COMMUNITY AIR MONITORING REPORT (FEBRUARY 2019-MARCH 2020)

Community of Shafter

San Joaquin Valley Air Pollution Control District

July 20, 2020

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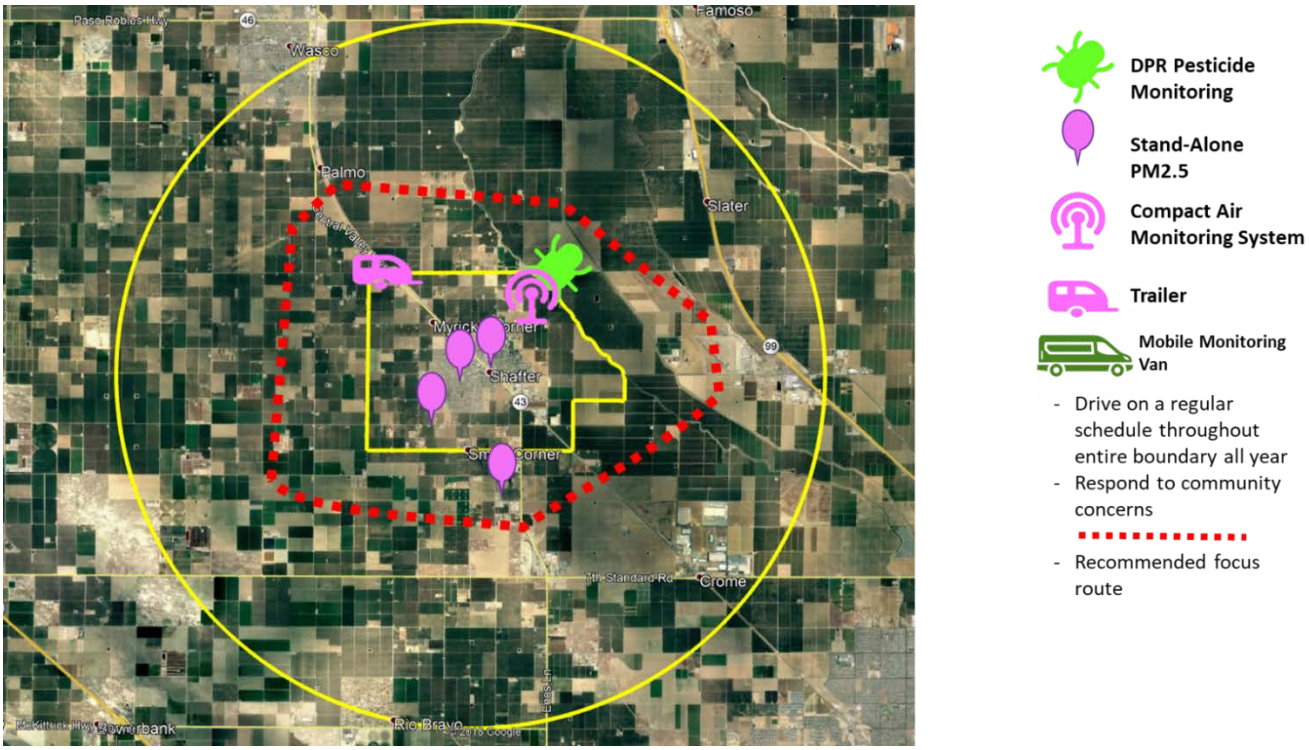
I. Community Air Monitoring and Status of Network Deployment

Assembly Bill (AB) 617, signed into law in July 2017, has resulted in a statewide effort to reduce air pollution and improve public health in communities that experience disproportionate burdens from exposure to air pollutants statewide through new community-focused and community-driven actions. AB 617 provides mechanisms and resources to implement community-specific air quality monitoring networks, develop and implement emission reduction programs; improve availability of data and other technical information; and invest substantial funding in the community through voluntary incentive funding measures. Shafter, a rural community in Kern County, was selected as a first year community by CARB in September of 2018.

District staff provided assistance to the Community Steering Committee (CSC) members by helping them to develop their recommended air monitoring priorities. The District worked with CSC members as they reviewed and evaluated a variety of different resources, including maps of stationary sources, area sources, mobile sources, prevailing wind direction data, and sensitive receptor locations relative to sources of air pollution within the community. The CSC adopted their official recommendation in July 2019, including the deployment of various air monitoring platforms within the community as identified in Figure 1 below.

Figure 1 Shafter Community Air Monitoring Network Design



Community Air Monitoring Platforms and Equipment

The District has been working to site and deploy the following high-precision regulatory grade air monitoring systems and platforms, providing flexible options to meet air monitoring needs for the community air monitoring network:

- **Stand-Alone PM2.5 Monitors:** These fixed air monitoring analyzers will measure ambient PM2.5. These will be placed in their respective locations for sufficient lengths of time to capture annual and peak PM2.5 pollution trends throughout the community, unless monitoring priorities change and monitor relocation is necessary.

- **Compact Multi-Pollutant Air Monitoring System:** These compact air monitoring systems will operate as semi-mobile platforms. Each platform will be equipped with advanced air monitoring analyzers measuring various pollutants, with the ability to communicate the community-level air quality in real time.

- **Air Monitoring Trailer:** These air monitoring trailer systems will operate as semi-mobile platforms. This platform will be equipped with advanced air monitoring analyzers with the ability to communicate the community-level air quality in real time.

- **Mobile Air Monitoring Van:** The van is ideal for focusing on unmonitored areas of concern and regularly surveying the entire community within short timeframes, allowing for a better understanding of the spatial differences in air quality across the community. The air monitoring van can also be used for measuring pollution from on-road sources, and identifying sources of community-level air pollution. Additionally, the van can be parked in one location for longer periods of time to capture daily or weekly pollution from unmonitored areas within the community.

The air monitoring van is a useful tool for evaluation of a large geographic region, but these platforms are best designed for taking a short-term look at the measured pollutants when and where the monitoring occurred. The fixed and semi-mobile platforms are outfitted with instrumentation that is capable of more accurately measuring daily and long-term variations in pollutant concentrations. The use of both mobile and semi-mobile monitoring platforms will be necessary to capture the full picture of the community's air pollution profile.

These air monitoring systems will provide real-time hourly average readings of the following pollutants:

- **PM2.5**: PM2.5 can be composed of any material that has a diameter of 2.5 microns or less, and is considered "fine particulate matter." PM2.5 can be emitted directly as primary PM2.5 from various sources or formed secondarily

through chemical reactions in the atmosphere. Typically, directly emitted fine particulate matter is made up of small particles from exhaust or smoke, whereas secondary PM2.5 can form from NOx or VOC emissions from a variety of sources.

- **PM10**: PM10 can be composed of any material that has a diameter of 10 microns or less, and is considered "coarse particulate matter." PM10 can be emitted directly as primary PM10 from various sources or formed secondarily through chemical reactions in the atmosphere. Typically, directly emitted coarse particulate matter is made up of soil, dust, or large smoke particles, whereas secondary PM2.5 can form from NOx or VOC emissions from a variety of sources.

- **Black Carbon (BC)**: Black carbon is also known as soot or elemental carbon and formed during incomplete combustion in fuels, including mobile exhaust (mainly diesel), and wood burning

- **Nitrogen Oxides (NO, NO2, NOx)**: Nitrogen oxides (NOx) are chemical compounds formed by the combination of nitrogen and oxygen, and are primarily emitted through the combustion of fossil fuels from mobile and stationary sources

- **Volatile Organic Compounds (VOC):** VOCs are released through the burning of various fuels such as gasoline, wood, coal, or natural gas, and can also be released through the use of solvent based consumer products

- **Ozone:** Ozone is not emitted directly into the air, but is created by chemical reactions between NOx and VOC in the presence of heat and sunlight

- **Carbon Monoxide (CO):** CO is a colorless, odorless gas that can be harmful when inhaled in large amounts. The greatest sources of CO to outdoor air are cars, trucks and other vehicles or machinery that burn fossil fuels.

- **BTEX:** BTEX is a specified subset of VOCs containing benzene, toluene, ethylbenzene, and xylene. These chemicals appear naturally in crude oil and can be associated with emissions from petroleum refineries, and petroleum storage and fueling stations.

- **Sulfur Dioxide (SO2):** SO2 is a colorless gas with a pungent odor. Sulfur dioxide is produced largely by fossil fuel combustion.

- **Hydrogen Sulfide (H2S):** H2S is a colorless gas characterized by its foul odor of rotten eggs and can be smelled at low concentrations. Hydrogen sulfide is often produced from the breakdown of organic matter in the absence of oxygen gas, such as in swamps, sewers, and in the crude oil extraction/refining process.

The Shafter community air monitoring also includes the capturing of air samples using canisters and filters that are sent to third party laboratories to be analyzed for VOC and PM2.5 compounds and species present in the local air.

Status of Shafter Community Air Monitoring Network

Consistent with the community recommended air monitoring network design, the District is in various stages of installing air monitoring systems in the locations identified in the community air monitoring plan. The progress in implementing the community air monitoring network in Shafter is listed below:

Shafter DMV (PM2.5, PM10, VOC/PM2.5 Speciation)

The District has placed multiple monitors on the roof at the Shafter DMV on the corner of Walker Street and Pacific Avenues. The District first began operation of a real time PM2.5 analyzer in February 2019. Subsequently, a PM10 monitor was installed and operated from August 2019 through December 2019 to monitor this pollutant during the peak of the harvest season. Data collected from these monitors are available on the District's Shafter AB 617 air monitoring webpage and are being uploaded to CARB's AQview portal on a regular basis. In December 2019 and January 2020, the District also began operating VOC and PM2.5 speciation sampling, respectively, at this location to begin to build an understanding of the relative comparison between the constituents that comprise the VOC and PM2.5 concentrations present in the community.

Grimmway Academy (PM2.5)

The District has placed a real-time PM2.5 monitor (Met One BAM-1022) on the roof at Grimmway Academy on the corner of W. Los Angeles and S. Schnaidt Street. Operation of this analyzer began in July 2019. Data collected from this site is available on the District's Shafter AB 617 air monitoring webpage and is being uploaded to CARB's AQview portal on a regular basis.

Sequoia Elementary (Compact Multi-Pollutant System)

The District has been in discussion with Richland School District (RSD) in regards to placing an Air Pointer compact multi-pollutant air monitoring system at Sequoia Elementary School on the corner of Fresno and Mannel Avenue. The District has provided a contract with RSD and is currently waiting for authorized signatures to move forward with deployment. In the interim, the air monitoring van is being utilized to monitor areas nearby the school. In addition, the District is looking at alternative locations near the school to begin air monitoring operations, while continuing to work with RSD on allowing the air monitor to be installed, or should an agreement with the school district not be reached.

Golden Oak Elementary (PM2.5)

The District has been in discussion with Richland School District (RSD) in regards to placing a real-time PM2.5 monitor at Golden Oak Elementary School on the corner of S. Wall Street and Lerdo Highway. The District has provided a contract with RSD and is currently waiting for authorized signatures to move forward with deployment. In the interim, the air monitoring van is being utilized to monitor areas nearby the school. In addition, the District is looking at alternative locations near the school to begin air monitoring operations, while continuing to work with RSD on allowing the air monitor to be installed, or should an agreement with the school district not be reached.

North Shafter Farm Labor Center (Air Monitoring Trailer)

The District has been working with the Housing Authority of the County of Kern to install the air monitoring trailer at the North Shafter Farm Labor Center on the corner of Highway 43 and Merced Avenue. The District has provided a contract with the Housing Authority of the County of Kern and is currently waiting for authorized signatures to move forward with deployment. In the interim, the air monitoring van is being utilized to monitor areas near the site.

Mexican Colony (PM2.5)

Due to challenges in finding a secure location with access to power to operate a PM2.5 analyzer in the community of Mexican Colony, the District has been using the air monitoring van regularly to measure PM2.5 and other pollutants in this area of Shafter. The results of these measurements are summarized later in this report.

Mobile Air Monitoring Van Routes

In addition to the semi-mobile and fixed platforms, the District has been maximizing the usage of the considerable air monitoring capabilities of the air monitoring van to measure a variety of air pollutants of concern throughout the community. Measurements taken with the air monitoring van will allow the District and the community steering committee to understand local air pollution in the communities while also giving the District the ability to rapidly respond to air pollution concerns in other unmonitored regions. Intensive air monitoring operations with the mobile van began in January 2020. As mentioned earlier, the air monitoring van has enabled the District to commence air monitoring activities in areas that are still awaiting approval for installation of semi-mobile and fixed air monitoring equipment.

II. Summary of PM2.5 Air Monitoring

During this reporting period, concentrations of hourly PM2.5 were measured at the air monitoring sites of Shafter DMV and Grimmway Academy within the Shafter community boundary. The results of these measurements are summarized in the following table,

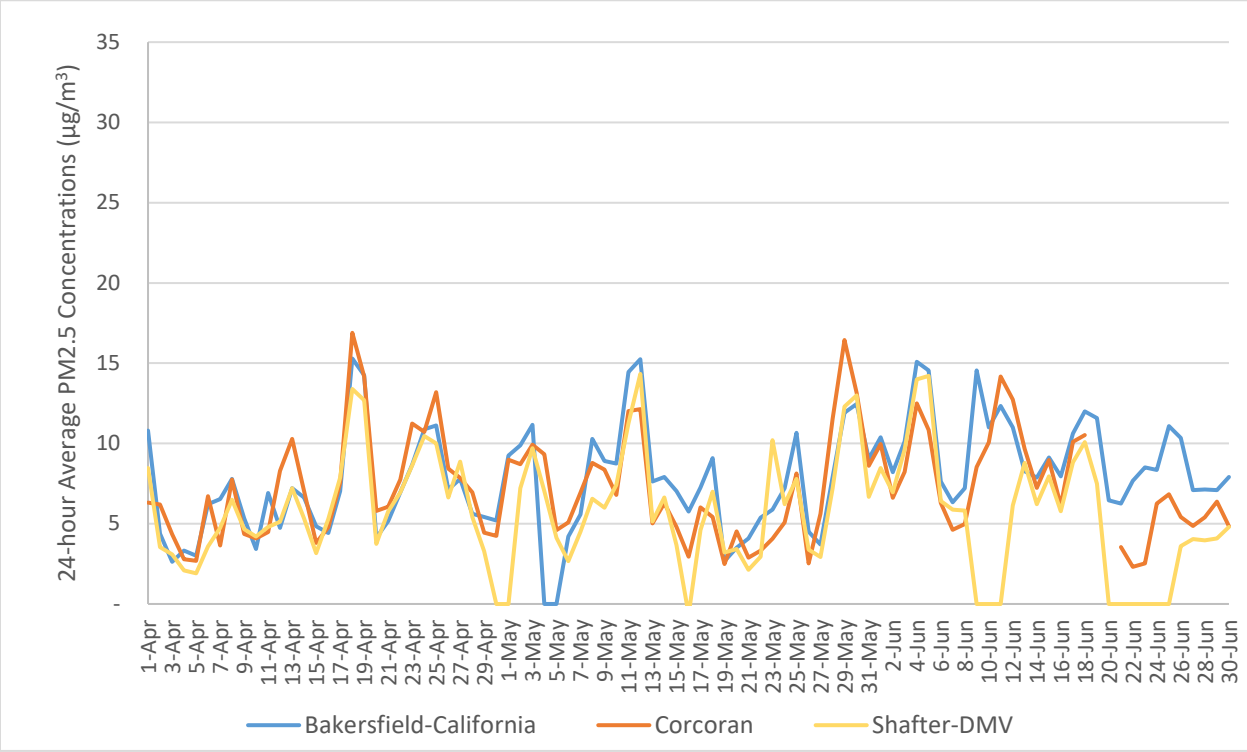
along with a comparison of other nearby cities with PM2.5 analyzers, and displayed in more detail in Appendix A to this report. Overall, through the period these sites experienced very few days when the federal 24-hour average standard of 35 µg/m^3 was exceeded, with most of these exceedances being influenced by fireworks emissions and high wind events. PM2.5 measurements across the community were fairly consistent and did not result in the observation of any concerning concentrations outside of the fireworks and high-wind events.

Quarterly 24-Hour Average PM2.5 (µg/m^3)

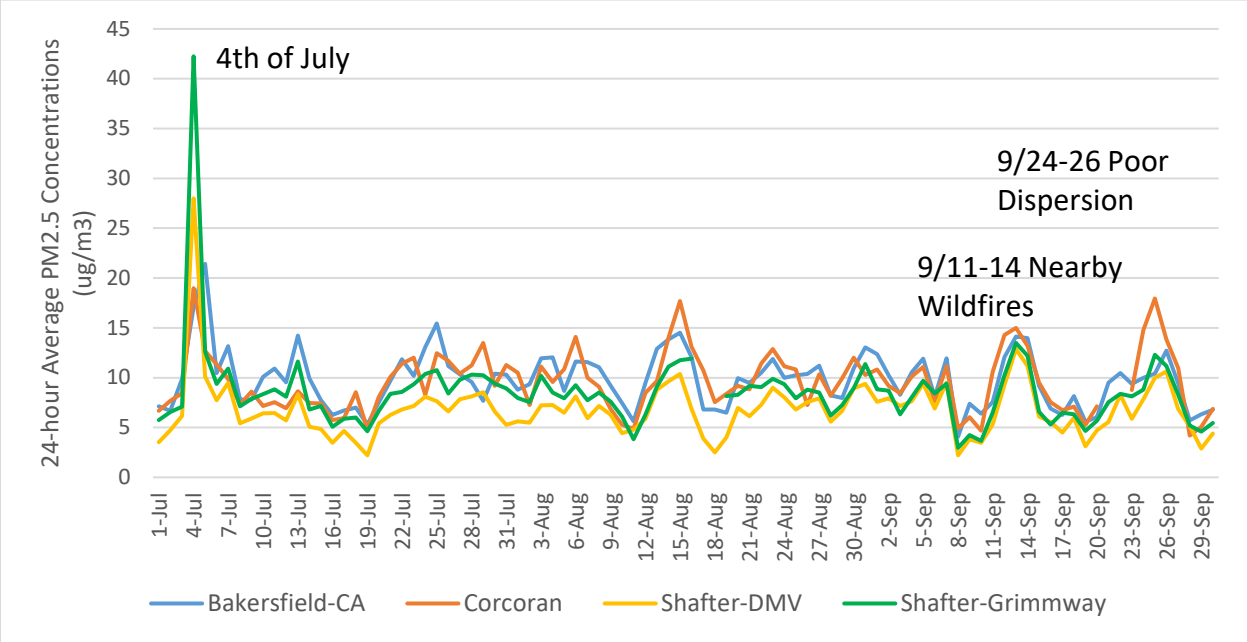
Quarter	Shafter-DMV	Shafter-Grimmway Academy	Bakersfield-California	Corcoran
2019 Q2	6.29	--	8.07	7.24
2019 Q3	6.83	8.54	9.81	9.62
2019 Q4	12.19	13.22	16.23	18.4
2020 Q1	10.0	10.3	13.3	13.9

The following provides a comparison of daily PM2.5 measurements during this period between the sites of Shafter DMV and Grimmway Academy and the nearby Corcoran and Bakersfield air monitoring sites just north and south of the community boundary, respectively.

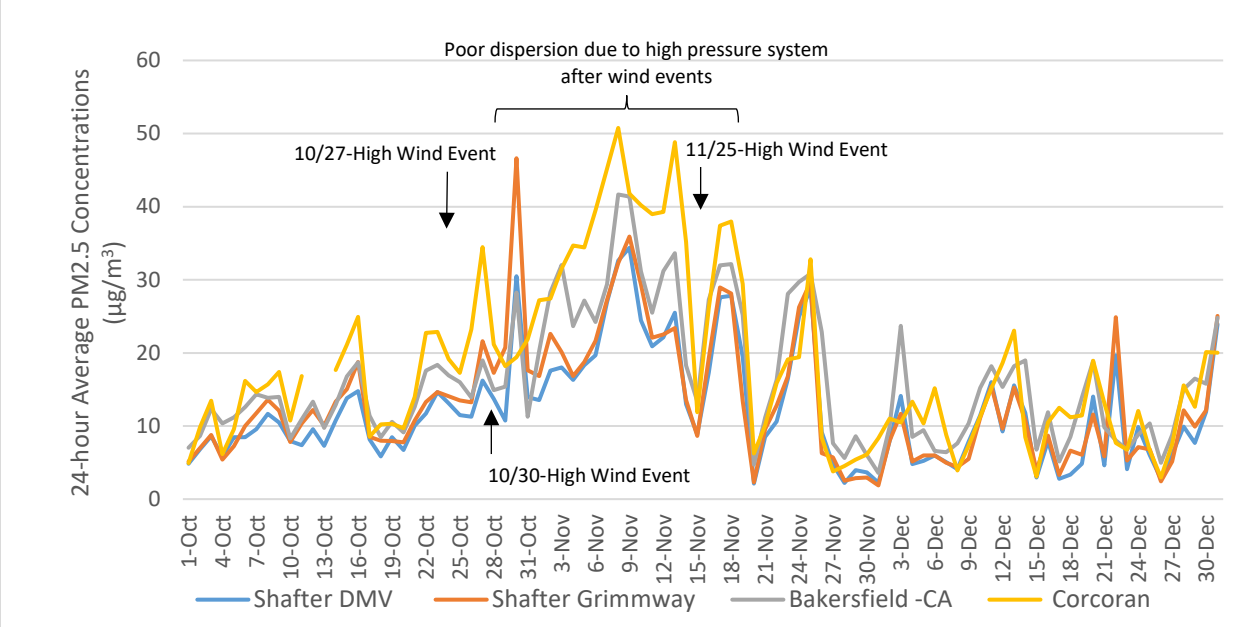
2019 Q2 Daily PM2.5 at Shafter-DMV, Bakersfield-California, and Corcoran



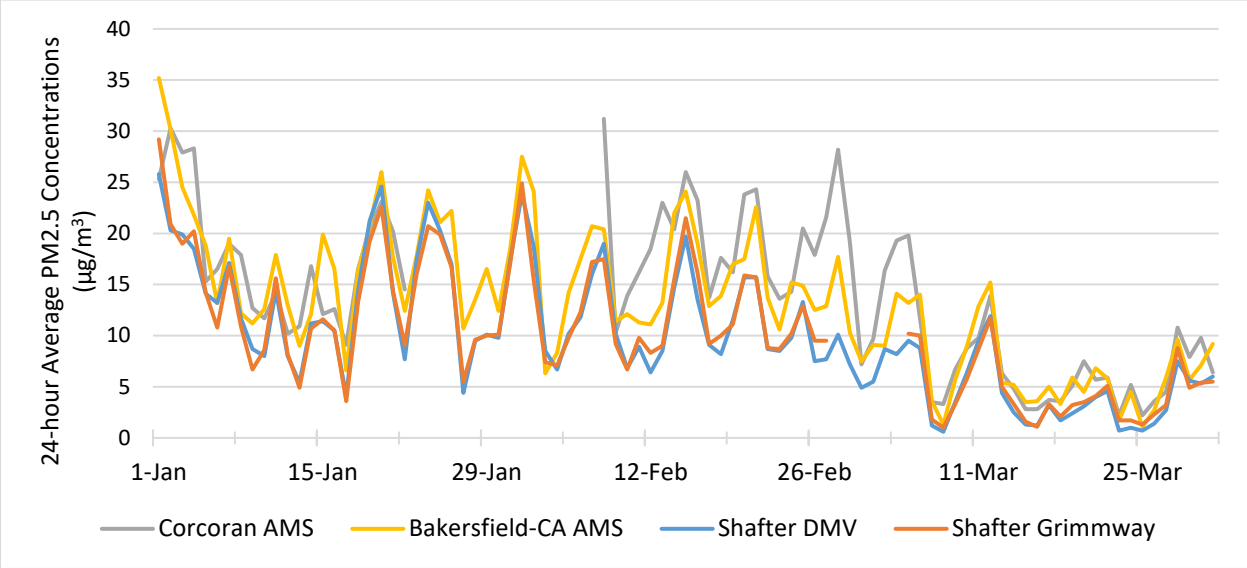
2019 Q3 Daily PM2.5 at Shafter-DMV, Shafter-Grimmway, Bakersfield-California, and Corcoran



2019 Q4 Daily PM2.5 at Shafter-DMV, Shafter-Grimmway, Bakersfield- California, and Corcoran



2020 Q1 Daily PM2.5 at Shafter-DMV, Shafter-Grimmway, Bakersfield- California, and Corcoran

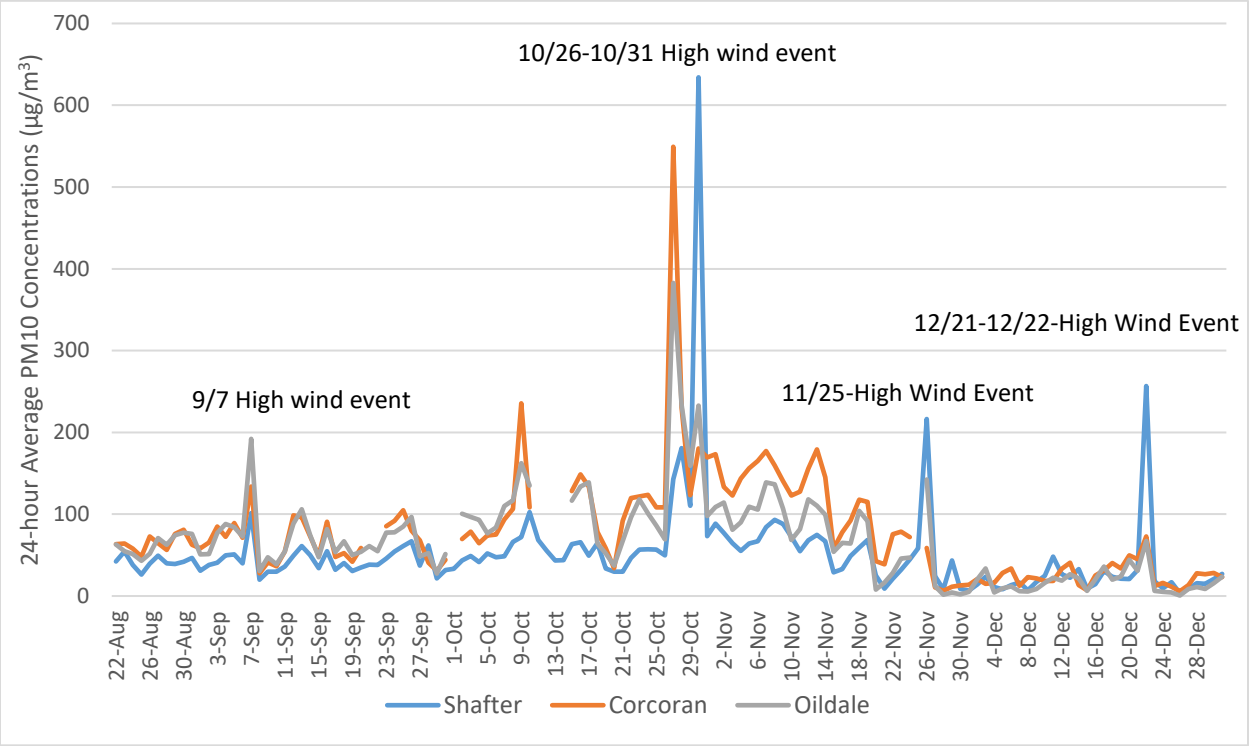


III. Summary of PM10 Air Monitoring

During this reporting period, as requested by the steering committee, concentrations of hourly PM10 were measured at the Shafter DMV during the harvest season from August to December 2019. The results of these measurements are summarized in the following table, and displayed in more detail in Appendix A of this report. Overall, through the period the Shafter DMV site experienced very few days when the federal 24-hour average standard of 150 µg/m^3 was exceeded, with all of these exceedances being influenced by high wind events. There were no observations of any concerning concentrations outside of these exceptional events.

The following provides a comparison of daily PM10 measurements during this period between the sites of Shafter DMV and the closest PM10 air monitoring sites located in Corcoran and Oildale.

2019 Daily PM10 at Shafter-DMV, Corcoran, and Oildale



Site	Average PM10 Concentration (µg/m³)
Oildale	68
Corcoran	78
Shafter-DMV	52

IV. Summary of Data Collected using Mobile Air Monitoring Van

In addition to the expanded PM2.5 measurements that have been occurring in the Shafter community, the District has been taking advantage of the considerable air monitoring capabilities of the mobile air monitoring van to measure a variety of air pollutants throughout the community

The air monitoring van is ideal for taking measurements in unmonitored areas of concern and for regular surveillance over the entire community of Shafter in short timeframes. The air monitoring van has also enabled the District to commence air monitoring activities in areas that are still awaiting approval for installation of semi-mobile and fixed air monitoring equipment.

In January 2020, the air monitoring van was used to measure a variety of air pollutants within the Shafter community in the map below. The yellow circle boundary in the map was identified by the Shafter community steering committee as an area of interest for taking air quality measurements with the mobile air monitoring van.

CSC Recommended Areas of Interest for using Mobile Air Monitoring Van

Site A: North of Shafter in agriculture area.

Site B: West of Shafter located near dairy operations

Site C: East of Shafter located near the industrial/airport area near Highway 99 and Lerdo Highways

Site D: South of Shafter focusing on the Mexican Colony community

Following the January 2020 air monitoring van campaign described above, in March 2020 the District focused its efforts using the air monitoring van to monitor emissions near the aforementioned sites that are awaiting approval for installation of semi-mobile and fixed air monitoring equipment.

The concentrations of pollutants measured with the air monitoring van at all locations described above were well below federal air quality standards during these periods, as summarized below. Note that although BTEX compounds were being measured by the air monitoring van during this period, concentrations of these compounds were not high enough to be detected by the analyzer.

Average and Peak Pollutant Concentrations in Areas Monitored with the Mobile Air Monitoring Van (January 2020, March 2020)

Pollutant	Overall Average Value	Peak 1-hr Average Value	Applicable Standard
BTEX	None detected	None detected	n/a
PM2.5	5.8 µg/m^3	14.5 µg/m^3	35 µg/m^3 (24-hr average)
Ozone	21.3 ppb	40.1 ppb	70 ppb (8-hr average)
CO	0.17 ppm	0.3 ppm	35 ppm (1-hr average)
NO2	5.8 ppb	29.6 ppb	100 ppb (1-hr average)
SO2	1.0 ppb	4.7 ppb	75 ppb (1-hr average)
H2S	0.7 ppb	5.1 ppb	n/a

Appendix B to this report includes more details of daily measurements at each location using the mobile air monitoring van during the January and March 2020 timeframes.

V. Summary of PM2.5 Speciation Analysis

To build a fuller understanding of the various constituents that comprise the overall PM2.5 concentrations in the Shafter community, and their relative comparison, in January 2020 the District began operating PM2.5 speciation sampling at the Shafter-DMV site near the intersection of Walker Street and Pacific Avenues. The collected samples were sent to a third-party laboratory for analysis to determine the contribution of various species of PM2.5 to the overall measured PM2.5 mass.

The nature and formation of PM2.5 in the San Joaquin Valley is highly complex as it can be composed of any material that has a diameter of 2.5 microns or less. PM2.5 can be emitted directly as primary PM2.5 from various sources or formed secondarily through chemical reactions in the atmosphere. The resulting ambient PM2.5 mixture can include aerosols (fine airborne solid particles and liquid droplets) consisting of components of nitrates, sulfates, organic carbon, black carbon, soil, trace metals, and more.

PM2.5 in the Valley is comprised of many species that contribute to the total PM2.5 mass. This complex mixture is attributable to emissions from stationary, mobile, and area-wide sources, as well as naturally occurring emissions. Although the list of species contributing to PM2.5 in the Valley is lengthy, it can be grouped into larger representative categories. The following is a brief description of each of these larger species categories:

- **Ammonium Nitrate:** Ammonium nitrate is formed from the reaction of ammonia and nitric acid, where the nitric acid is formed from emissions of nitrogen oxides.

- **Ammonium Sulfate:** Ammonium sulfate is form from the reaction of ammonia and sulfuric acid, where the sulfuric acid is formed primarily from emissions of sulfur oxide, with smaller amounts forming from direct emissions of sulfur.

- **Organic carbon:** Organic carbon (OC) are generated as primary organic aerosol, predominantly through the combustion of hydrocarbons. Key sources include cooking, industrial processes, mobile source exhaust, tire wear, and wood burning. Secondary organic aerosols are formed from the oxidation of motor vehicle hydrocarbons, wood burning, solvent use, and industrial processes.

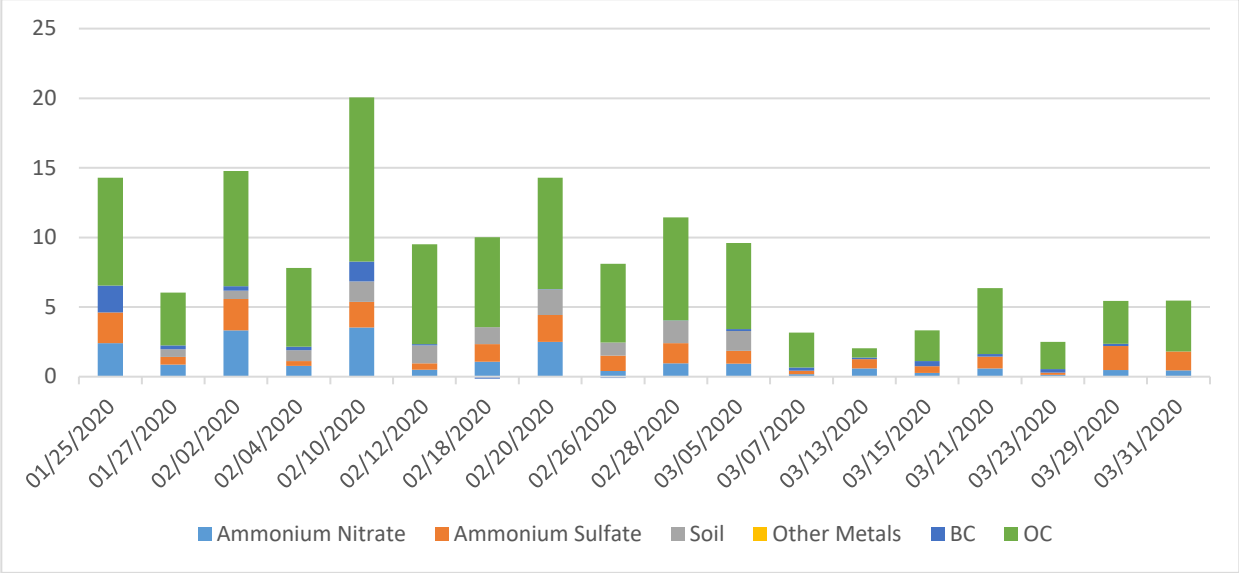
- **Black Carbon:** Black carbon is also known as soot or elemental carbon, and is formed during incomplete combustion in fuels, including mobile exhaust (mainly diesel) and wood burning.

- **Soil:** This category consists of road dust and soil dust that are entrained in the air from activity, such as soil disturbance or airflow from traffic.

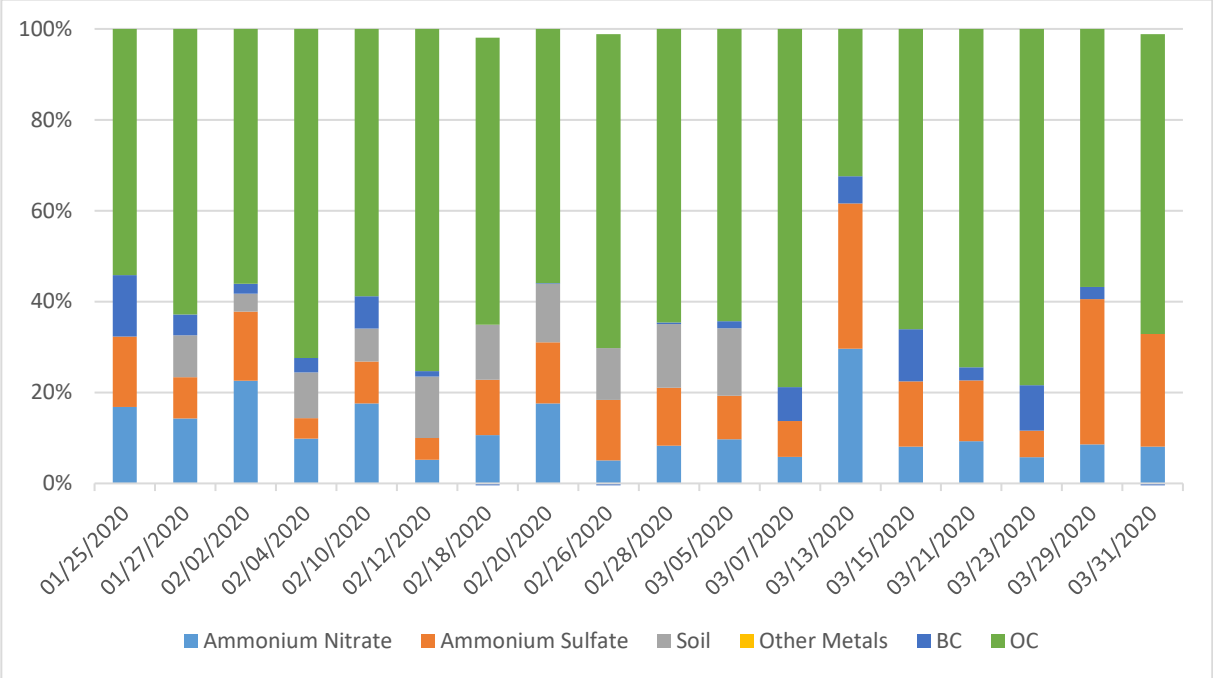
- **Other Metals:** Identified as components from soil emissions or found in other particulates having been emitted in connection with combustion from engine wear, brake wear, and similar processes. Certain metals are also emitted from the use of fireworks.

The following figures show the concentration levels and relative comparison of the various PM2.5 species sampled at the Shafter-DMV air monitoring site. Samples were taken over a 3 month period during the timeframe of this report, with no samples exceeding the 24-hour federal PM2.5 standard of 35 µg/m^3.

Speciated PM2.5 Concentrations at Shafter DMV Site (January 2020 – March 2020)



Relative Comparison of PM2.5 Species Measured at Shafter DMV Site (January 2020 – March 2020)



VI. Summary of VOC Speciation Analysis

To build a fuller understanding of the various compounds that contribute to VOC concentrations in the Shafter community, in December 2019 the District began operating VOC speciation sampling at the Shafter-DMV site near the intersection of Walker Street and Pacific Avenues. The collected samples were sent to a third party laboratory for analysis to determine the various specific VOCs that were detected in the atmosphere. This laboratory analysis is able to isolate the concentrations of nearly 70 different VOCs from each air sample collected in the field.

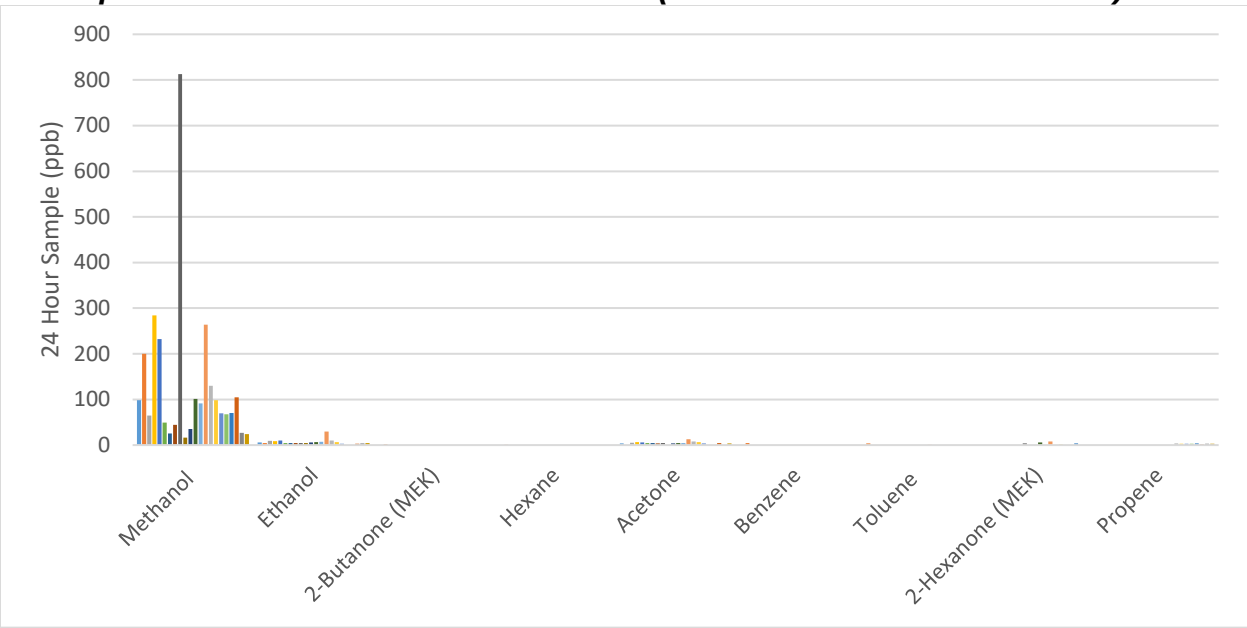
VOCs are carbon chained compounds that vaporize in ambient conditions. Among these compounds include but, are not limited to, BTEX, 1,3-butadiene, PAH, aldehydes, naphthalene, and diethanolamine. These compounds are typically emitted from products such as paints, inks, organic solvents, petroleum products as well as vehicle exhaust. The health effects of these compounds vary but, long term exposure can have lasting adverse health effects. A more detailed list of possible VOCs and their health effects is provided by the California Office of Environmental Health Hazard Assessment (OEHHA)[1].

During this period, the District collected 22 air samples for laboratory analysis. The VOC laboratory analysis is capable of isolating concentrations of 68 VOC species,

[1] https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary

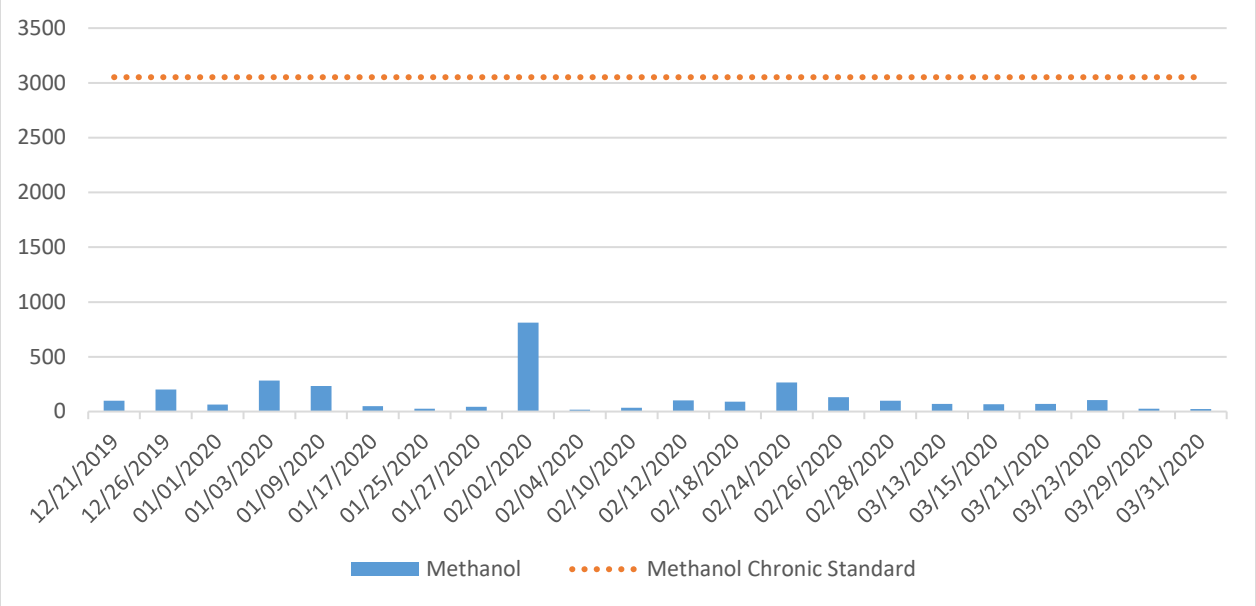
however during this period most VOCs were not detected in the atmosphere. The following chart displays the small number of VOCs that were detected during this period, with most of these reporting only trace levels.

VOC Species Detected at Shafter-DMV Site (December 2019 – March 2020)



During this period, methanol, ethanol, and acetone were the primary VOCs detected. Of these three, only methanol has an associated Reference Exposure Level (REL), a health risk metric established by the OEHHA. A comparison between the measured methanol concentrations and the associated REL is given in the following figure. Methanol is released to the environment during industrial uses and naturally from volcanic gases, vegetation, and microbes. It is released into ambient air from its evaporation during solvent uses or from automobile exhaust. The concentrations of methanol detected were well below the OEHHA REL chronic value, which is a more protective value than the acute REL. Overall, during the monitoring period no concerning concentrations of VOCs were detected in the samples taken.

24-Hr Methanol Concentrations



VII. Availability and Access to Community Air Monitoring Data

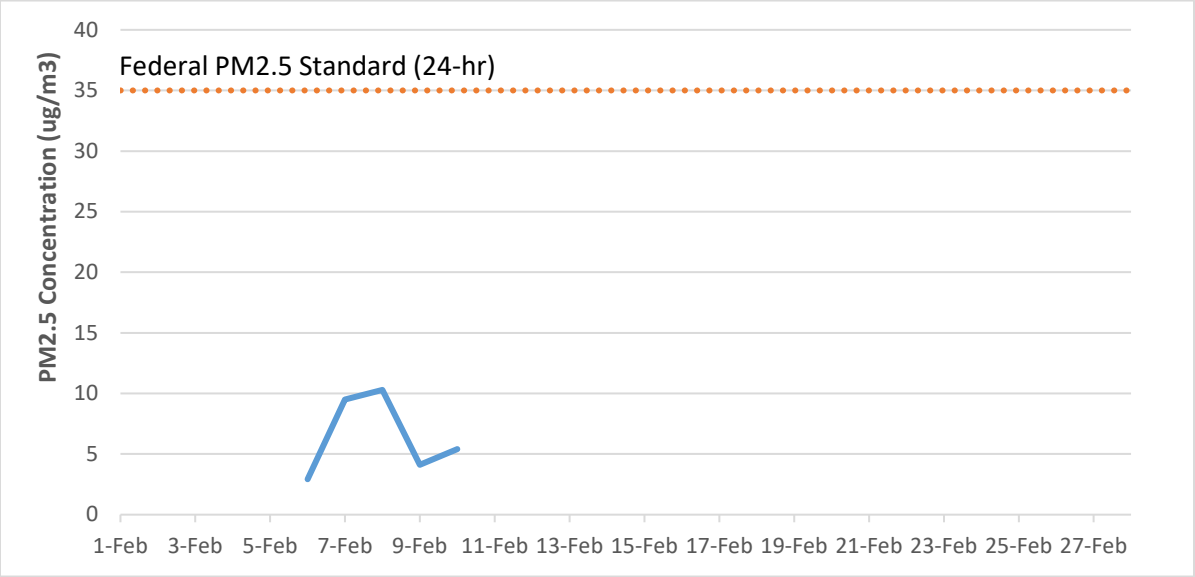
Specific air quality data collected within the Shafter community air monitoring network is available in real-time at the community air monitoring page located at http://community.valleyair.org/selected-communities/shafter/community-air-monitoring/. This District will also be posting to this page reports summarizing the laboratory speciation analysis conducted for PM2.5 and VOCs. This District will continue to develop and publish quarterly reports summarizing collected data to the District's AB 617 air monitoring website. Collected community air monitoring data is also available for download on the California Air Resources Board (CARB) AQview tool located at https://ww2.arb.ca.gov/es/community-air-quality-portal, where collected air monitoring data from all AB 617 communities is uploaded.

VIII. Next Steps

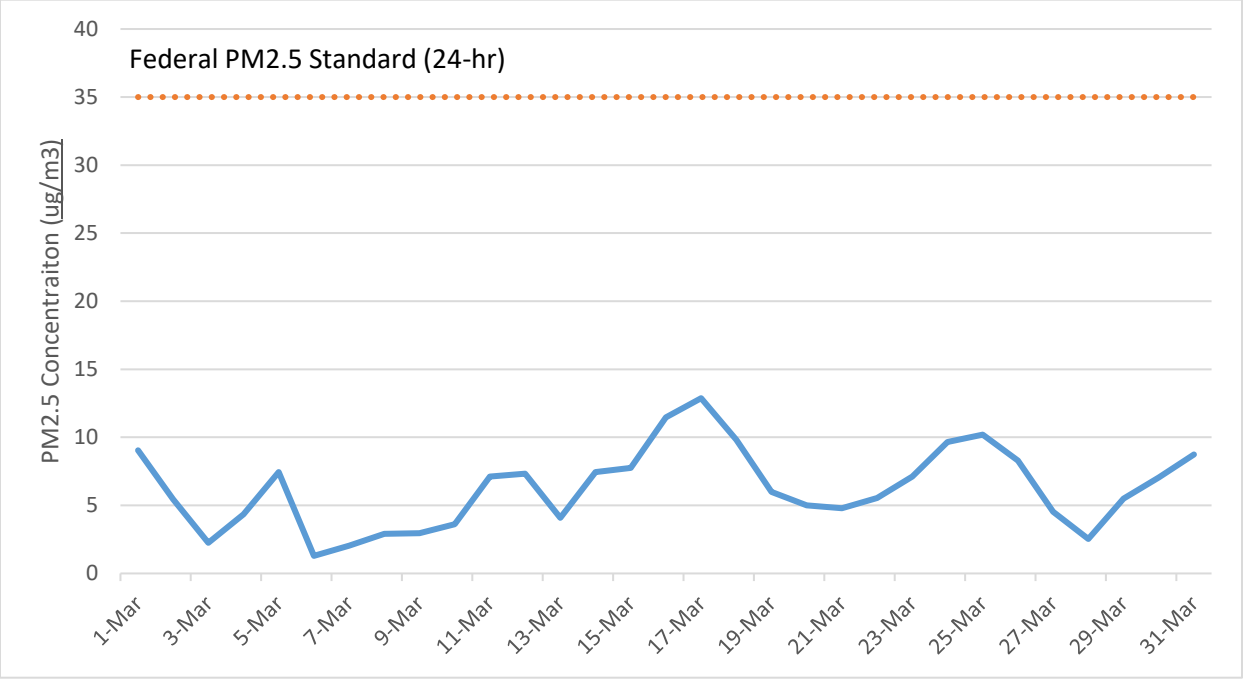
The District has deployed air monitoring equipment and obtained real-time PM2.5 measurements along with numerous sample collections for advanced third-party laboratory speciation analyses of PM2.5 and VOC for a large range of pollutants throughout the Shafter community. Emission concentrations measured throughout this period were predominantly below federal standards and OEHHA REL values. Moving forward, the District will continue these measurements and will continue to expand and establish the community air monitoring network in the community of Shafter.

IX. Appendix A: Daily PM2.5 Averages

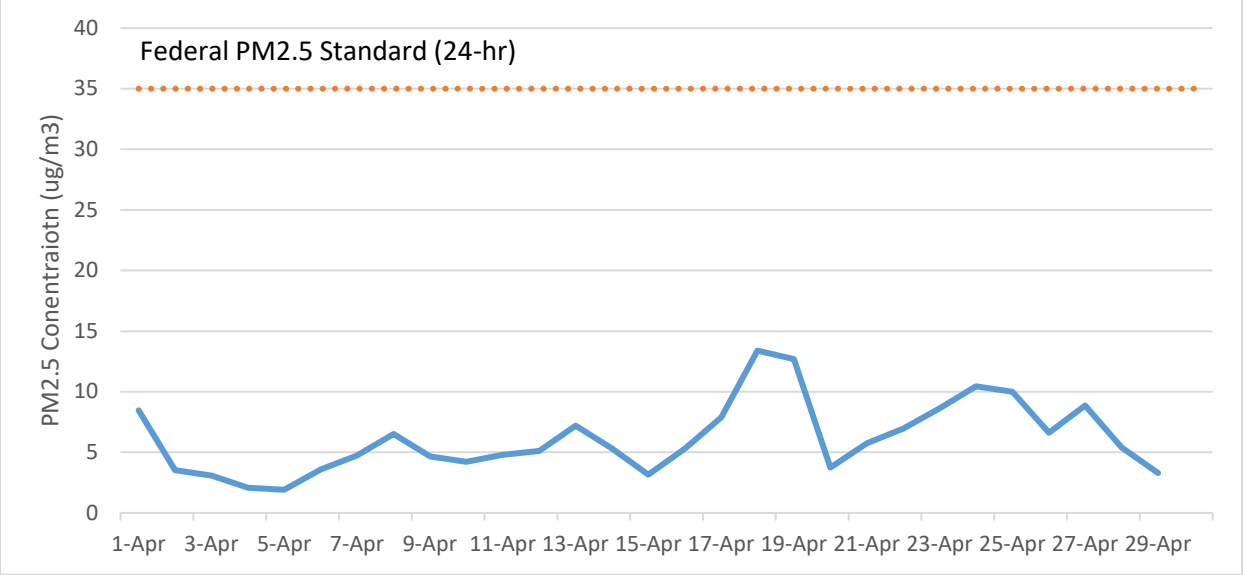
Shafter DMV – February 2019



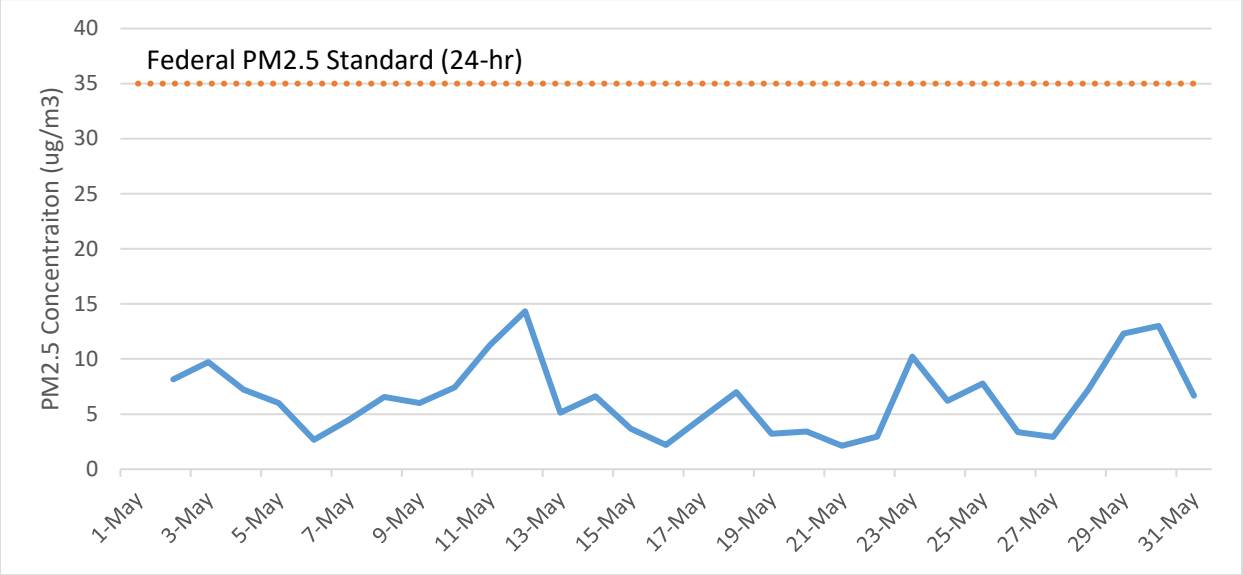
Shafter DMV - March 2019



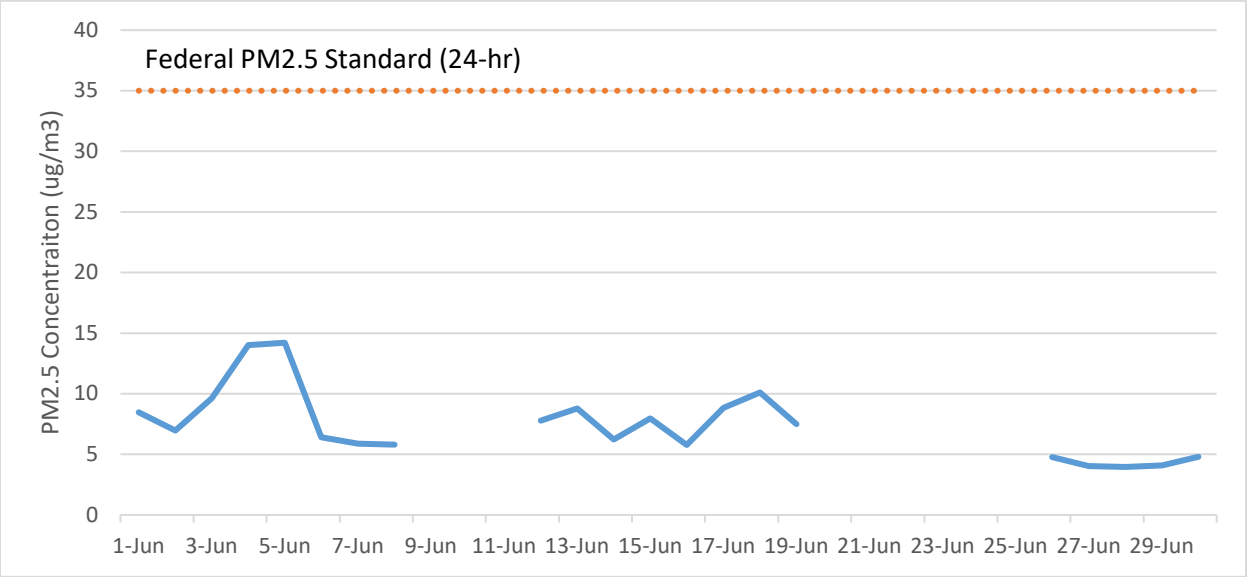
Shafter DMV - April 2019



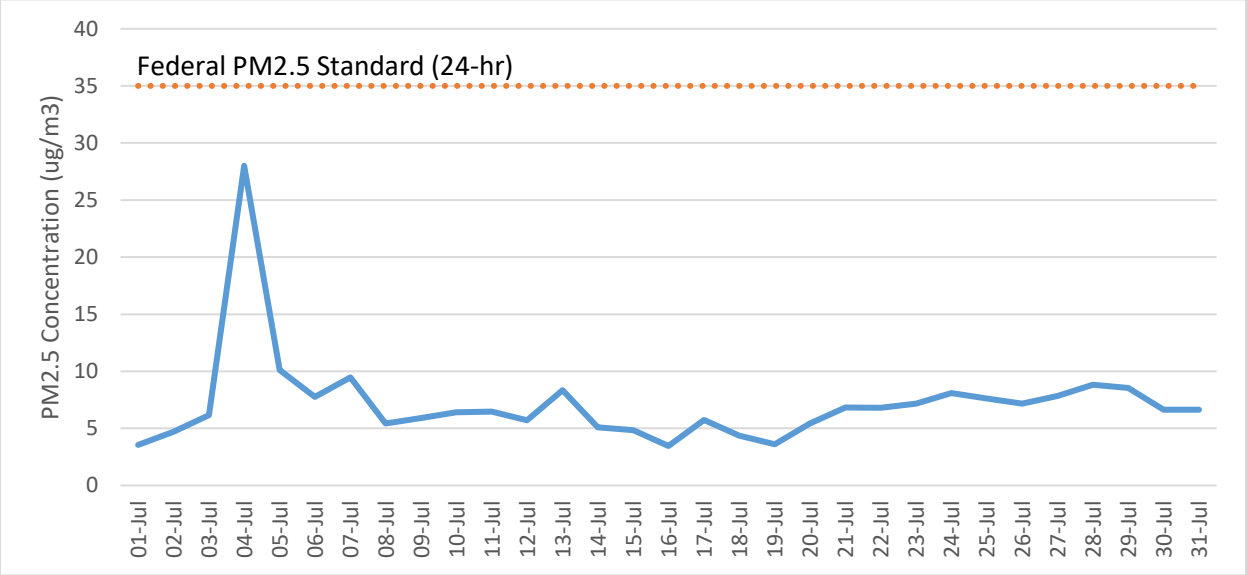
Shafter DMV – May 2019



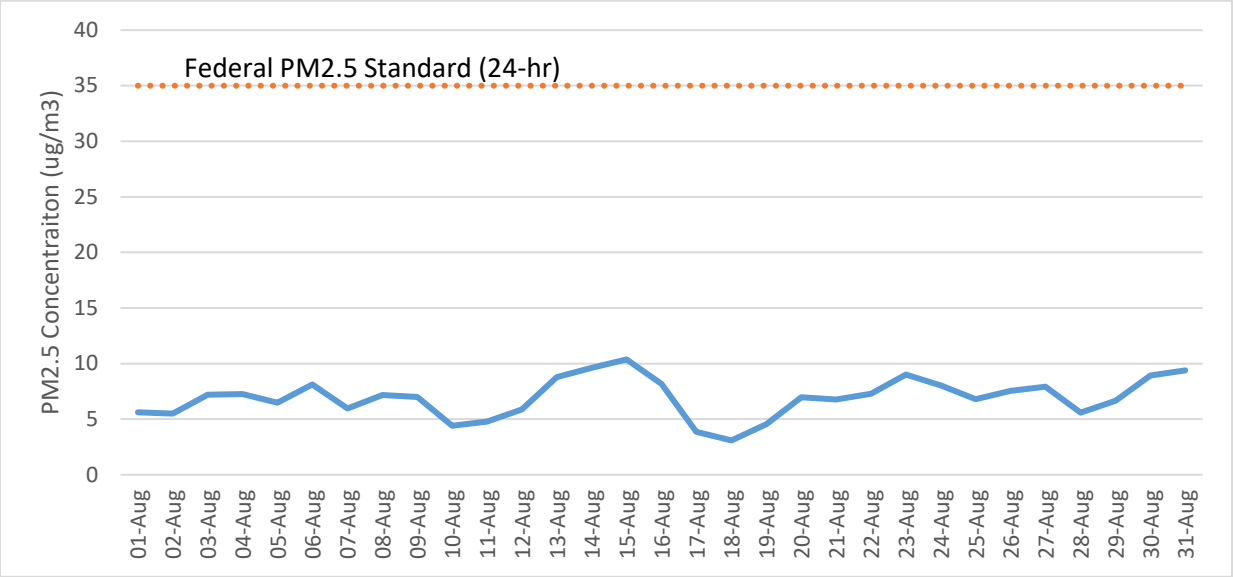
Shafter DMV – June 2019



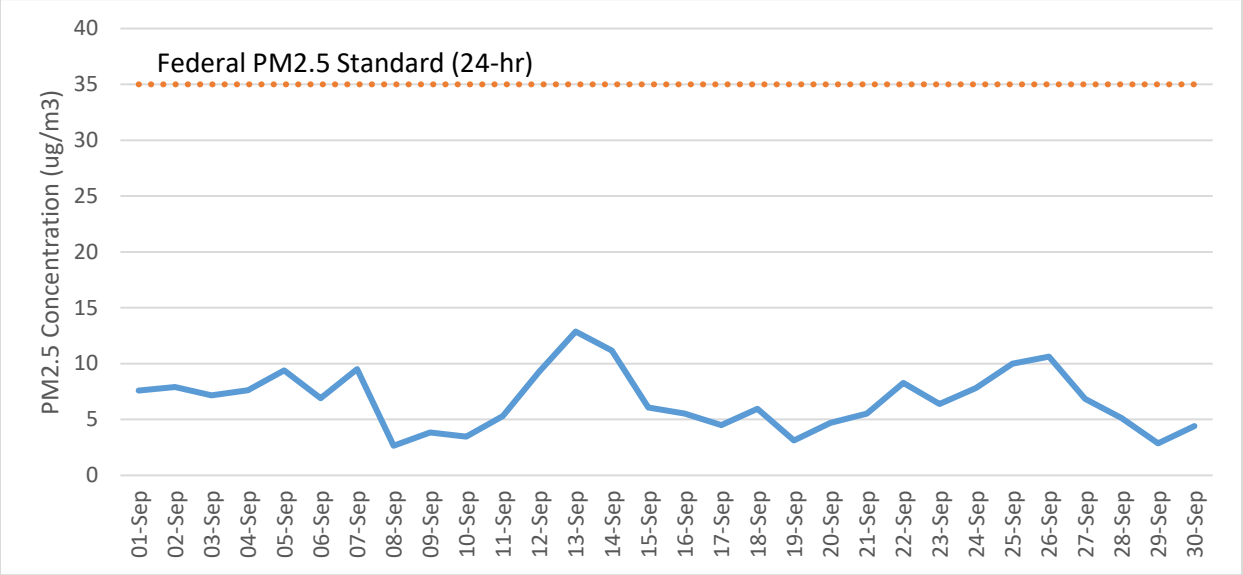
Shafter DMV – July 2019



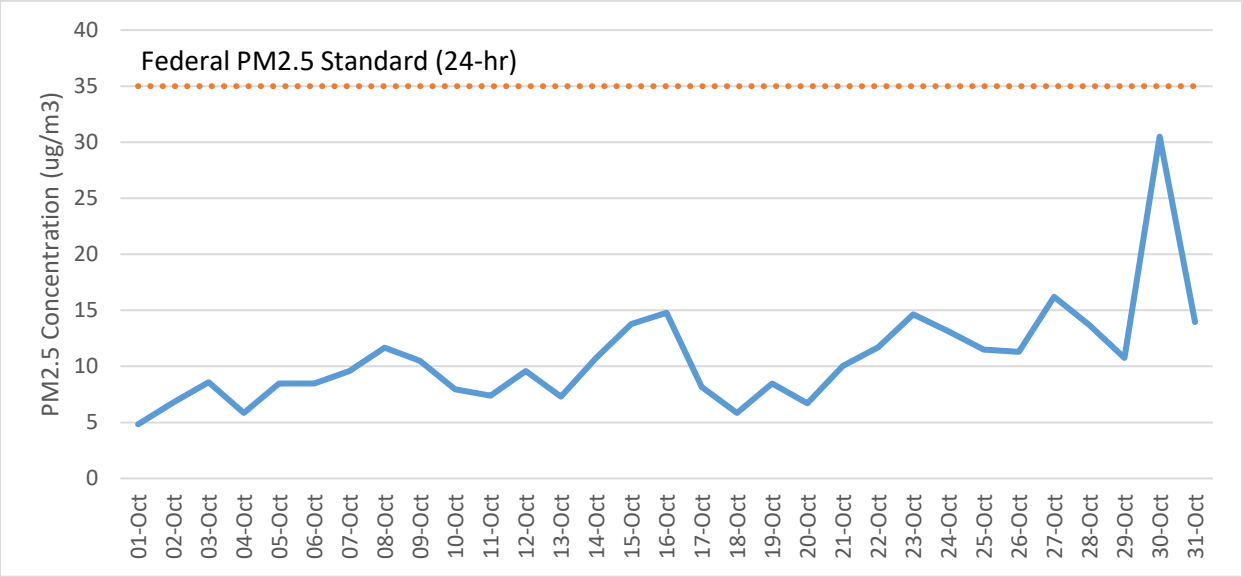
Shafter DMV – August 2019



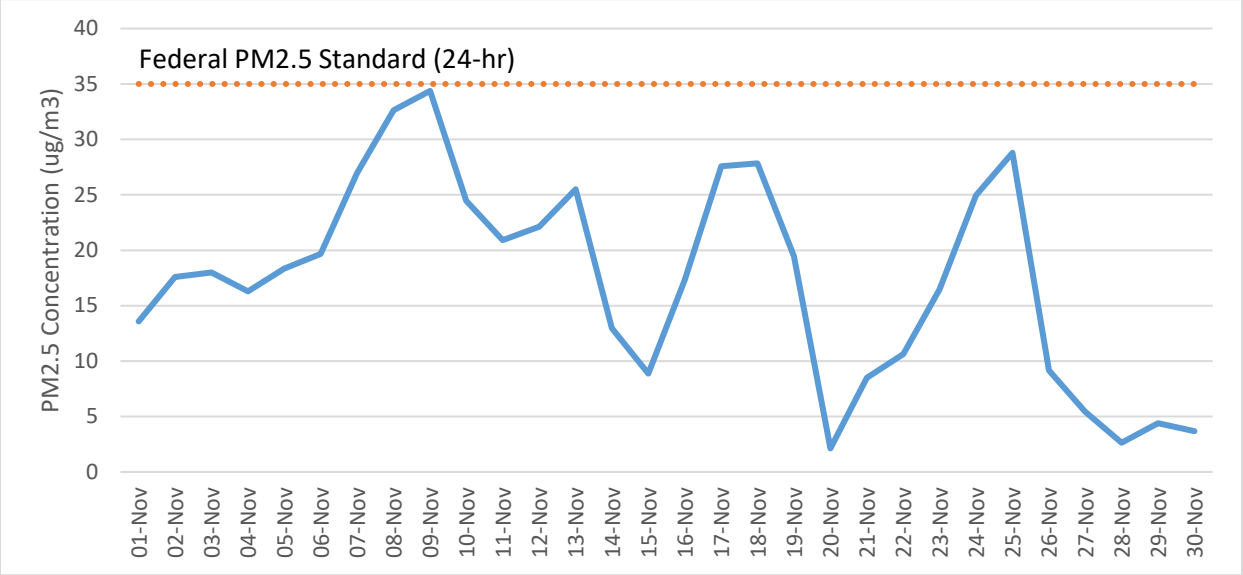
Shafter DMV – September 2019



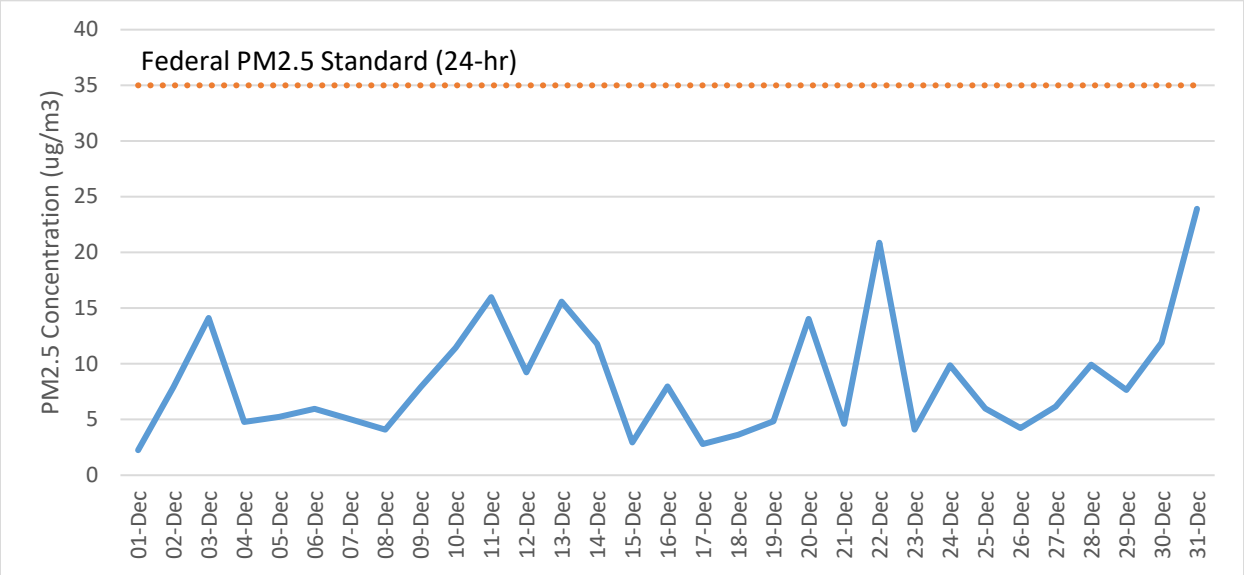
Shafter DMV – October 2019



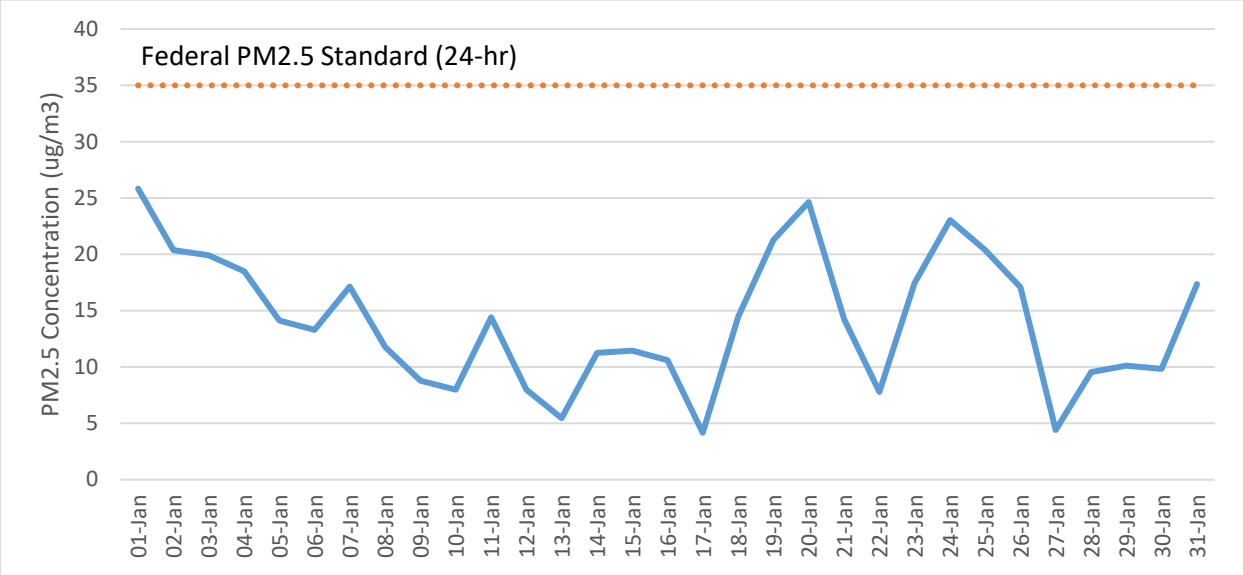
Shafter DMV – November 2019



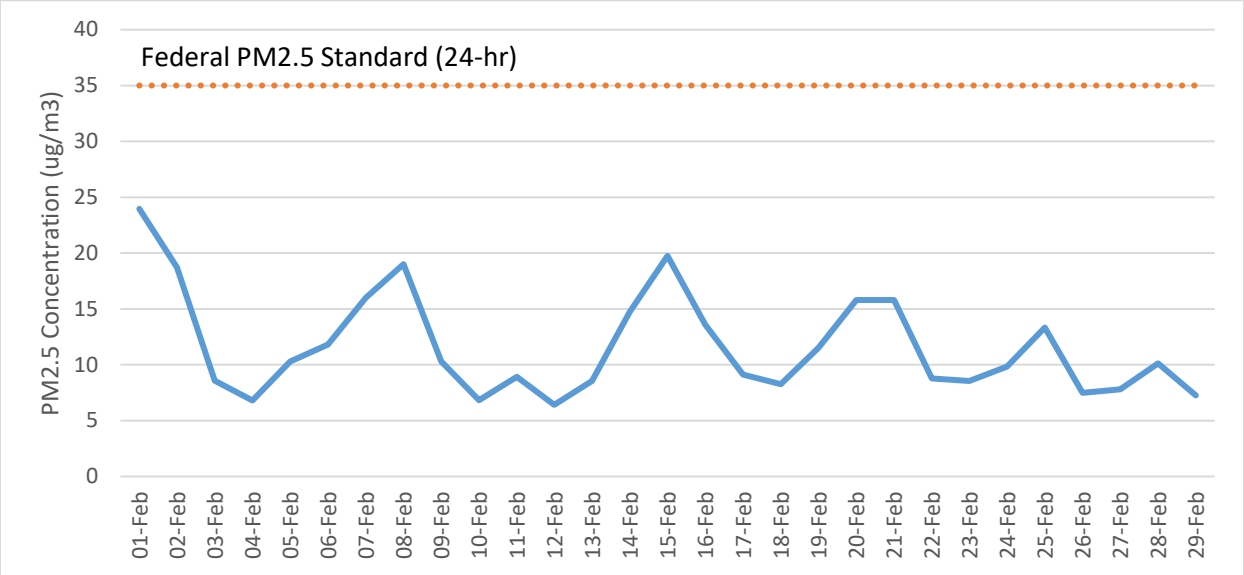
Shafter DMV – December 2019



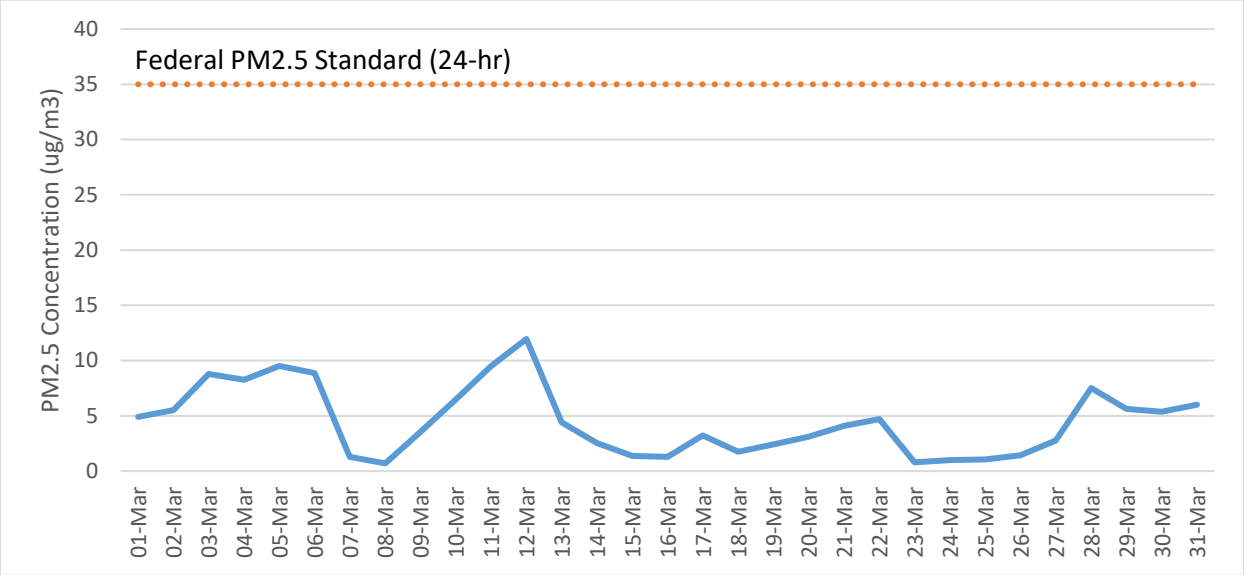
Shafter DMV – January 2020



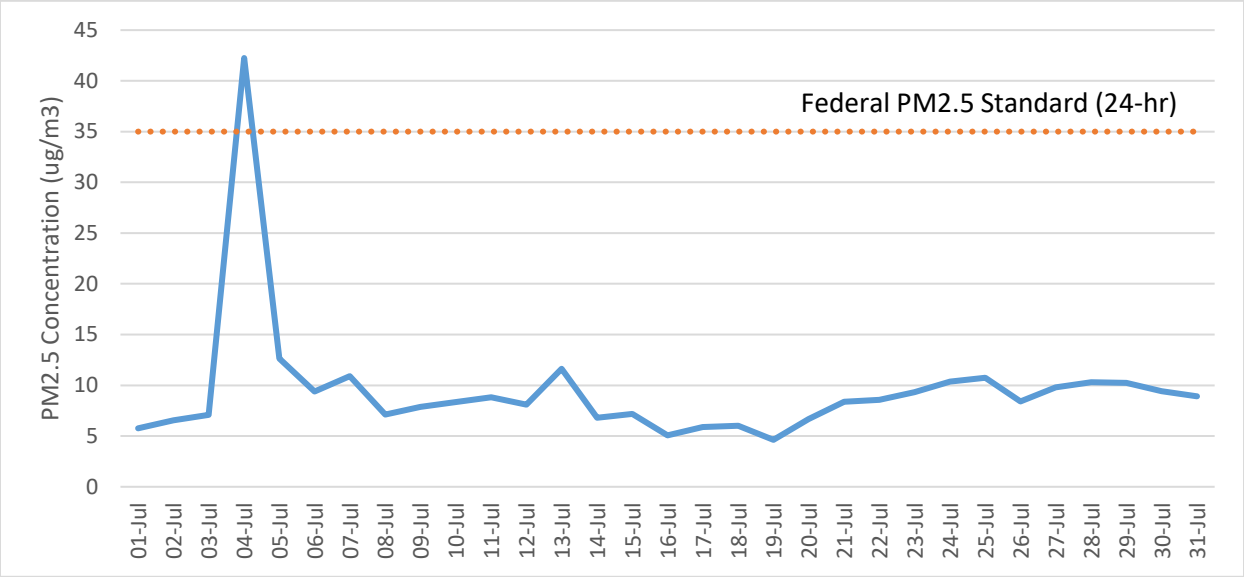
Shafter DMV – February 2020



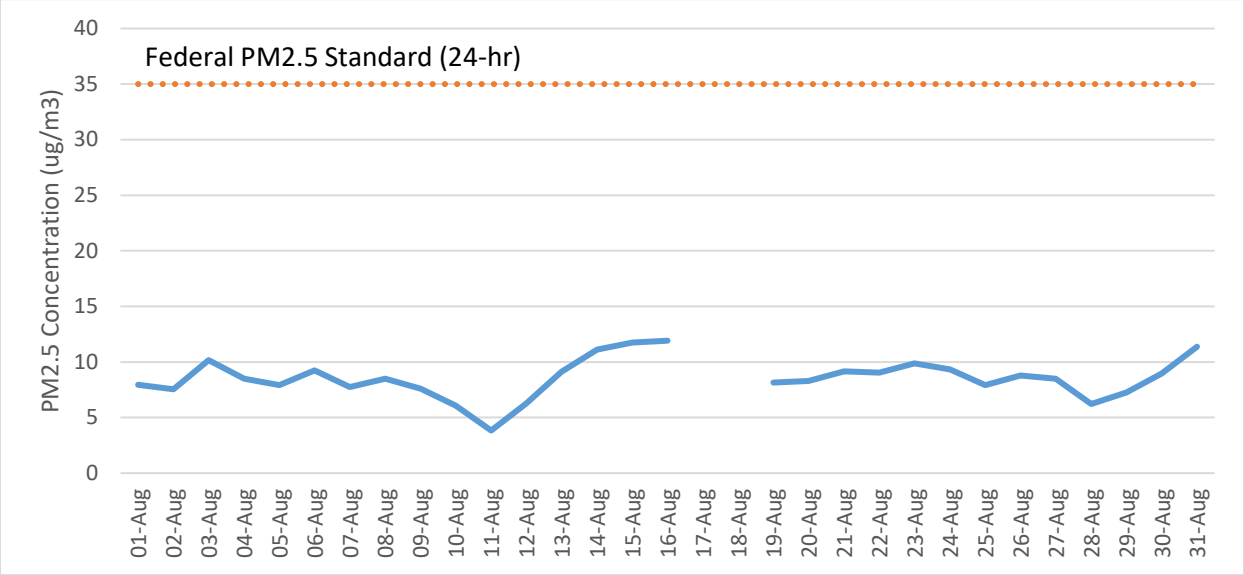
Shafter DMV – March 2020



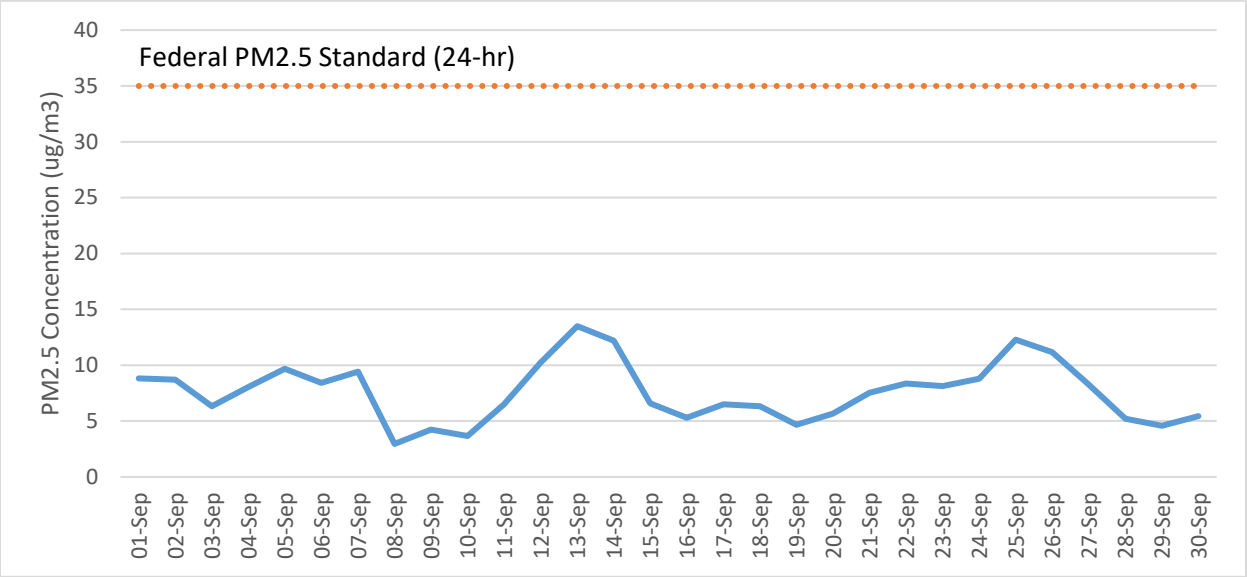
Grimmway Academy – July 2019



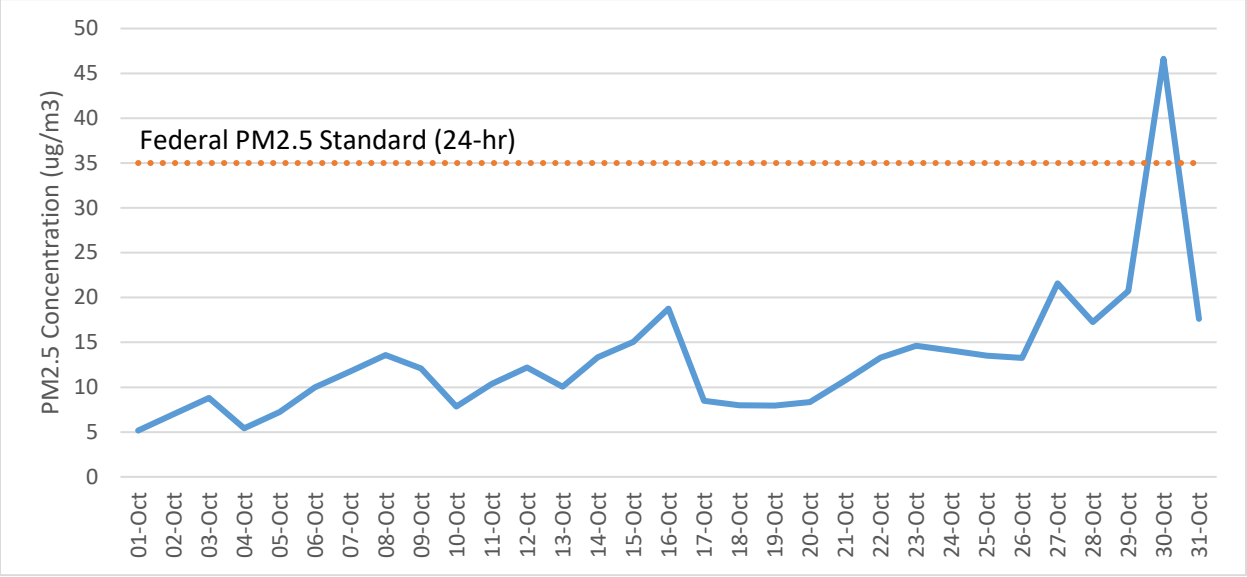
Grimmway Academy – August 2019



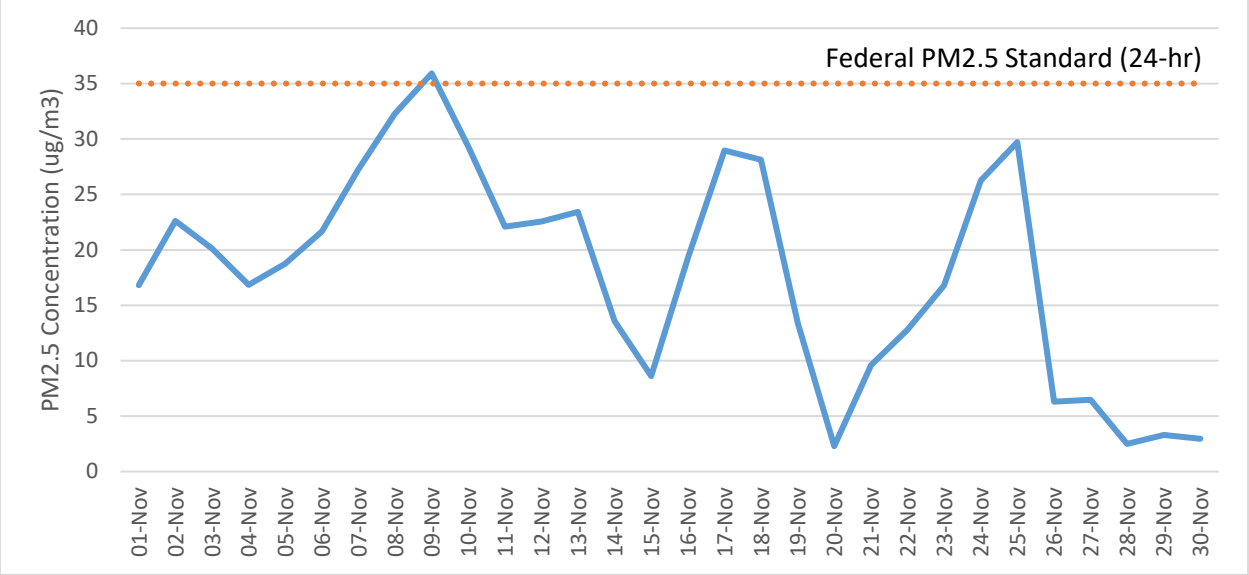
Grimmway Academy – September 2019



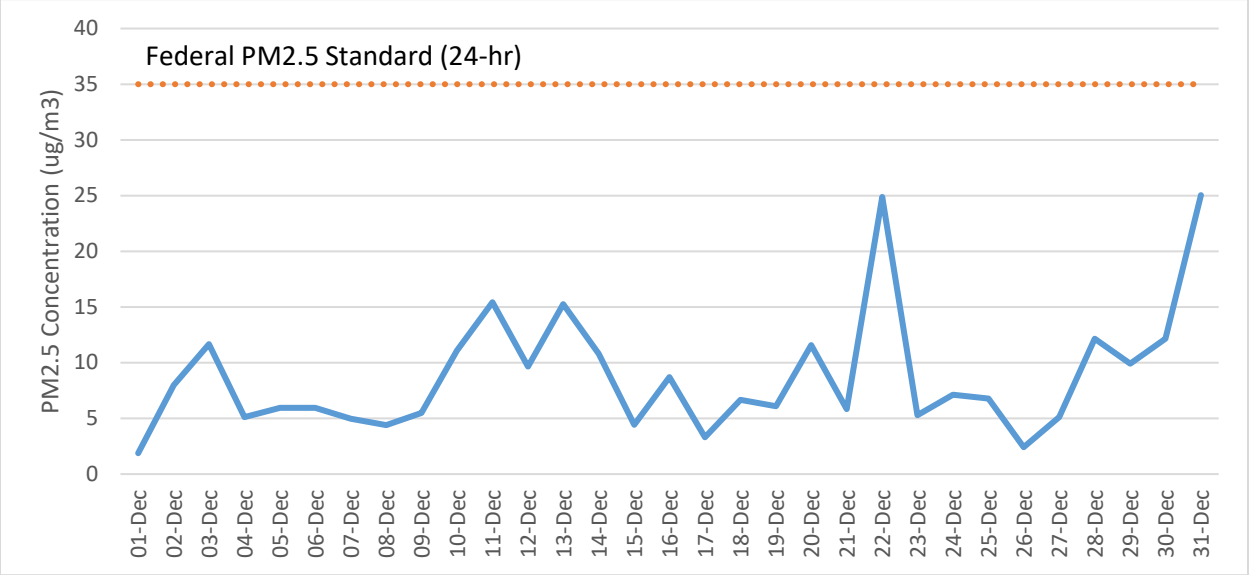
Grimmway Academy – October 2019



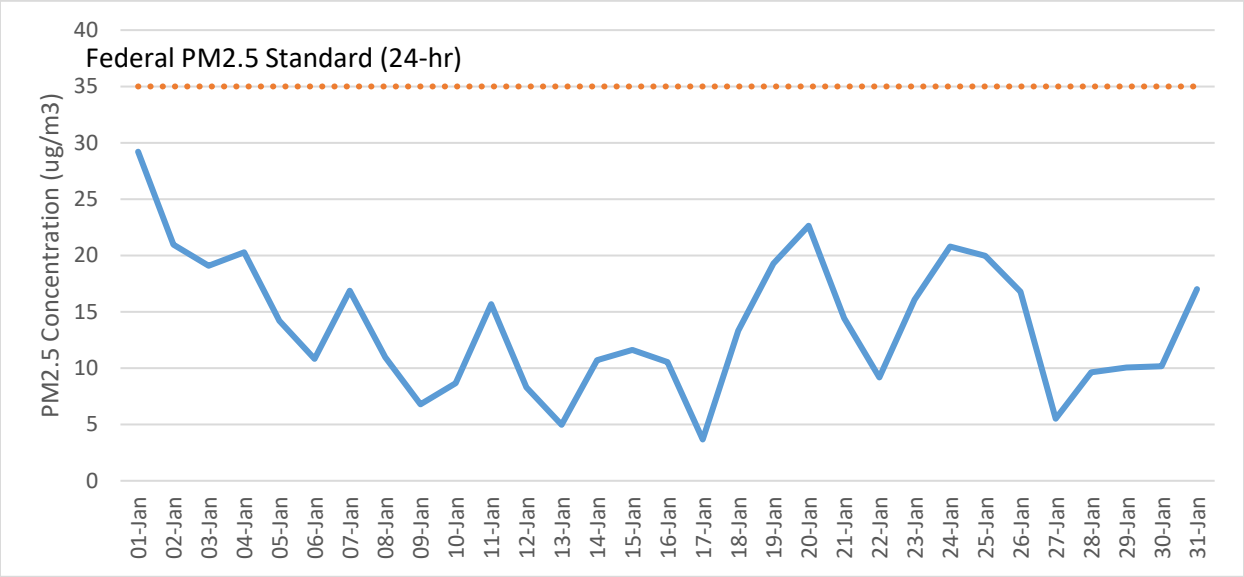
Grimmway Academy – November 2019



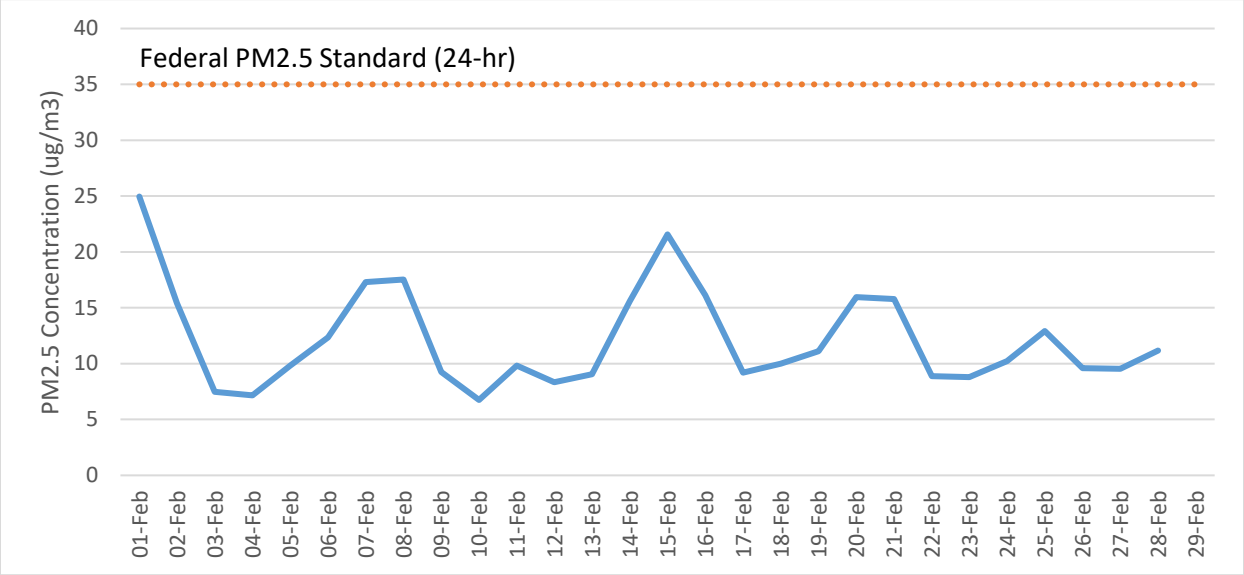
Grimmway Academy – December 2019



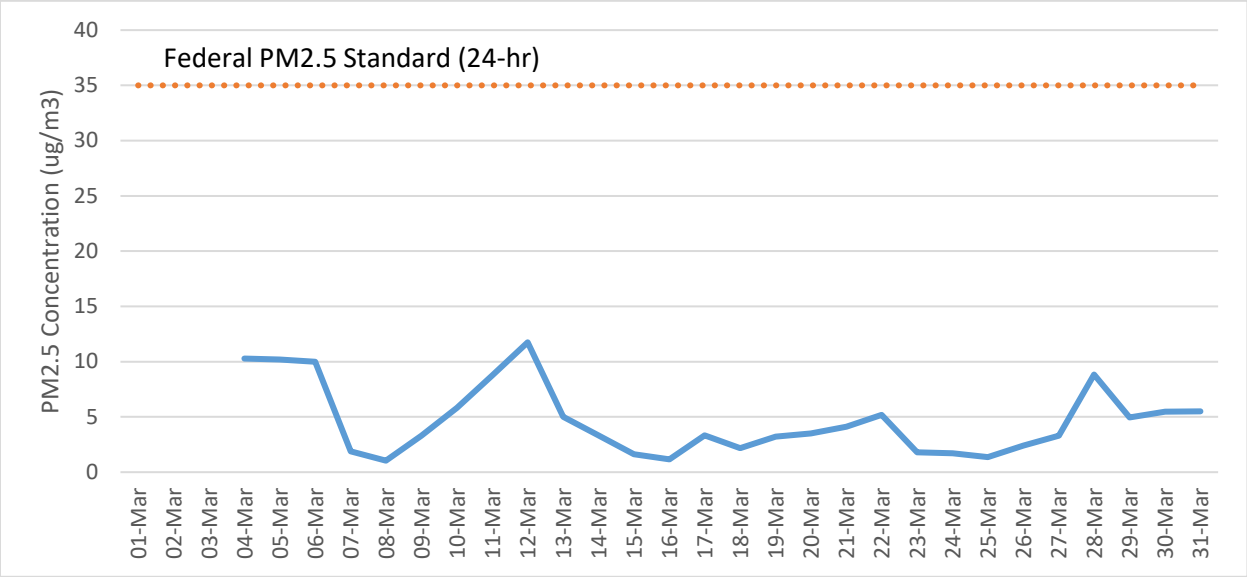
Grimmway Academy – January 2020



Grimmway Academy – February 2020

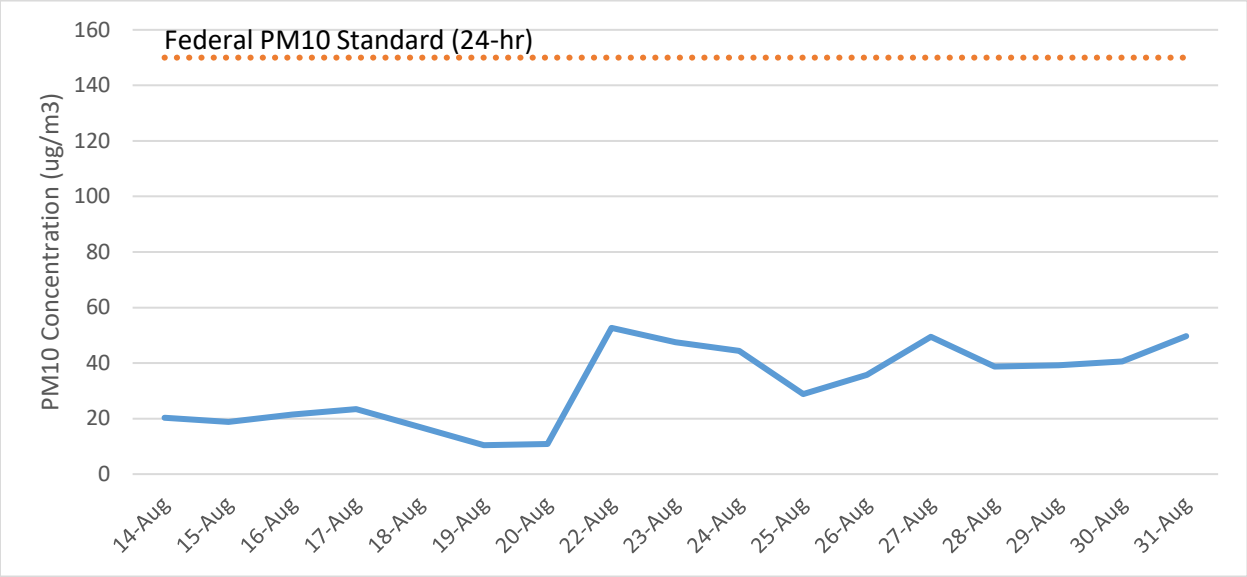


Grimmway Academy – March 2020

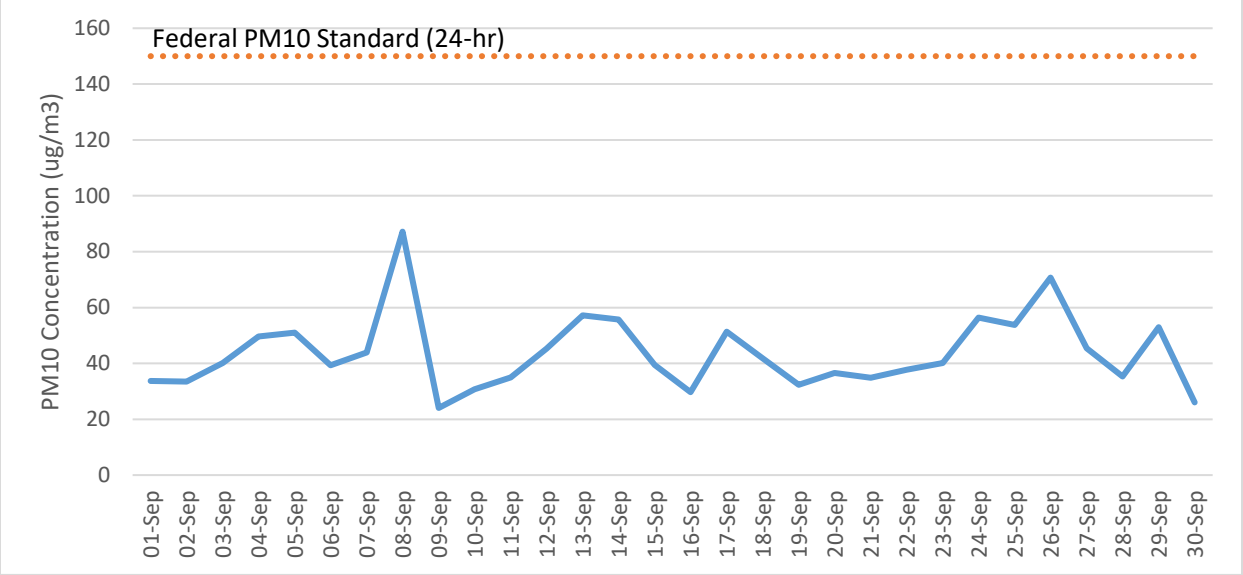


X. Appendix B: Daily PM10 Average

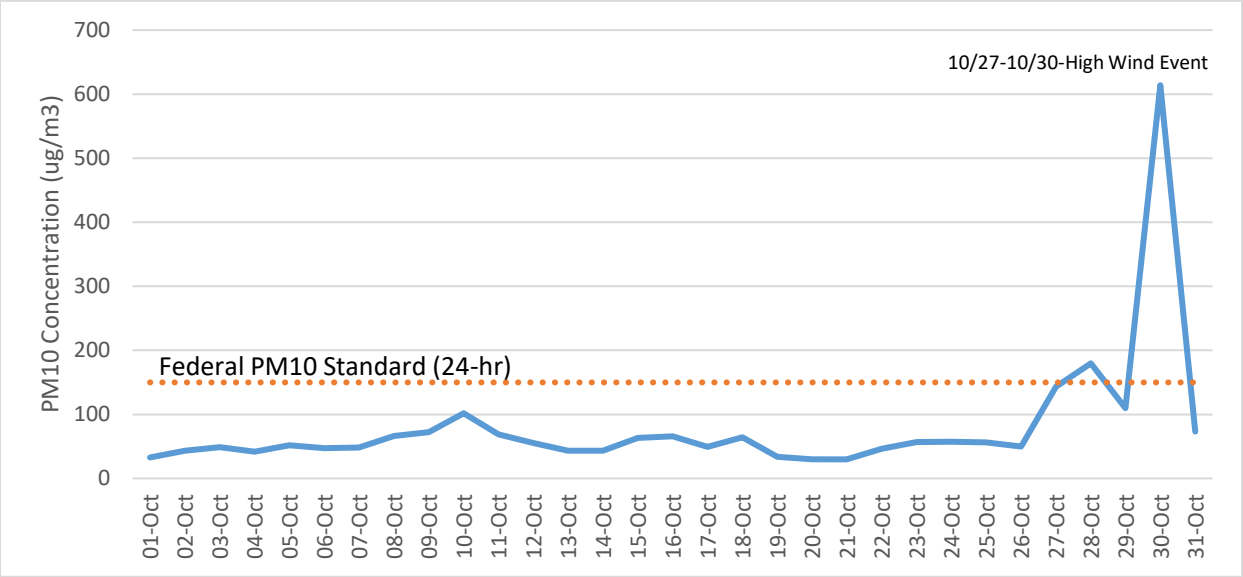
Shafter DMV – August 2019



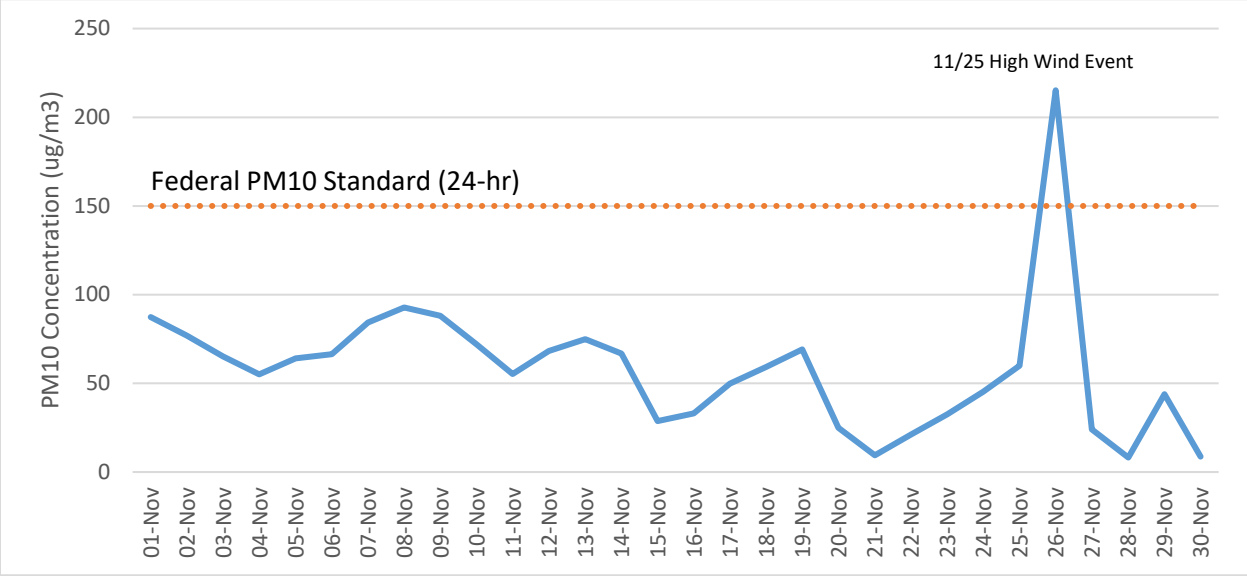
Shafter DMV – September 2019



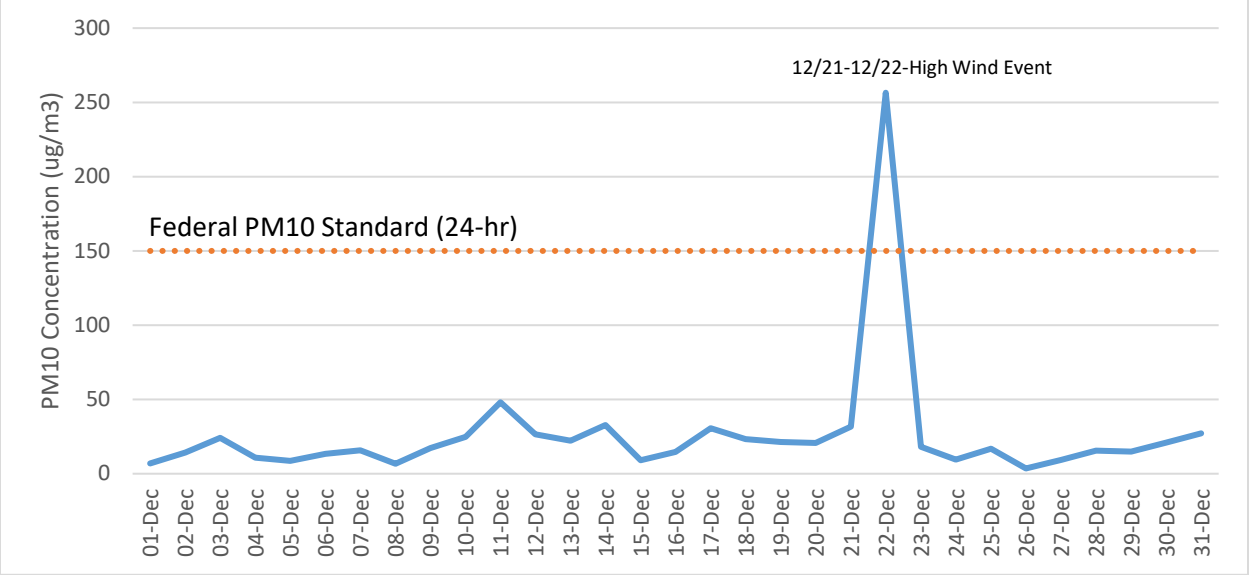
Shafter DMV – October 2019



Shafter DMV – November 2019



Shafter DMV – December 2019



XI. Appendix C: Summary of Data Collected using Mobile Air Monitoring Van

During the period of January 8 to January 29, 2020, the mobile air monitoring van was used to measure a variety of pollutants at the following locations within the Shafter community 7 mile radius.

Site A: North of Shafter in agriculture area.

Site B: West of Shafter located near dairy operations

Site C: East of Shafter located near the industrial/airport area near Highway 99 and Lerdo Highways

Site D: South of Shafter focusing on the Mexican Colony community

During the period of March 11 to March 31, 2020, the air monitoring van coverage was extended to areas that are still awaiting approval for installation of semi-mobile and fixed air monitoring equipment. During this period, the air monitoring van was kept in a stationary mode for multiple hours to capture a longer period of pollutant trends in the area. These areas include locations near Sequoia Elementary, Golden Oak Elementary, and the North Shafter Farm Labor Center.

Note that although BTEX compounds were being measured by the air monitoring van during this period, concentrations of these compounds were not high enough to be detected by the analyzer. The measured pollutant concentrations are detailed in the following tables. Note that CO concentrations are reported in parts per million, PM2.5 is reported in micrograms per cubic meter, while all other pollutants are reported in parts per billion.

January 8, 2020

Site	Time	O3	CO	NO2	SO2	H2S
A	10:53-11:27	12.5	0.21	-	0.5	0.0
B	12:26-12:59	17.2	0.18	-	0.4	0.0
C	-	-	-	-	-	-
D	14:20-14:55	23.7	0.16	-	0.4	0.0

January 14, 2020

Site	Time	O3	CO	NO2	SO2	H2S
A	11:29-12:07	27.4	0.21	5.9	1.3	0.0
B	12:26-13:00	29.4	0.17	5.2	1.5	0.8
C	-	-	-	-	-	-
D	14:10-14:46	34.9	0.12	0.0	1.4	0.3

January 24, 2020

Site	Time	O3	CO	NO2	SO2	H2S
A	10:47-11:22	3.0	0.3	27.8	1.6	2.2
B	11:40-12:20	8.8	0.2	16.6	1.4	5.1
C	9:51-10:29	1.5	0.3	29.6	1.9	4.1
D	13:20-14:00	9.8	0.1	28.7	1.5	3.0

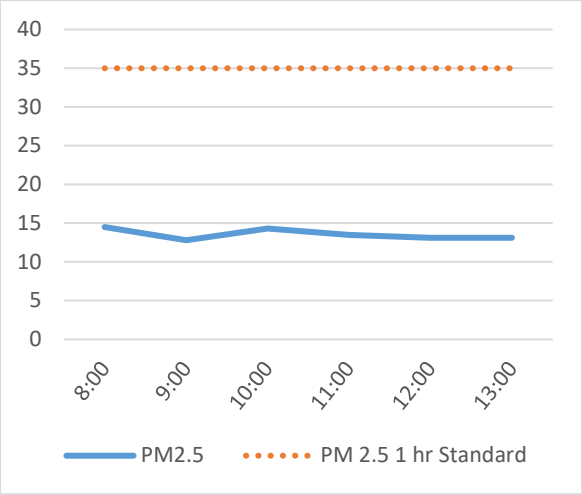
January 29, 2020

Site	Time	O3	CO	NO2	SO2	H2S
A	10:49-11:22	29.0	0.17	-	1.4	0.6
B	11:51-12:30	28.6	0.17	-	1.3	0.2
C	9:49-10:32	9.5	0.25	-	1.6	2.4
D	13:41-14:20	33.4	0.17	-	1.3	0.3

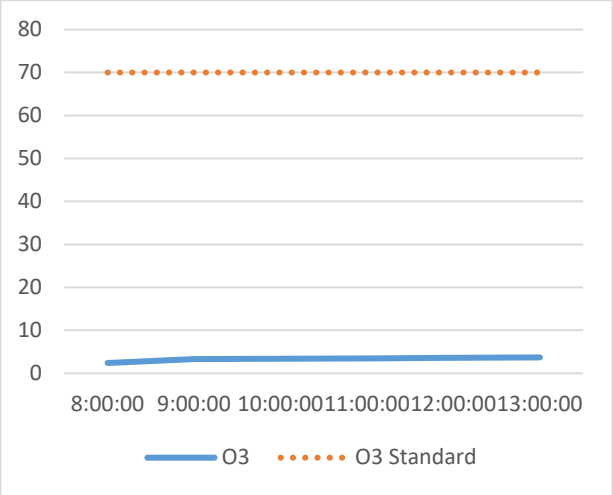
March 11, 2020 Golden Oak Elementary

Time	O3	CO	NO2	H2S	SO2	PM2.5
9:00	2.4	0.27	14.4	4.7	0.5	14.5
10:00	3.3	0.18	2.1	1.6	0.2	12.8
11:00	3.4	0.18	2.5	2.7	0.1	14.3
12:00	3.5	0.17	2.8	1.8	0.2	13.5
13:00	3.6	0.18	3.0	0.8	0.2	13.1
14:00	3.7	0.21	4.1	0.8	0.2	13.1

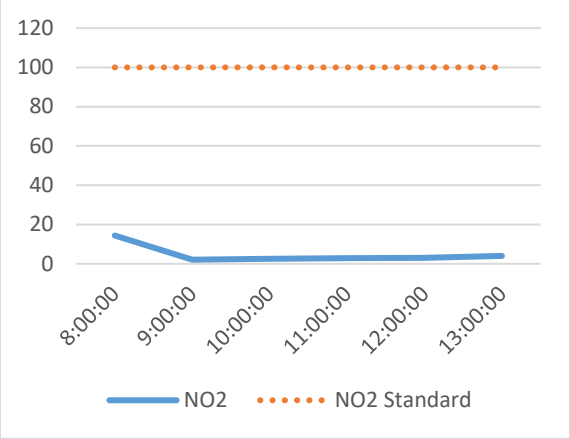
PM2.5



Ozone



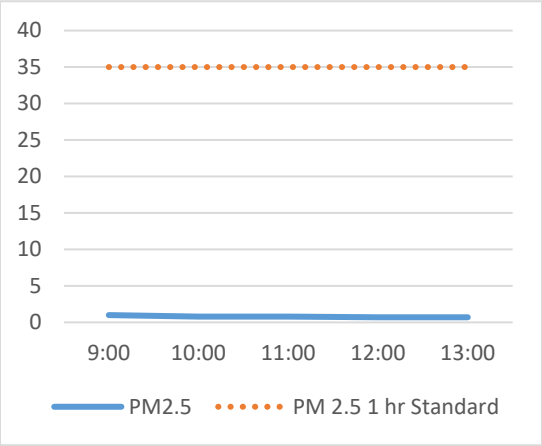
NO2



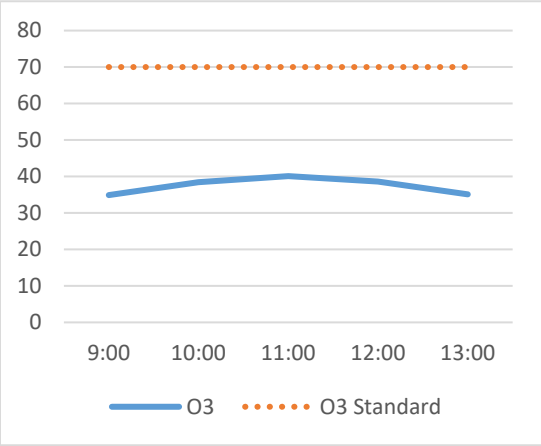
March 25 2020 Site D: Mexican Colony

Time	O3	CO	NO2	H2S	SO2	PM2.5
9:00	34.9	0.1	1.8	0	0.6	1.0
10:00	38.4	0.1	1.3	0	0.5	0.8
11:00	40.1	0.14	2.1	0	0.5	0.8
12:00	38.6	0.15	3.5	0	0.7	0.7
13:00	35.1	0.18	5.5	0	0.7	0.7

PM2.5



Ozone



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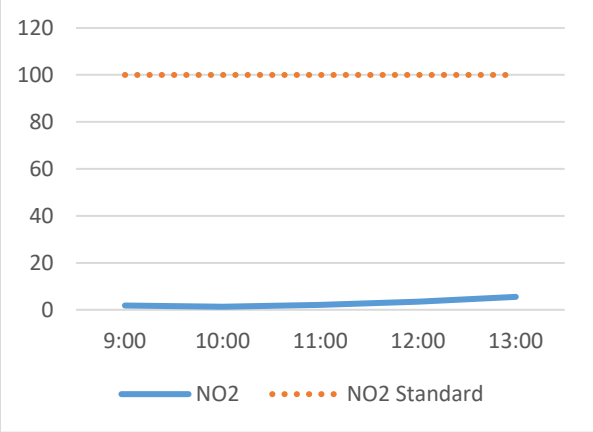
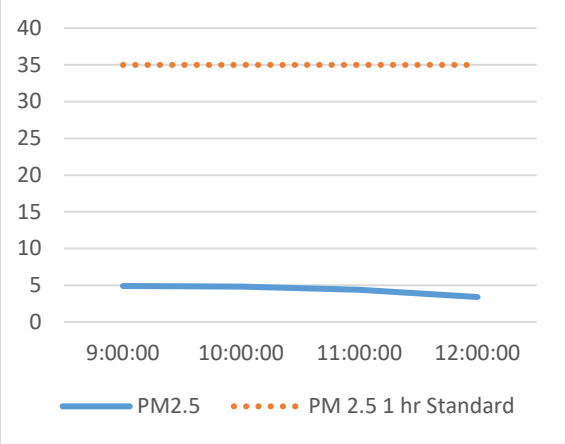


March 31, 2020 North Shafter Farm Labor Camp

Time	O3*	CO	NO2	H2S	SO2	PM2.5
9:00	-	0.16	0.3	0.8	0.2	4.9
10:00	-	0.16	0.6	0.6	0.3	4.8
11:00	-	0.16	0	0.4	0.3	4.4
12:00	-	0.17	3.4	0.2	0.2	3.4

*Ozone analyzer offline

PM2.5



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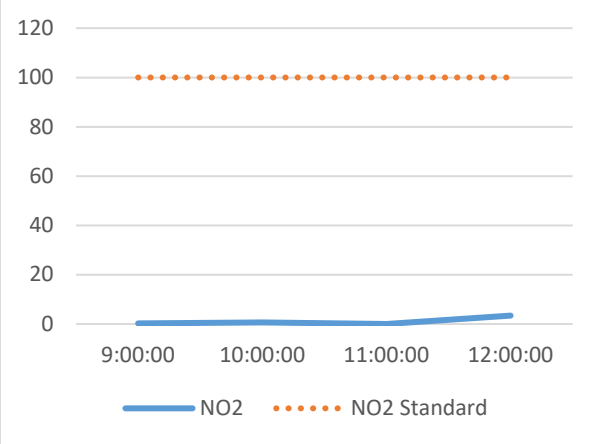
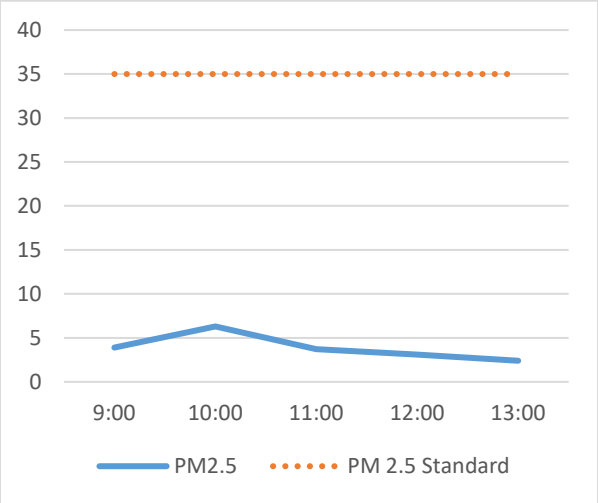


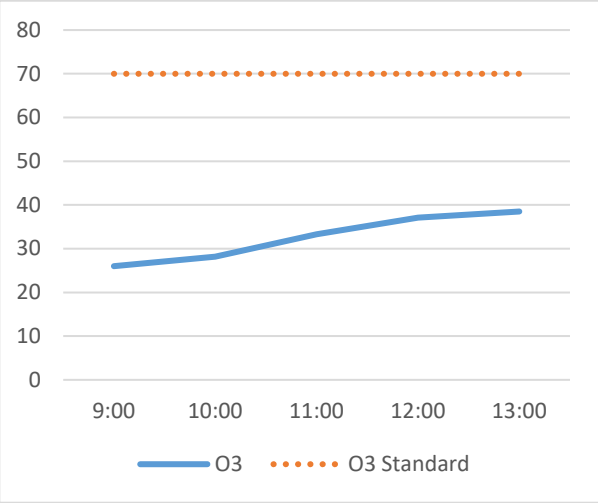
March 31, 2020 Site B: West of Shafter Near Dairy Operations

Time	O3	CO	NO2	H2S	SO2	PM2.5
9:00	26.0	0.14	2.1	1	0.6	3.9
10:00	28.2	0.13	1.9	0.6	0.6	6.3
11:00	33.3	0.14	1.7	0.3	0.7	3.7
12:00	37.1	0.15	3.6	0.3	0.7	3.1
13:00	38.5	0.17	3.7	0.2	0.7	2.4

PM2.5



Ozone



NO2