	47	28.58	3	-0.01	29.72	FM-15	0.00	29.75
03	1700	4		9.94		79	26.1	53	11.7	23	-5.0	12	23	210		28.58	3	-0.01	29.72	FM-12		
03	1751	7	FEW:02 120	10.00		72	22.2	51	10.6	26	-3.3	18	26	240	38	28.63			29.77	FM-15	0.00	29.80
03	1851	7	FEW:02 120	10.00		67	19.4	52	11.1	36	2.2	32	21	240	29	28.69			29.83	FM-15	0.00	29.86
03	1951	7	FEW:02 120 FEW:02 230	10.00		65	18.3	52	11.1	39	3.9	39	11	250		28.73	3	-0.15	29.88	FM-15	0.00	29.91
03	2051	7	FEW:02 120 FEW:02 230	10.00		64	17.8	51	10.6	38	3.3	38	9	250		28.75			29.90	FM-15	0.00	29.93
03	2151	7	BKN:07 80	10.00		64	17.8	51	10.6	37	2.8	37	5	120		28.78			29.93	FM-15	0.00	29.96
03	2251	7	BKN:07 85	10.00		62	16.7	51	10.6	40	4.4	44	5	250		28.80	3	-0.07	29.95	FM-15	0.00	29.98
03	2300	4		9.94		62	16.7	51	10.6	40	4.4	44	5	250		28.80	3	-0.07	29.95	FM-12		
03	2351	7	BKN:07 80	10.00		61	16.1	51	10.6	41	5.0	48	10	240		28.83			29.97	FM-15	0.00	30.01

Max Hourly &
24-Hour Wind Speed

Max Hourly &
24-Hour Wind Gust
Speed

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Local Climatological Data
Hourly Remarks
March 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W

Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Date	Time (LST)	Remarks
03	0051	MET09903/03/21 00:51:02 METAR KPHX 030751Z 14005KT 10SM CLR 14/M07 A2985 RMK AO2 SLP097 T01391072 $ (GEH)
03	0151	MET10503/03/21 01:51:02 METAR KPHX 030851Z 10006KT 10SM CLR 15/M08 A2986 RMK AO2 SLP101 T01501078 55000 $ (GEH)
03	0251	MET09903/03/21 02:51:02 METAR KPHX 030951Z 10008KT 10SM CLR 13/M08 A2986 RMK AO2 SLP101 T01331078 $ (GEH)
03	0351	MET09903/03/21 03:51:02 METAR KPHX 031051Z 10006KT 10SM CLR 12/M07 A2986 RMK AO2 SLP102 T01221072 $ (GEH)
03	0451	MET11703/03/21 04:51:02 METAR KPHX 031151Z 11006KT 10SM CLR 12/M07 A2987 RMK AO2 SLP104 T01171067 10161 20111 53002 $ (GEH)
03	0500	SYN08072278 32966 01106 10117 21067 39718 40104 53002 91151 333 10261 20111 555 90312=
03	0551	MET09903/03/21 05:51:02 METAR KPHX 031251Z 10005KT 10SM CLR 10/M07 A2987 RMK AO2 SLP104 T01001067 $ (GEH)
03	0651	MET10803/03/21 06:51:02 METAR KPHX 031351Z 12008KT 10SM FEW150 FEW250 12/M08 A2987 RMK AO2 SLP106 T01171078 $ (DZ)
03	0751	MET10703/03/21 07:51:02 METAR KPHX 031451Z 10005KT 10SM FEW150 13/M07 A2988 RMK AO2 SLP109 T01281072 53005 $ (DZ)
03	0851	MET10103/03/21 08:51:02 METAR KPHX 031551Z 12007KT 10SM FEW150 16/M07 A2989 RMK AO2 SLP114 T01561072 $ (DZ)
03	0951	MET10103/03/21 09:51:02 METAR KPHX 031651Z 10007KT 10SM FEW150 19/M08 A2989 RMK AO2 SLP112 T01891083 $ (DZ)
03	1051	MET11903/03/21 10:51:02 METAR KPHX 031751Z 11010KT 10SM FEW150 22/M08 A2987 RMK AO2 SLP102 T02221078 10222 20094 58006 $ (DZ)
03	1100	SYN08072278 32966 21110 10222 21078 39718 40102 58006 91751 333 10222 20094 555 90318=
03	1151	MET10103/03/21 11:51:02 METAR KPHX 031851Z 16009KT 10SM FEW150 25/M08 A2984 RMK AO2 SLP092 T02501083 $ (DZ)
03	1251	MET10403/03/21 12:51:02 METAR KPHX 031951Z 17012G18KT 10SM FEW120 27/M13 A2979 RMK AO2 SLP077 T02721128 $ (DZ)
03	1351	MET11003/03/21 13:51:02 METAR KPHX 032051Z 18012G20KT 10SM FEW120 29/M12 A2975 RMK AO2 SLP059 T02891117 58040 $ (DZ)
03	1451	MET12203/03/21 14:51:02 METAR KPHX 032151Z 20015G24KT 10SM FEW120 29/M08 A2971 RMK AO2 PK WND 16033/2124 SLP047 T02941078 $ (SH)
03	1551	MET13303/03/21 15:51:02 METAR KPHX 032251Z 19026G37KT 10SM FEW120 28/M04 A2973 RMK AO2 PK WND 21038/2229 SLP054 BLDU ALQDS T02831044 $ (SH)
03	1651	MET15103/03/21 16:51:02 METAR KPHX 032351Z 21020G41KT 10SM FEW120 26/M05 A2975 RMK AO2 PK WND 20041/2333 SLP064 BLDU ALQDS T02611050 10300 20222 53003 $ (SH)
03	1700	SYN08672278 32966 22120 10261 21050 39679 40064 53003 92351 333 10300 20111 91041 555 90400=
03	1751	MET12803/03/21 17:51:01 METAR KPHX 040051Z 24023G33KT 10SM FEW120 22/M03 A2980 RMK AO2 PK WND 21034/0001 SLP081 BLDU ALQDS T02221033 $
03	1851	MET12703/03/21 18:51:01 METAR KPHX 040151Z 24018G25KT 10SM FEW120 19/02 A2986 RMK AO2 PK WND 24036/0108 SLP102 BLDU ALQDS T01940022 $
03	1951	MET12603/03/21 19:51:01 METAR KPHX 040251Z 25010KT 10SM FEW120 FEW230 18/04 A2991 RMK AO2 PK WND 24027/0154 SLP120 T01830039 53051 $
03	2051	MET10203/03/21 20:51:01 METAR KPHX 040351Z 25008KT 10SM FEW120 FEW230 18/03 A2993 RMK AO2 SLP125 T01780033 $
03	2151	MET09503/03/21 21:51:02 METAR KPHX 040451Z 12004KT 10SM BKN080 18/03 A2996 RMK AO2 SLP137 T01780028 $
03	2251	MET11303/03/21 22:51:02 METAR KPHX 040551Z 25004KT 10SM BKN085 17/04 A2998 RMK AO2 SLP143 T01670044 10261 20167 53025 $
03	2300	SYN08072278 32966 62504 10167 20044 39754 40143 53025 90551 333 10261 20111 555 90406=
03	2351	MET10503/03/21 23:51:02 METAR KPHX 040651Z 24009KT 10SM BKN080 16/05 A3001 RMK AO2 SLP149 T01610050 403000094 $

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Local Climatological Data
Hourly Precipitation
March 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W

Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Date	For Hour (LST) Ending at																							Date
	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	NOON	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	MID	
01																									01
02																									02
03																									03
04																									04
05																									05
06																									06
07																									07
08																									08
09																									09
10																									10
11																					0.01	T			11
12	T		T	0.04	0.06	0.01								T	T	T						T	0.01	0.05	12
13	0.02	0.12	0.04	0.01																	T				13
14																									14
15																									15
16				T	T																				16
17																									17
18																									18
19																									19
20																									20
21																									21
22																									22
23															T	T									23
24																									24
25																									25
26														T	T										26
27																									27
28																									28
29																									29
30																									30
31																									31

Maximum Short Duration Precipitation

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (inches)	0.02	0.03	0.05	0.06	0.08	0.11	0.13	0.14	0.15	0.17	0.18	0.19
Ending Date Time (yyyy-mm-dd hh:mi)	2021-03-13 01:39	2021-03-13 01:39	2021-03-13 01:18	2021-03-13 01:27	2021-03-13 01:39	2021-03-13 01:47	2021-03-13 01:53	2021-03-13 01:53	2021-03-13 02:39	2021-03-13 02:52	2021-03-13 02:52	2021-03-13 03:36

Hourly, daily, and monthly totals on the Daily Summary page and the Hourly Precipitation Table are shown as reported by the instrumentation at the site. However, NWS does not edit hourly values for its ASOS sites, but may edit the daily and monthly totals for selected sites which will be reflected on the Daily Summary page.

T = Trace
s = Suspect
* = Erroneous
blank = No precipitation observed
M = Missing

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Local Climatological Data
Daily Summary
July 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W
Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH / Direction = Degrees			
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type	TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01	107	85	96	1.9	29	57	71	0	31	0522	1942	TS RA	T			28.64	29.75	6.0	37	050	31	060
02	105	89	97	2.8	32	61	72	0	32	0522	1942	TS	T			28.64	29.75	6.0	29	150	23	160
03	107	79	93	-1.4	42	63	73	0	28	0523	1942	TS RA	0.26			28.67	29.79	7.2	42	050	35	050
04	103	80	92	-2.5	46	66	74	0	27	0523	1941		0.00			28.66	29.79	5.3	19	280	16	080
05	107	90	99	4.4	29	59	72	0	34	0524	1941		0.00			28.64	29.75	7.2	23	280	17	280
06	111	89	100	5.3	17	46	67	0	35	0524	1941		0.00			28.59	29.70	7.6	24	270	20	270
07	111	88	100	5.2	19	50	69	0	35	0525	1941		0.00			28.56	29.67	5.5	24	280	17	300
08	112	92	102	7.2	27	60	74	0	37	0525	1941		0.00			28.58	29.69	6.9	29	260	23	260
09	112	93	103	8.1	27	62	74	0	38	0526	1941	DU	0.00			28.63	29.72	8.8	46	150	32	140
10	112*	85	99	4.0	30	62	74	0	34	0526	1940	TS RA	T			28.61	29.72	11.9	49	040	38	030
11	111	85	98	3.0	33	62	74	0	33	0527	1940		0.00			28.59	29.71	8.1	24	260	21	270
12	106	90	98	3.0	28	59	72	0	33	0527	1940		0.00			28.64	29.74	7.1	30	140	23	140
13	109	86	98	2.9	31	61	73	0	33	0528	1939	HZ	0.00			28.66	29.78	8.5	30	140	22	140
14	99	77	88	-7.1	49	65	73	0	23	0529	1939	TS RA	0.10			28.74	29.85	8.6	43	290	36	290
15	102	85	94	-1.1	43	66	74	0	29	0529	1938		0.00			28.69	29.81	8.0	25	340	17	330
16	102	83	93	-2.1	46	66	74	0	28	0530	1938	RA	0.01			28.68	29.79	9.2	34	140	28	130
17	102	83	93	-2.1	39	63	72	0	28	0530	1938		0.00			28.70	29.82	5.8	18	340	13	290
18	102	88	95	-0.1	36	64	74	0	30	0531	1937		0.00			28.76	29.87	7.4	31	170	25	170
19	105	88	97	2.0	36	64	74	0	32	0532	1937		0.00			28.74	29.86	7.5	19	230	16	260
20	109	89	99	4.0	34	64	75	0	34	0532	1936		0.00			28.66	29.79	8.1	29	280	23	270
21	109	89	99	4.0	33	64	75	0	34	0533	1936	TS	0.00			28.62	29.73	8.3	32	280	25	310
22	106	78	92	-2.9	46	67	75	0	27	0534	1935	TS RA	0.21			28.72	29.83	9.8	33	150	25	050
23	83	73	78	-16.9	85	71	73	0	13	0534	1934	TS RA BR	0.80			28.87	29.99	8.7	31	130	23	150
24	83	74	79	-15.8	81	71	73	0	14	0535	1934	RA BR	0.18			28.79	29.94	8.7	18	100	15	110
25	81	73*	77	-17.8	80	71	73	0	12	0536	1933	RA	0.11			28.77	29.91	7.1	17	060	14	320
26	98	75	87	-7.7	53	66	73	0	22	0536	1932		0.00			28.74	29.87	4.8	16	200	10	160
27	104	81	93	-1.7	40	63	72	0	28	0537	1932	RA	0.00			28.74	29.85	6.6	43	140	26	170
28	105	83	94	-0.6	34	61	72	0	29	0538	1931		0.00			28.71	29.84	4.4	19	130	15	120
29	106	88	97	2.4	33	60	72	0	32	0538	1930		0.00			28.66	29.77	9.0	33	050	26	050
30	104	80	92	-2.5	36	61	72	0	27	0539	1929	TS RA	0.01			28.72	29.83	9.5	35	170	28	290
31	100	77	89	-5.5	50	66	73	0	24	0540	1929	TS RA	0.05			28.77	29.90	5.5	23	170	20	180
	103.6	83.7	93.7							Monthly Averages | Totals			1.73			28.68	29.80	7.6				
	-2.5	0.2	-1.1	Departure from Normal (1981-2010)									0.68									

Degree Days

	Monthly		Season-to-date	
	Total	Departure	Total	Departure
Heating	0	0	0	
Cooling	889	-35	2806	

Number of days with...

	Temperature				Precipitation		Snow	Weather	
	Max		Min						
	>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
Heating									
Cooling	28	0	0	0	9	6		12	

Date of 5-sec to 3-sec wind equipment change: 2007-04-03

Sea Level Pressure

		Date	Time
Maximum	30.06	23	1125
Minimum	29.56	07	1851

Greatest...

24-Hr...		Snow Depth
Precip	Snowfall	
1.01		
Date		
22-23		

Station Augmentation

Name:CONTRACTOR Lat: 33.4442 Lon: -112.0247 Elevation: N/A Distance: 0.5mi N Elements: TEMP, PRECIP Equipment: MXMN, SRG

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W
Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Local Climatological Data
Hourly Observations
July 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Date	Time (LST)	Station Type	Sky Conditions	Visibility	Weather Type (see documentation)	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Hum %	Wind Speed (MPH)	Wind Dir (Deg)	Wind Gusts (MPH)	Station Press (inHg)	Press. Tend	Net 3-Hr Change (inHg)	Sea Level Press. (inHg)	Report Type	Precip Total (in)	Altimeter Setting (inHg)
					AU | AW | MW	(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
09	0051	7	FEW:02 160	10.00		98	36.7	74	23.3	63	17.2	32	13	260		28.58			29.68	FM-15	0.00	29.75
09	0151	7	FEW:02 250	10.00		98	36.7	74	23.3	63	17.2	32	13	270		28.59	1	-0.03	29.69	FM-15	0.00	29.76
09	0251	7	FEW:02 250	10.00		97	36.1	74	23.3	63	17.2	33	6	290		28.61			29.71	FM-15	0.00	29.78
09	0351	7	FEW:02 250	10.00		96	35.6	74	23.3	63	17.2	34	7	320		28.62			29.71	FM-15	0.00	29.79
09	0451	7	FEW:02 250	10.00		95	35.0	73	22.8	63	17.2	35	7	300		28.63	1	-0.03	29.72	FM-15	0.00	29.80
09	0500	4		9.94		95	35.0	73	22.8	63	17.2	35	7	300		28.63	1	-0.03	29.72	FM-12		
09	0551	7	FEW:02 160 FEW:02 250	10.00		94	34.4	73	22.8	63	17.2	36	0	000		28.66			29.76	FM-15	0.00	29.83
09	0651	7	FEW:02 160	10.00		95	35.0	74	23.3	64	17.8	36	7	330		28.66			29.77	FM-15	0.00	29.84
09	0751	7	FEW:02 160	10.00		96	35.6	74	23.3	64	17.8	35	0	000		28.69	1	-0.06	29.79	FM-15	0.00	29.86
09	0851	7	FEW:02 160	10.00		98	36.7	75	23.9	64	17.8	33	0	000		28.69			29.79	FM-15	0.00	29.86
09	0951	7	FEW:02 160	10.00		100	37.8	75	23.9	63	17.2	30	6	VRB		28.69			29.78	FM-15	0.00	29.86
09	1051	7	FEW:02 85 FEW:02 160	10.00		103	39.4	76	24.4	64	17.8	28	7	190		28.68	8	+0.01	29.78	FM-15	0.00	29.85
09	1100	4		9.94		103	39.4	76	24.4	64	17.8	28	7	190		28.68	8	+0.01	29.78	FM-12		
09	1151	7	FEW:02 95 FEW:02 160	10.00		105	40.6	76	24.4	63	17.2	25	9	300		28.66			29.76	FM-15	0.00	29.83
09	1251	7	FEW:02 95 FEW:02 250	10.00		106	41.1	76	24.4	63	17.2	25	8	260		28.64			29.74	FM-15	0.00	29.81
09	1351	7	FEW:02 95 FEW:02 250	10.00		108	42.2	76	24.4	61	16.1	22	8	VRB	20	28.62	8	+0.06	29.71	FM-15	0.00	29.79
09	1451	7	FEW:02 95 FEW:02 250	10.00		109	42.8	75	23.9	60	15.6	20	14	280		28.60			29.70	FM-15	0.00	29.77
09	1551	7	FEW:02 95 FEW:02 250	10.00		111	43.9	76	24.4	61	16.1	20	13	VRB	17	28.56			29.66	FM-15	0.00	29.73
09	1651	7	FEW:02 95 FEW:02 170 FEW:02 250	10.00		111	43.9	75	23.9	59	15.0	18	6	230		28.55	6	+0.07	29.65	FM-15	0.00	29.72
09	1700	4		9.94		111	43.9	75	23.9	59	15.0	18	6	230		28.55	6	+0.07	29.65	FM-12		
09	1751	7	FEW:02 95 SCT:04 170 SCT:04 250	10.00		111	43.9	75	23.9	59	15.0	18	7	250	20	28.55			29.64	FM-15	0.00	29.72
09	1851	7	SCT:04 95 SCT:04 180 BKN:07 210	10.00		110	43.3	75	23.9	58	14.4	18	13	240		28.54			29.63	FM-15	0.00	29.71
09	1951	7	SCT:04 95 BKN:07 180 BKN:07 200	10.00		109	42.8	74	23.3	58	14.4	19	10	240		28.55	3	0.00	29.65	FM-15	0.00	29.72
09	2051	7	SCT:04 95 BKN:07 180 BKN:07 210	10.00		107	41.7	74	23.3	59	15.0	21	11	240		28.56			29.65	FM-15	0.00	29.73
09	2151	7	SCT:04 80 BKN:07 180 BKN:07 210	10.00		105	40.6	74	23.3	59	15.0	22	9	240		28.59			29.68	FM-15	0.00	29.76
09	2245	7	BKN:07 8	1.00	BL:5 DU:5 ||	100	37.8	74	23.3	61	16.1	27	30	120	46	28.69				FM-16		29.87
09	2249	6	VV:09 5	0.50	DS:5 ||DU s	97	36.1	73	22.8	61	16.1	30	29	140	46	28.69				FM-16		29.87

Max 24-Hour Wind Speed

Max 24-Hour Wind Gust Speed

09	2251	7	VV:09 5	0.25	DS:5 ||DU s	95	35.0	72	22.2	61	16.1	32	21	140	46	28.69	3	-0.14	29.80	FM-15	0.00	29.87
09	2258	7	VV:09 5	0.50	DS:5 ||DU s	94	34.4	71	21.7	59	15.0	31	20	130	36	28.69				FM-16		29.87
09	2300	4		0.25	||DU	95	35.0	72	22.2	61	16.1	32	21	140		28.70	3	-0.14	29.80	FM-12		
09	2308	7	OVC:08 8	1.00	BL:5 DU:5 ||	93	33.9	71	21.7	59	15.0	32	17	150	26	28.68				FM-16		29.85
09	2314	7	SCT:04 8 BKN:07 50	5.00	BL:5 DU:5 ||	93	33.9	72	22.2	61	16.1	34	22	150	31	28.66				FM-16		29.84
09	2351	7	SCT:04 60 BKN:07 120 OVC:08 180	10.00		96	35.6	73	22.8	61	16.1	31	17	190		28.66			29.75	FM-15	0.00	29.83

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
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Local Climatological Data
Hourly Remarks
July 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W

Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Date	Time (LST)	Remarks
09	0051	MET09907/09/21 00:51:02 METAR KPHX 090751Z 26011KT 10SM FEW160 37/17 A2975 RMK AO2 SLP052 T03670172 (ANH)
09	0151	MET10507/09/21 01:51:02 METAR KPHX 090851Z 27011KT 10SM FEW250 37/17 A2976 RMK AO2 SLP054 T03670172 51009 (ANH)
09	0251	MET09907/09/21 02:51:02 METAR KPHX 090951Z 29005KT 10SM FEW250 36/17 A2978 RMK AO2 SLP060 T03610172 (ANH)
09	0351	MET09907/09/21 03:51:02 METAR KPHX 091051Z 32006KT 10SM FEW250 36/17 A2979 RMK AO2 SLP062 T03560172 (ANH)
09	0451	MET11707/09/21 04:51:02 METAR KPHX 091151Z 30006KT 10SM FEW250 35/17 A2980 RMK AO2 SLP066 T03500172 10394 20350 51011 (ANH)
09	0500	SYN08072278 32966 23006 10350 20172 39695 40066 51011 91151 333 10444 20350 555 90912=
09	0551	MET10607/09/21 05:51:02 METAR KPHX 091251Z 00000KT 10SM FEW160 FEW250 34/17 A2983 RMK AO2 SLP077 T03440172 (ANH)
09	0651	MET09807/09/21 06:51:02 METAR KPHX 091351Z 33006KT 10SM FEW160 35/18 A2984 RMK AO2 SLP082 T03500178 (DZ)
09	0751	MET10407/09/21 07:51:02 METAR KPHX 091451Z 00000KT 10SM FEW160 36/18 A2986 RMK AO2 SLP089 T03560178 51021 (DZ)
09	0851	MET09807/09/21 08:51:02 METAR KPHX 091551Z 00000KT 10SM FEW160 37/18 A2986 RMK AO2 SLP088 T03670178 (DZ)
09	0951	MET09807/09/21 09:51:02 METAR KPHX 091651Z VRB05KT 10SM FEW160 38/17 A2986 RMK AO2 SLP086 T03780172 (DZ)
09	1051	MET12307/09/21 10:51:02 METAR KPHX 091751Z 19006KT 10SM FEW085 FEW160 39/18 A2985 RMK AO2 SLP084 T03940178 10400 20344 58004 (DZ)
09	1100	SYN08072278 32966 21906 10394 20178 39712 40084 58004 91751 333 10400 20344 555 90918=
09	1151	MET10507/09/21 11:51:02 METAR KPHX 091851Z 30008KT 10SM FEW095 FEW160 41/17 A2983 RMK AO2 SLP078 T04060172 (DZ)
09	1251	MET12207/09/21 12:51:02 METAR KPHX 091951Z 26007KT 10SM FEW095 FEW250 41/17 A2981 RMK AO2 SLP072 CB DSNT N AND NE T04110172 (DZ)
09	1351	MET13107/09/21 13:51:02 METAR KPHX 092051Z 29007G17KT 10SM FEW095 FEW250 42/16 A2979 RMK AO2 SLP062 CB DSNT N AND NE T04220161 58021 (DZ)
09	1451	MET11707/09/21 14:51:02 METAR KPHX 092151Z 28012KT 10SM FEW095 FEW250 43/16 A2977 RMK AO2 SLP056 CB DSNT N AND NE T04280156
09	1551	MET13507/09/21 15:51:02 METAR KPHX 092251Z 27011G15KT 10SM FEW095 FEW250 44/16 A2973 RMK AO2 SLP043 CB DSNT NE AND SE AND NW-N T04390161 (SH)
09	1651	MET16707/09/21 16:51:02 METAR KPHX 092351Z 23005KT 10SM FEW095 FEW170 FEW250 44/15 A2972 RMK AO2 SLP039 CB DSNT NE AND S AND NW-N TCU DSNT E T04390150 10444 20383 56023 (SH)
09	1700	SYN08072278 32966 22305 10439 20150 39669 40039 56023 92351 333 10444 20350 555 91000=
09	1751	MET14207/09/21 17:51:01 METAR KPHX 100051Z 25006G17KT 10SM FEW095 SCT170 SCT250 44/15 A2972 RMK AO2 SLP038 CB DSNT NE AND E AND S AND NW-N T04390150
09	1851	MET13407/09/21 18:51:01 METAR KPHX 100151Z 24011KT 10SM SCT095 SCT180 BKN210 43/14 A2971 RMK AO2 SLP035 CB DSNT NE-SE AND S AND NW T04330144
09	1951	MET12507/09/21 19:51:01 METAR KPHX 100251Z 24009KT 10SM SCT095 BKN180 BKN200 43/14 A2972 RMK AO2 SLP039 SHRA DSNT E T04280144 53000
09	2051	MET14307/09/21 20:51:02 METAR KPHX 100351Z 24010KT 10SM SCT095 BKN180 BKN210 42/15 A2973 RMK AO2 SLP041 CONS LTGCGIC DSNT NE-E CB DSNT NE-E T04170150
09	2151	MET15707/09/21 21:51:02 METAR KPHX 100451Z 24008KT 10SM SCT080 BKN180 BKN210 41/15 A2976 RMK AO2 LTG DSNT SE SLP052 CONS LTGCGIC DSNT NE-SE CB DSNT NE-SE T04060150
09	2245	MET15107/09/21 22:45:02 SPECI KPHX 100545Z 12026G40KT 1SM R07L/6000VP6000FT BLDU BKN008 38/16 A2987 RMK AO2 PK WND 15040/0545 LTG DSNT E-S PRESRR BLDU BKN008
09	2249	MET14107/09/21 22:49:03 SPECI KPHX 100549Z 14025G40KT 1/2SM R07L/2600VP6000FT DS VV005 36/16 A2987 RMK AO2 PK WND 15040/0545 LTG DSNT E-S FIBI (JH)
09	2251	MET16707/09/21 22:51:02 METAR KPHX 100551Z 14018G40KT 1/4SM R07L/2600VP6000FT DS VV005 35/16 A2987 RMK AO2 PK WND 15040/0545 LTG DSNT E-SW SLP090 T03500161 10444 20350 53049
09	2258	MET15207/09/21 22:58:02 SPECI KPHX 100558Z 13017G31KT 1/2SM R07L/2600V4500FT DS VV005 34/15 A2987 RMK AO2 PK WND 12031/0553 WSHFT 0539 LTG DSNT E-SW T03440150
09	2300	SYN09272278 31204 /1418 10350 20161 39718 40090 53049 734// 90551 333 10444 20350 91040 555 91006=
09	2308	MET20507/09/21 23:08:02 SPECI KPHX 100608Z 15015G23KT 1SM R07L/6000VP6000FT BLDU OVC008 34/15 A2985 RMK AO2 PK WND 12031/0553 WSHFT 0539 LTG DSNT SE-SW CONS LTGICCG DSNT SE-SW BLDU OVC008 CB DSNT SE-SW T03390150
09	2314	MET19407/09/21 23:14:02 SPECI KPHX 100614Z 15019G27KT 5SM BLDU SCT008 BKN050 34/16 A2984 RMK AO2 PK WND 12031/0553 WSHFT 0539 LTG DSNT SE-SW CONS LTGICCG DSNT SE-SW BLDU SCT008 CB DSNT SE-SW T03390161
09	2351	MET19307/09/21 23:51:02 METAR KPHX 100651Z 19015KT 10SM SCT060 BKN120 OVC180 36/16 A2983 RMK AO2 PK WND 12031/0553 WSHFT 0539 LTG DSNT S SLP076 CONS LTGICCG DSNT S-SW CB DSNT S-SW T03560161 404440339

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Local Climatological Data
Hourly Precipitation
July 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W

Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Date	For Hour (LST) Ending at																							Date
	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	NOON	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	MID	
01																								T	01
02	T																								02
03																				0.19	0.02	0.04	0.01	T	03
04																									04
05																									05
06																									06
07																									07
08																									08
09																									09
10																					T				10
11																									11
12																									12
13																									13
14					T	0.01	T	0.08	0.01																14
15																									15
16									0.01		T	T													16
17																									17
18																									18
19																									19
20																									20
21																									21
22																					0.13	0.07	0.01	T	22
23			T	T	0.02	0.14	T	0.02	0.02	0.07	0.06	0.10	0.15	0.15	0.04	0.01	0.02	T							23
24					0.09	0.06		0.01	0.01		T													0.01	24
25	0.06	0.01			T	0.03							T	0.01											25
26																									26
27																									27
28																									28
29																									29
30		T	T																					0.01	30
31	0.01	0.04	T																						31

Maximum Short Duration Precipitation

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (inches)	0.08	0.14	0.17	0.18	0.19	0.20	0.21	0.23	0.29	0.33	0.37	0.41
Ending Date Time (yyyy-mm-dd hh:mi)	2021-07-03 19:35	2021-07-03 19:38	2021-07-03 19:41	2021-07-03 19:45	2021-07-03 19:54	2021-07-03 20:10	2021-07-03 20:14	2021-07-23 13:32	2021-07-23 13:32	2021-07-23 13:46	2021-07-23 13:58	2021-07-23 14:19

Hourly, daily, and monthly totals on the Daily Summary page and the Hourly Precipitation Table are shown as reported by the instrumentation at the site. However, NWS does not edit hourly values for its ASOS sites, but may edit the daily and monthly totals for selected sites which will be reflected on the Daily Summary page.

T = Trace
s = Suspect
* = Erroneous
blank = No precipitation observed
M = Missing

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Local Climatological Data
Daily Summary
October 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W
Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH / Direction = Degrees			
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type	TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01	91	69	80	-3.2	28	42	59	0	15	0622	1813		0.00			28.78	29.91	5.5	20	080	15	090
02	94	67	81	-1.7	28	43	60	0	16	0623	1811		0.00			28.77	29.91	4.2	20	060	16	060
03	96	69	83	0.7	28	46	62	0	18	0624	1810		0.00			28.74	29.86	3.5	17	010	14	110
04	98*	74	86	4.1	30	49	64	0	21	0624	1809	RA	T			28.72	29.85	7.7	29	270	23	270
05	85	68	77	-4.5	52	59	66	0	12	0625	1807	TS RA	0.28			28.72	29.85	7.6	26	020	20	270
06	90	68	79	-2.1	45	54	64	0	14	0626	1806		0.00			28.72	29.86	4.5	18	130	13	130
07	91	71	81	0.3	37	51	63	0	16	0626	1805		0.00			28.74	29.87	5.7	27	350	14	170
08	92	72	82	1.7	36	52	64	0	17	0627	1803		0.00			28.72	29.86	8.1	27	310	21	280
09	85	69	77	-2.8	29	41	58	0	12	0628	1802		0.00			28.69	29.83	8.0	21	280	15	270
10	85	62	74	-5.4	24	33	53	0	9	0629	1801		0.00			28.70	29.84	4.2	16	340	10	290
11	88	61	75	-4.0	28	36	54	0	10	0629	1800	RA DU HZ	0.04			28.46	29.60	12.5	46	270	35	270
12	71	57	64	-14.6	25	26	46	1	0	0630	1758	DU HZ	0.00			28.61	29.77	9.0	37	260	28	270
13	75	52*	64	-14.2	30	31	49	1	0	0631	1757		0.00			28.69	29.85	4.2	22	350	10	260
14	79	55	67	-10.8	29	32	50	0	2	0632	1756		0.00			28.79	29.93	5.8	15	240	12	230
15	84	56	70	-7.4	21	26	51	0	5	0633	1755		0.00			28.87	30.02	7.0	25	050	18	050
16	92	58	75	-2.0	17	27	53	0	10	0633	1753		0.00			28.79	29.94	7.2	25	080	18	070
17	90	67	79	2.4	22	35	56	0	14	0634	1752		0.00			28.74	29.87	6.3	23	300	16	270
18	86	63	75	-1.2	33	42	57	0	10	0635	1751		0.00			28.66	29.79	9.4	28	270	23	270
19	80	61	71	-4.8	37	42	55	0	6	0636	1750		0.00			28.76	29.90	4.1	25	320	12	280
20	85	59	72	-3.4	34	42	56	0	7	0636	1749		0.00			28.84	29.99	3.5	19	340	12	080
21	89	60	75	0.0	31	41	56	0	10	0637	1748		0.00			28.84	29.99	4.4	22	340	10	300
22	89	63	76	1.4	29	39	56	0	11	0638	1746		0.00			28.71	29.85	4.4	18	310	10	290
23	85	60	73	-1.2	31	39	55	0	8	0639	1745		0.00			28.61	29.75	6.0	17	080	12	070
24	87	63	75	1.2	32	41	56	0	10	0640	1744		0.00			28.67	29.80	5.6	20	010	12	130
25	90	63	77	3.5	36	47	60	0	12	0641	1743		0.00			28.63	29.77	8.1	26	260	21	260
26	77	60	69	-4.1	32	36	53	0	4	0641	1742		0.00			28.76	29.88	12.1	29	270	22	280
27	79	56	68	-4.7	25	29	49	0	3	0642	1741		0.00			28.90	30.05	3.1	15	300	12	300
28	88	55	72	-0.3	26	34	53	0	7	0643	1740		0.00			28.82	29.97	3.8	15	080	12	080
29	93	64	79	7.1	23	34	55	0	14	0644	1739		0.00			28.71	29.85	3.6	20	070	14	080
30	89	61	75	3.5	23	33	54	0	10	0645	1738		0.00			28.71	29.84	4.2	12	100	9	120
31	88	62	75	3.9	26	38	55	0	10	0646	1737		0.00			28.73	29.87	6.0	22	330	12	200
	86.8	62.7	74.8							Monthly Averages | Totals			0.32			28.73	29.87	6.0				
	-1.7	-2.1	-1.9	Departure from Normal (1981-2010)									-0.26									

Degree Days

	Monthly		Season-to-date	
	Total	Departure	Total	Departure
Heating	2	-4	2	
Cooling	305	-62	4693	

Number of days with...

	Temperature				Precipitation		Snow	Weather	
	Max		Min						
	>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
Heating									
Cooling	11	0	0	0	2	1		1	

Date of 5-sec to 3-sec wind equipment change

2007-04-03

Sea Level Pressure

		Date	Time
Maximum	30.15	27	0936
Minimum	29.40	11	2151

Greatest...

24-Hr...		Snow Depth
Precip	Snowfall	
0.28		
Date		
05-05		

Station Augmentation

Name:CONTRACTOR Lat: 33.4442 Lon: -112.0247 Elevation: N/A Distance: 0.5mi N Elements: TEMP, PRECIP Equipment: MXMN, SRG

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W
Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Local Climatological Data
Hourly Observations
October 2021

Generated on 09/15/2023

Max Hourly Wind Speed

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Date	Time (LST)	Station Type	Sky Conditions	Visibility	Weather Type (see documentation)	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Hum %	Wind Speed (MPH)	Wind Dir (Deg)	Wind Gusts (MPH)	Station Press (inHg)	Press. Tend	Net 3-Hr Change (inHg)	Sea Level Press. (inHg)	Report Type	Precip Total (in)	Altimeter Setting (inHg)
					AU | AW | MW	(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
11	0051	7	CLR:00	10.00		68	20.0	53	11.7	38	3.3	33	7	100		28.64			29.76	FM-15	0.00	29.81
11	0151	7	CLR:00	10.00		65	18.3	52	11.1	40	4.4	40	3	160		28.63	8	+0.02	29.76	FM-15	0.00	29.80
11	0251	7	FEW:02 30	10.00		65	18.3	53	11.7	41	5.0	42	5	100		28.61			29.74	FM-15	0.00	29.78
11	0351	7	CLR:00	10.00		64	17.8	51	10.6	39	3.9	40	8	120		28.61			29.74	FM-15	0.00	29.78
11	0451	7	CLR:00	10.00		63	17.2	51	10.6	40	4.4	43	8	110		28.60	6	+0.02	29.73	FM-15	0.00	29.77
11	0500	4		9.94		63	17.2	51	10.6	40	4.4	43	8	110		28.60	6	+0.02	29.73	FM-12		
11	0551	7	CLR:00	10.00		62	16.7	50	10.0	39	3.9	43	8	110		28.60			29.73	FM-15	0.00	29.77
11	0651	7	CLR:00	10.00		61	16.1	50	10.0	38	3.3	43	9	090		28.60			29.73	FM-15	0.00	29.77
11	0751	7	CLR:00	10.00		64	17.8	51	10.6	38	3.3	38	10	110		28.59	8	+0.01	29.72	FM-15	0.00	29.76
11	0851	7	FEW:02 250	10.00		69	20.6	53	11.7	37	2.8	31	8	110		28.59			29.72	FM-15	0.00	29.76
11	0951	7	FEW:02 250	10.00		74	23.3	54	12.2	34	1.1	23	11	160		28.58			29.70	FM-15	0.00	29.75
11	1051	7	FEW:02 250	10.00		77	25.0	55	12.8	34	1.1	21	10	150	20	28.57	8	+0.03	29.69	FM-15	0.00	29.74
11	1100	4		9.94		77	25.0	55	12.8	34	1.1	21	10	150		28.57	8	+0.03	29.69	FM-12		
11	1151	7	FEW:02 250	10.00		82	27.8	57	13.9	33	0.6	17	8	VRB		28.52			29.65	FM-15	0.00	29.69
11	1251	7	FEW:02 250	10.00		83	28.3	56	13.3	30	-1.1	15	10	VRB	18	28.48			29.60	FM-15	0.00	29.65
11	1351	7	FEW:02 250	10.00		87	30.6	58	14.4	30	-1.1	13	11	180	25	28.43	8	+0.13	29.55	FM-15	0.00	29.60
11	1451	7	FEW:02 250	10.00		87	30.6	57	13.9	28	-2.2	12	11	240	22	28.39			29.51	FM-15	0.00	29.56
11	1551	7	FEW:02 100 FEW:02 250	10.00		87	30.6	57	13.9	26	-3.3	11	15	220	25	28.37			29.48	FM-15	0.00	29.53
11	1651	7	FEW:02 100	10.00		85	29.4	56	13.3	27	-2.8	12	21	210	29	28.33	8	+0.11	29.44	FM-15	0.00	29.49
11	1700	4		9.94		85	29.4	56	13.3	27	-2.8	12	21	210		28.33	8	+0.11	29.44	FM-12		
11	1751	7	SCT:04 80	10.00		83	28.3	58	14.4	35	1.7	18	14	210		28.31			29.43	FM-15	0.00	29.47
11	1851	7	FEW:02 80	10.00		81	27.2	57	13.9	37	2.8	21	18	200	28	28.30			29.42	FM-15	0.00	29.46
11	1951	7	FEW:02 80	10.00		79	26.1	57	13.9	37	2.8	22	18	210	32	28.31	5	+0.01	29.43	FM-15	0.00	29.47
11	2051	7	CLR:00	10.00		77	25.0	56	13.3	38	3.3	24	22	200	39	28.29			29.41	FM-15	0.00	29.45
11	2151	7	SCT:04 80 SCT:04 200	10.00		75	23.9	57	13.9	43	6.1	32	20	180	33	28.28			29.40	FM-15	0.00	29.44
11	2244	7	SCT:04 30 OVC:08 75	3.00	-RA:02 BL:5 DU:5 |RA |RA	67	19.4	55	12.8	45	7.2	45	28	280	46	28.35				FM-16	T	29.51
11	2251	7	SCT:04 27 OVC:08 75	2.50	+RA:02 BL:5 DU:5 |RA |RA	62	16.7	56	13.3	51	10.6	67	21	270	38	28.37	3	-0.06	29.49	FM-15	T	29.53
11	2256	7	BKN:07 41 OVC:08 75	3.00	-RA:02 BL:5 DU:5 |RA |RA	63	17.2	55	12.8	49	9.4	60	13	260		28.37				FM-16		29.53
11	2300	4	26	2.49	||RA	62	16.7	56	13.3	51	10.6	67	21	270		28.37	3	-0.06	29.49	FM-12		
11	2320	7	BKN:07 30 OVC:08 70	2.50	BL:5 DU:5 ||	65	18.3	53	11.7	43	6.1	45	20	280	29	28.39				FM-16	0.04	29.56
11	2328	7	BKN:07 28 OVC:08 70	2.50	BL:5 DU:5 ||	65	18.3	51	10.6	36	2.2	34	21	290		28.39				FM-16	0.04	29.56
11	2351	7	BKN:07 28 OVC:08 70	2.50	DU:5 |HZ |FU	64	17.8	48	8.9	29	-1.7	27	21	260	28	28.40			29.53	FM-15	0.04	29.57

Max Hourly Wind Gust Speed

Max Hourly Wind Speed

Max 24-Hour Wind Speed

Max 24-Hour Wind Gust Speed

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Local Climatological Data
Hourly Remarks
October 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W
Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Date	Time (LST)	Remarks
11	0051	MET09610/11/21 00:51:02 METAR KPHX 110751Z 10006KT 10SM CLR 20/03 A2981 RMK AO2 SLP079 T02000033 (ADH)
11	0151	MET10210/11/21 01:51:02 METAR KPHX 110851Z 16003KT 10SM CLR 18/04 A2980 RMK AO2 SLP077 T01830044 58008 (ADH)
11	0251	MET10910/11/21 02:51:02 METAR KPHX 110951Z 10004KT 10SM FEW030 18/05 A2978 RMK AO2 SLP071 FU FEW030 T01830050 (ADH)
11	0351	MET09610/11/21 03:51:02 METAR KPHX 111051Z 12007KT 10SM CLR 18/04 A2978 RMK AO2 SLP070 T01780039 (ADH)
11	0451	MET11410/11/21 04:51:02 METAR KPHX 111151Z 11007KT 10SM CLR 17/04 A2977 RMK AO2 SLP068 T01720044 10211 20172 56008 (ADH)
11	0500	SYN08072278 32966 01107 10172 20044 39685 40068 56008 91151 333 10294 20172 555 91112=
11	0551	MET09610/11/21 05:51:02 METAR KPHX 111251Z 11007KT 10SM CLR 17/04 A2977 RMK AO2 SLP069 T01670039 (ADH)
11	0651	MET09510/11/21 06:51:02 METAR KPHX 111351Z 09008KT 10SM CLR 16/03 A2977 RMK AO2 SLP067 T01610033 (DZ)
11	0751	MET10110/11/21 07:51:02 METAR KPHX 111451Z 11009KT 10SM CLR 18/03 A2976 RMK AO2 SLP065 T01780033 58003 (DZ)
11	0851	MET09810/11/21 08:51:02 METAR KPHX 111551Z 11007KT 10SM FEW250 21/03 A2976 RMK AO2 SLP064 T02060028 (DZ)
11	0951	MET09810/11/21 09:51:02 METAR KPHX 111651Z 16010KT 10SM FEW250 23/01 A2975 RMK AO2 SLP059 T02330011 (DZ)
11	1051	MET11910/11/21 10:51:02 METAR KPHX 111751Z 15009G17KT 10SM FEW250 25/01 A2974 RMK AO2 SLP055 T02500011 10250 20161 58009 (DZ)
11	1100	SYN08672278 32966 21509 10250 20011 39675 40055 58009 91751 333 10250 20161 91017 555 91118=
11	1151	MET09810/11/21 11:51:02 METAR KPHX 111851Z 17007KT 10SM FEW250 28/01 A2969 RMK AO2 SLP039 T02780006 (DZ)
11	1251	MET10210/11/21 12:51:02 METAR KPHX 111951Z 19009G16KT 10SM FEW250 28/M01 A2965 RMK AO2 SLP024 T02831011 (DZ)
11	1351	MET10810/11/21 13:51:02 METAR KPHX 112051Z 18010G22KT 10SM FEW250 31/M01 A2960 RMK AO2 SLP006 T03061011 58045 (DZ)
11	1451	MET10210/11/21 14:51:02 METAR KPHX 112151Z 24010G19KT 10SM FEW250 31/M02 A2956 RMK AO2 SLP994 T03061022 (JH)
11	1551	MET12710/11/21 15:51:02 METAR KPHX 112251Z 22013G22KT 10SM FEW100 FEW250 31/M03 A2953 RMK AO2 PK WND 19030/2230 SLP983 T03061033 (JH)
11	1651	MET13810/11/21 16:51:02 METAR KPHX 112351Z 21018G25KT 10SM FEW100 29/M03 A2949 RMK AO2 PK WND 22027/2331 SLP970 T02941028 10311 20250 58036 (JH)
11	1700	SYN08672278 32966 22118 10294 21028 39594 49970 58036 92351 333 10311 20172 91025 555 91200=
11	1751	MET10410/11/21 17:51:01 METAR KPHX 120051Z 21012KT 10SM SCT080 28/02 A2947 RMK AO2 SLP966 BLDU ALQDS T02830017
11	1851	MET09610/11/21 18:51:01 METAR KPHX 120151Z 20016G24KT 10SM FEW080 27/03 A2946 RMK AO2 SLP963 T02720028
11	1951	MET12010/11/21 19:51:02 METAR KPHX 120251Z 21016G28KT 10SM FEW080 26/03 A2947 RMK AO2 PK WND 21030/0239 SLP965 T02610028 55005
11	2051	MET11110/11/21 20:51:02 METAR KPHX 120351Z 20019G34KT 10SM CLR 25/03 A2945 RMK AO2 PK WND 21034/0350 SLP959 T02500033
11	2151	MET12110/11/21 21:51:02 METAR KPHX 120451Z 18017G29KT 10SM SCT080 SCT200 24/06 A2944 RMK AO2 PK WND 17030/0432 SLP955 T02390061
11	2244	MET17010/11/21 22:44:02 SPECI KPHX 120544Z 28024G40KT 3SM -RA BLDU SCT030 OVC075CB 19/07 A2951 RMK AO2 PK WND 27040/0541 WSHFT 0527 RAB43 BLDU SCT030 CB W MOV E P0000 T01940072
11	2251	MET21210/11/21 22:51:02 METAR KPHX 120551Z 27018G33KT 2 1/2SM +RA BLDU SCT027 OVC075CB 17/11 A2953 RMK AO2 PK WND 27040/0541 WSHFT 0527 RAB43 PRESRR SLP986 BLDU SCT027 CB W MOV E 60000 T01670106 10294 20167 53019 PNO $
11	2256	MET14310/11/21 22:56:02 SPECI KPHX 120556Z 26011KT 3SM -RA BLDU BKN041 OVC075CB 17/09 A2953 RMK AO2 WSHFT 0538 BLDU BKN041 CB W MOV E T01720094 PNO $
11	2300	SYN09872278 11540 82718 10167 20106 39607 49986 53019 69901 765// 90551 333 10294 20167 91033 555 91206=
11	2320	MET14110/11/21 23:20:02 SPECI KPHX 120620Z 28017G25KT 2 1/2SM BLDU BKN030 OVC070 18/06 A2956 RMK AO2 WSHFT 0538 RAE05 BLDU BKN030 P0004 T01830061 $
11	2328	MET13810/11/21 23:28:02 SPECI KPHX 120628Z 29018KT 2 1/2SM BLDU BKN028 OVC070 18/02 A2956 RMK AO2 WSHFT 0538 RAE05 BLDU BKN028 P0004 T01830022 $
11	2351	MET15510/11/21 23:51:02 METAR KPHX 120651Z 26018G24KT 2 1/2SM DU BKN028 OVC070 18/M02 A2957 RMK AO2 WSHFT 0538 RAE05 SLP000 DU BKN028 P0004 T01781017 403110161 $

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Local Climatological Data
Hourly Precipitation
October 2021

Generated on 09/15/2023

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 1113 ft. Lat: 33.4278° N Lon: 112.0037° W

Station: **PHOENIX AIRPORT, AZ US WBAN:23183 (ICAO:KPHX)**

Date	For Hour (LST) Ending at																							Date
	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	NOON	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	MID	
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Maximum Short Duration Precipitation

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (inches)	0.27	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Ending Date Time (yyyy-mm-dd hh:mi)	2021-10-05 18:17	2021-10-05 18:18	2021-10-05 18:18	2021-10-05 18:18	2021-10-05 18:18	2021-10-05 18:18	2021-10-05 18:18	2021-10-05 18:18	2021-10-05 18:18	2021-10-05 18:18	2021-10-05 18:18	2021-10-05 18:18

Hourly, daily, and monthly totals on the Daily Summary page and the Hourly Precipitation Table are shown as reported by the instrumentation at the site. However, NWS does not edit hourly values for its ASOS sites, but may edit the daily and monthly totals for selected sites which will be reflected on the Daily Summary page.

T = Trace
s = Suspect
* = Erroneous
blank = No precipitation observed
M = Missing