San Joaquin Valley Air Pollution Control District

2011 Air Monitoring Network Plan

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The District's Core Values and the District's Air Monitoring Network

* Protect Public Health *

The District uses data collected from the Valley air monitoring network to generate daily air quality forecasts and, when needed, issue health advisories. The District also uses data collected from the Valley's air monitoring network as the basis for long-term attainment strategies and to track progress towards health-based air quality standards.

* Active and effective air pollution control efforts with minimal disruption to the Valley's economic prosperity *

The District uses air monitoring data to help determine what kind of air pollution control efforts are needed to achieve health-based air quality standards.

* Outstanding Customer Service *
* Accountability to the public *

The District's website provides timely and easy public access to data from the Valley's real-time air monitors. The public can also access summaries of the previous seven days of air quality for ozone and particulate matter.

* Open and transparent public processes *

In addition to making air quality data available in real-time, the District uses air quality data in a variety of publicly available documents and reports. The District also conducts a public review period for annual monitoring network plans.

* Respect for the opinions and interest of all Valley residents *

The District has actively made daily air quality information available to Valley residents in a variety of formats, from the District website to the media, and even with air quality flags at schools. The District considers public interests in establishing new air monitoring stations.

* Ingenuity and innovation *

The District uses new and improved air monitoring techniques as these techniques are approved by the EPA. The District uses the latest science when siting air monitors. In turn, data collected from the monitoring network contributes to ongoing scientific evaluations.

* Continuous improvement *

The District evaluates the air monitoring network in the annual Monitoring Network plan for opportunities for better data collection and greater efficiency. Furthermore, improved air monitoring is a continuous effort; throughout the year, the District seeks out opportunities to improve the air monitoring network.

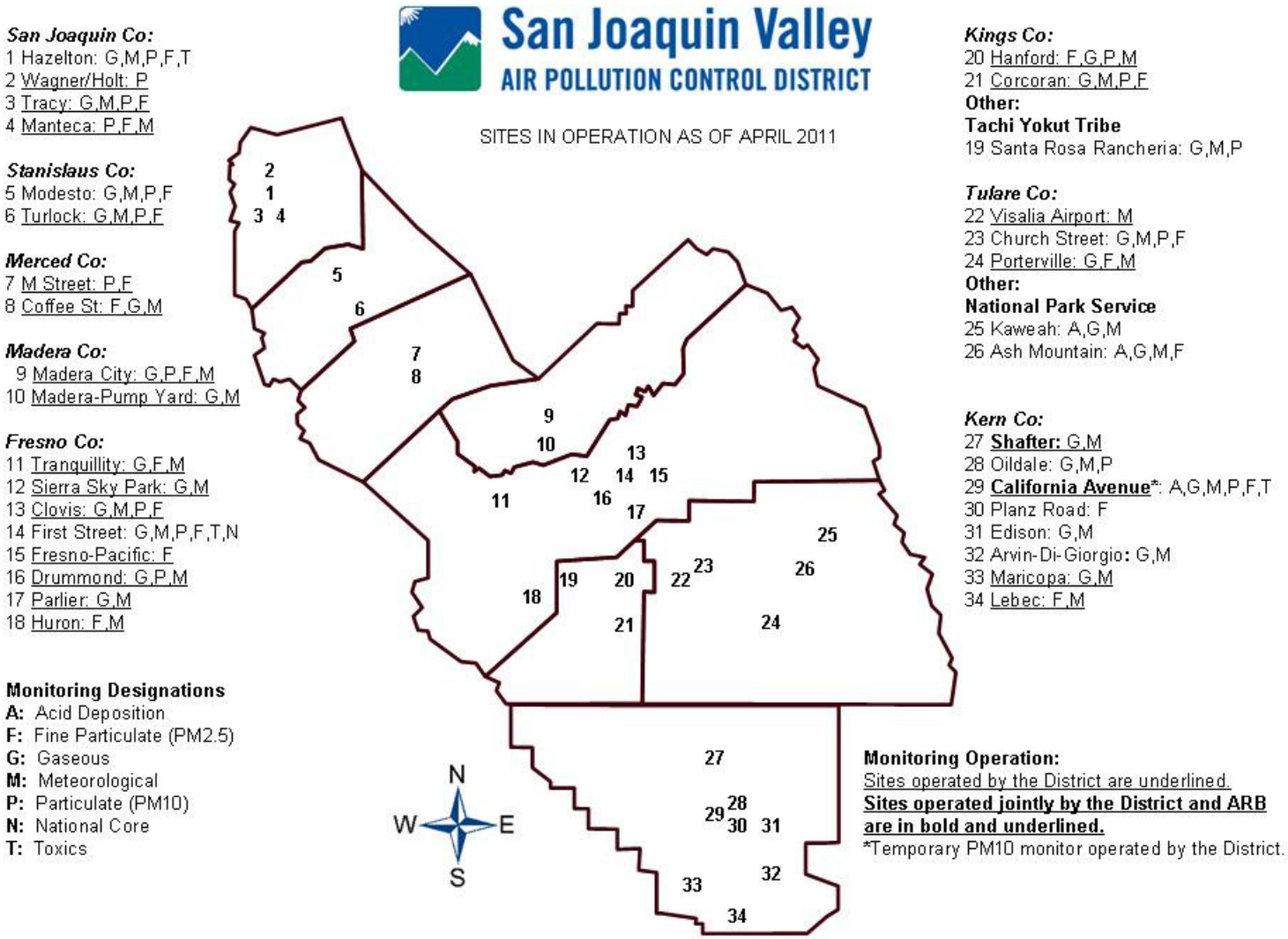
* Recognition of the uniqueness of the San Joaquin Valley *

The San Joaquin Valley is an expansive and diverse area. The District sites air monitors to represent each type of area and each portion of the region.

* Effective and efficient use of public funds *

An air monitoring network requires personnel, instruments, parts, energy, and leases. The District makes the most of limited resources by structuring the air monitoring network in a way that optimizes personnel time and funding for instruments. The result is a robust air monitoring network that helps the Valley reach its air quality goals without unnecessary expenditures.

Figure 1 Map of Air Monitoring Sites in the San Joaquin Valley



Executive Summary

The San Joaquin Valley Air Pollution Control District (SJVAPCD or District) operates an extensive network of air quality monitors throughout the San Joaquin Valley (Valley) to support its mission of improving and protecting public health. On a short term scale, District staff use the hourly readings from real-time monitors daily to generate an Air Quality Index (AQI) for each of the Valley's eight counties. The AQI is displayed on the District website, in Valley media and the Real-time Air Advisory Network (RAAN), and as school air quality flags to communicate the current state of air quality to Valley residents so they can keep air quality in mind as they plan their activities. The District also uses real-time air quality data to manage prescribed burning, agricultural burning, and residential wood combustion to ensure these activities do not make air quality unhealthy.

The Valley's attainment status for the U.S. Environmental Protection Agency's (EPA) health-based air quality standards, the foundation of the District's air quality attainment plans (such as the *2007 Ozone Plan*, the *2008 PM2.5 Plan*, and upcoming plans), and the studies that contribute to these plans are determined by the monitoring data that is collected. As part of the District's long-term efforts to improve public health, air monitors collect data that is rigorously analyzed by laboratory technicians and District staff. This data is fundamental in the Valley's effort to achieve improved air quality and attainment of EPA's health-based standards as quickly as possible.

The San Joaquin Valley covers an area of 23,490 square miles, and the area is home to one of the most challenging air quality problems in the nation. The Valley is nonattainment for federal PM2.5 and ozone standards, is in attainment of the federal standards for lead, Nitrogen dioxide, Sulfur dioxide, and Carbon monoxide. In addition, the Valley is an attainment/maintenance area for PM10. The Valley is home to approximately 4 million residents, and includes several major metropolitan areas, vast expanses of agricultural land, industrial sources, highways, and schools. This expansive and diverse area comprises many air quality needs, yet there are limited financial and personnel resources for air quality monitoring.

Despite these limitations and challenges, the District maintains a robust air monitoring program. The District follows federal monitoring requirements and guidelines to ensure an efficient and effective monitoring network. This monitoring network plan describes the District's approach for implementing federal air monitoring and quality control requirements and summarizes recent and upcoming changes to the monitoring network. As specified in 40 CFR 58.10(a), this plan is made available for public inspection at least 30 days prior to submission to EPA.

Introduction: Air Monitoring Network Plan requirements

Annual monitoring network plans review a region's existing and proposed monitoring network in compliance with 40 CFR (Code of Federal Regulations) 58.10 as well as requirements linked to the District's EPA 105 Grant. The annual monitoring network plans are updated and submitted to the EPA Regional Administrator each year, and each plan must be made available for public inspection for at least 30 days prior to submission to EPA. The plans are to provide for the establishment and maintenance of an air monitoring network that may include the following types of stations and equipment:

Abbreviation	Full Name	Description
ARM	Approved Regional Method	A method that has been approved within a specific region for comparison to federal air quality standards. *There are no ARM monitors in the San Joaquin Valley.*
FEM	Federal Equivalent Method	These monitors are considered to be equivalent to FRM monitors for the purpose of determining compliance with EPA's health-based air quality standards.
FRM	Federal Reference Method	EPA defines how these monitors are to work, how they are to be engineered, and how they are to measure pollutants. These monitors are used to determine compliance with EPA's health-based air quality standards.
NCore	National Core	Multipollutant monitoring stations; in California, these are operated by the California Air Resources Board (CARB)
PAMS	Photochemical Assessment Monitoring Station	VOC (volatile organic compounds) speciation sites used in serious, severe, or extreme ozone nonattainment areas for precursor evaluation.
SLAMS	State and Local Air Monitoring Station	Monitoring sites that are used for determinations of compliance with federal air quality standards, though they may be used for other purposes as well
SPM	Special Purpose Monitor	Not included when showing compliance with the minimum air monitoring requirements; an example might include a temporary monitoring station set up in an area to measure short term air quality impacts of a source. Data collected from an SPM can be used for Regulatory purposes if the monitor has been operational for two years and if the monitor is an ARM, FEM, or FRM.
STN	Speciated Trends Network	PM2.5 speciation stations that provide chemical speciation data of PM

The monitoring network plan should include a statement of purpose for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of 40 CFR part 58. The plan must contain the following information for each existing and proposed site (40 CFR 58.10 (b)):

- The MSA, CBSA, CSA, or other area represented by the monitor. MSA, CBSA, and CSA are statistical-based definitions for metropolitan areas provided by the Office of Management and Budget and the Census Bureau (see Table 1):
  - MSA: Metropolitan statistical area
  - CBSA: Core-based statistical area
  - CSA: Combined statistical area
- Air quality system (AQS) AIRS Code site identification number (see Table 2)
- Locations: street address and geographical coordinates
- Sampling and analysis methods for each measured parameter
- Operating schedules for each monitor
- Monitoring objective and spatial scale of representativeness for each monitor (as defined in Appendix D to 40 CFR 58)
- Any proposals to remove or move a monitoring station within 18 months of a plan submittal. Any proposed additions and discontinuations of SLAMS monitors are subject to approval according to 40 CFR 58.14
- Each air monitor is sited to satisfy at least one of three specific criteria:
  - Population (see Table 3)
  - Generally consistent pollution concentrations
  - A specific geographic scale

Table 1 SJV Areas of Representation

Title	***Code***
Combined Statistical Area (CSA)	**CSA Code**
Fresno-Madera CSA	260
Metropolitan Statistical Area (MSA)	**Core-based Statistical Area (CSBA) Code**
Bakersfield [1]	12540
Fresno	23420
Hanford-Corcoran	25260
Madera	31460
Merced	32900
Modesto	33700
Stockton	44700
Visalia - Porterville	47300

SJV Areas of Representation

Title	*Code*
Counties	**Federal Information Processing Standard (FIPS) Code**
Fresno	06019
Kern	06029
Kings	06031
Madera	06039
Merced	06047
Stanislaus	06099
San Joaquin	06077
Tulare	06107

[1] Monitors from both the District and the Kern County Air Pollution Control District can be counted in determining compliance with minimum monitoring requirements for the Bakersfield MSA. However, only monitors located within the District's boundaries are included in this network plan.

Table 2 Site Identification and AQS AIRS Codes

MSA/CBSA: Fresno		
County: Fresno		
Site Name	**AIRS Code**	**Agency**
Clovis–Villa	060195001	SJVAPCD
Fresno--Drummond	060190007	SJVAPCD
Fresno–First	060190008	CARB
Fresno–Pacific	060195025	SJVAPCD
Fresno–Sky Park	060190242	SJVAPCD
Huron	060192008	SJVAPCD
Parlier	060194001	SJVAPCD
Tranquillity	060192009	SJVAPCD
MSA/CBSA: Bakersfield		
County: Kern (Valley Portion)		
Site Name	**AIRS Code**	**Agency**
Arvin–Di Giorgio	060295002	CARB
Bakersfield–California	060290014	Shared [2]
Bakersfield–Planz	060290016	CARB
Edison	060290007	CARB
Lebec	060292009	SJVAPCD
Maricopa	060290008	SJVAPCD
Oildale	060290232	CARB
Shafter	060296001	Shared [1]

Site Identification and AQS AIRS Codes

MSA/CBSA: Hanford – Corcoran		
County: Kings		
Site Name	**AIRS Code**	**Agency**
Corcoran–Patterson	060310004	SJVAPCD
Hanford--Irwin	060311004	SJVAPCD
Santa Rosa Rancheria	060310500	Tachi-Yokut Tribe
MSA/CBSA: Madera		
County: Madera		
Site Name	**AIRS Code**	**Agency**
Madera–City	060392010	SJVAPCD
Madera–Pump Yard	060390004	SJVAPCD
MSA/CBSA: Merced		
County: Merced		
Site Name	**AIRS Code**	**Agency**
Merced–Coffee	060470003	SJVAPCD
Merced–M Street	060472510	SJVAPCD
MSA/CBSA: Stockton		
County: San Joaquin		
Site Name	**AIRS Code**	**Agency**
Manteca	060772010	SJVAPCD
Stockton--Hazelton	060771002	CARB
Stockton–Wagner/Holt	060773010	SJVAPCD
Tracy–Airport	060773005	SJVAPCD
MSA/CBSA: Modesto		
County: Stanislaus		
Site Name	**AIRS Code**	**Agency**
Modesto–14th Street	060990005	CARB
Turlock	060990006	SJVAPCD
MSA/CBSA: Visalia – Porterville		
County: Tulare		
Site Name	**AIRS Code**	**Agency**
Porterville	061072010	SJVAPCD
Sequoia–Ash Mountain	061070009	National Park Service
Sequoia–Lower Kaweah	061070006	National Park Service
Visalia–Airport	061073000	SJVAPCD
Visalia–Church	061072002	CARB

[1] Site operated by CARB and SJVAPCD

[2] Site operated by CARB and one temporary monitor operated by SJVAPCD.

Table 3 San Joaquin Valley 2009 Population

County	Total County Population	Major Urban Area Pop > 100,000	Urban Area Pop < 100,000 and > 50,000
Fresno	942,298	Fresno	Clovis
Kern (Entire County)	827,173	Bakersfield	Delano
Kern (Valley Portion)	686,967	Bakersfield	Delano
Kings	154,743	--	Hanford
Madera	152,331	--	Madera
Merced	256,450	--	Merced
San Joaquin	689,480	Stockton	Lodi, Manteca, Tracy
Stanislaus	526,383	Modesto	Turlock
Tulare	441,481	Visalia	Porterville, Tulare
SJV Total	**3,850,133**		

Data from California Department of Finance E-4 Population Estimates for Cities, Counties and the State, 2001-2009, with 2000 Benchmark. Estimates for 1/1/2010 are not yet available.

There are several network plan requirements that pertain specifically to PM2.5 monitoring. For example, the monitoring network plan must identify which sites are suitable and which are not suitable for comparison against the annual PM2.5 national ambient air quality standards (NAAQS) as described in 40 CFR 58.30. The plan must also document how agencies provide for public review of changes to the PM2.5 monitoring network when the change impacts the location of a violating PM2.5 monitor or the creation/change to a community monitoring zone. If the District uses spatial averaging, a description of the proposed use of spatial averaging for purposes of making comparisons to the annual PM2.5 NAAQS as required in Appendix N to part 50 should be included. Agencies should submit any public comments received from PM2.5 monitoring changes in the submittal of the network plan.

Monitoring Objectives and Spatial Scales

Appendix D to 40 CFR Part 54 identifies three basic **monitoring objectives**:

- Provide air pollution data to the general public in a timely manner (**timely**/**public**)
- Support compliance with ambient air quality standards and emissions strategy development (**standards**/**strategy**)
- Support for air pollution research studies (**research support**)

Appendix D then identifies several general monitoring **site types** to meet the objectives:

- Sites located to determine the **highest concentrations** in the area covered by the network
- **Population oriented** sites to measure typical concentrations in areas of high population density
- **Source impact** sites to determine the impact of significant sources or source categories on air quality

- **General/background sites** determine background concentration levels
- **Regional transport sites** located to determine the extent of regional pollutant transport among populated areas and in support of secondary standards
- Sites located to measure air pollution impacts on visibility, vegetation damage, or other **welfare-related** impacts

Appendix D also identifies several scales of spatial representativeness, described in terms of physical dimensions of the air parcel or zone where air quality is expected to be reasonably consistent around the monitor. The monitor thus represents that area, not just the point of the monitor. The **spatial scales** are:

- **Microscale**: an area ranging from several meters up to about 100 meters
- **Middle scale**: an area covering between about 100 meters to 0.5 kilometers
- **Neighborhood scale**: covering an area between 0.5 and 4.0 kilometers in range
- **Urban scale**: covering an area of city-like dimensions, from about 4 to 50 kilometers
- **Regional scale**: covering a rural area of reasonably homogeneous geography without large sources, extending from tens to hundreds of kilometers
- **National and global scales**: representing concentrations characterizing the nation and the globe as a whole

New monitoring stations and new monitors must meet EPA siting criteria. A particular site might be appropriate for one or more pollutants. Some sites might be appropriate for all air pollutant monitoring, while other sites might only be appropriate for a particular pollutant. The District balances a wide range of pollutant siting criteria, spatial scales, monitoring objectives, and practical concerns as it plans and operates its monitoring network. Table 4 summarizes all the ambient air monitoring sites in the San Joaquin Valley Air Basin.

Table 4 Ambient Air Monitoring Sites in the San Joaquin Valley Air Basin (Summary)

As of June 1, 2011

MSA, County	Site Name	Address	Parameters Monitored
Fresno, Fresno	Clovis-Villa	908 N. Villa Ave., Clovis, CA 93612	Ozone, PM10 FRM, PM2.5 BAM/FEM, CO, NO2, NMHC, NMOC (PAMS), wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Fresno-Drummond	4706 E. Drummond St., Fresno, CA 93725	Ozone, PM10 FRM, CO, NO2, wind speed, wind direction, outdoor temperature, barometric pressure
	Fresno-First	3425 N. First St, Fresno CA 93726	Ozone, PM10 FRM, PM10 BAM, PM2.5 FRM, PM2.5 BAM, CO, NO2, SO2, toxics, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure
	Fresno-Pacific	1716 Winery, Fresno, CA 93726	PM2.5 FRM
	Fresno-Sky Park	4508 Chennault Ave, Fresno, CA 93722	Ozone, CO, NO2, wind speed, wind direction, outdoor temperature
	Huron	16875 4th St., Huron, CA 93234	PM2.5 BAM, barometric pressure
	Parlier	9240 S. Riverbend Ave., Parlier, CA 93648	Ozone, NO2, NMOC (PAMS), NMHC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Tranquillity	32650 W. Adams, Tranquillity, CA 93668	Ozone, PM2.5 BAM FEM, wind speed, wind direction, outdoor temperature, barometric pressure

MSA, County	Site Name	Address	Parameters Monitored
Bakersfield, Kern	Arvin-Di Giorgio	19405 Buena Vista Blvd, Arvin, CA 93203	Ozone, outdoor temperature
	Bakersfield-Planz	401 E. Planz Rd., Bakersfield CA 93307	PM2.5 FRM
	Bakersfield-California	5558 California Ave., Bakersfield, CA 93309	Ozone, PM10 FRM, PM10 BAM/FEM (temporarily operated by the SJVAPCD), PM2.5 FRM, PM2.5 BAM/FEM, NO2, toxics, Cr^{6+}, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Edison	Johnson Farm-Shed Rd, Edison, CA 93320	Ozone, NO2, wind speed, wind direction, outdoor temperature
	Lebec	Beartrap Road (no #), Lebec, CA 91350	PM2.5 BAM, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
	Maricopa	755 Stanislaus St., Maricopa, CA 93352	Ozone, wind speed, wind direction, outdoor temperature, barometric pressure
	Oildale	3311 Manor St, Oildale, CA 93308	Ozone, PM10 FRM, wind speed, wind direction, outdoor temperature
	Shafter	578 Walker St, Shafter, CA 93263	Ozone, NO2, NMOC (PAMS), NMHC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
Hanford – Corcoran, Kings	Corcoran-Patterson	1520 Patterson Ave, Corcoran, CA 93212	PM10 FRM, PM10 TEOM, PM2.5 FRM, PM2.5 BAM/FEM, wind speed, wind direction, outdoor temperature, barometric pressure
	Hanford-Irwin	807 S. Irwin St, Hanford, CA 93230	Ozone, PM10 FRM, PM2.5 BAM/FEM, NO2, wind speed, wind direction, outdoor temperature, barometric pressure
	Santa Rosa Rancheria	17225 Jersey Ave., Lemoore, CA 93245	Ozone, PM10, meteorology

MSA, County	Site Name	Address	Parameters Monitored
Madera, Madera	Madera-City	28261 Avenue 14, Madera, CA 93638	Ozone, PM10 TEOM, PM2.5 BAM/FEM, wind speed, wind direction, outdoor temperature, barometric pressure, relative humidity, solar radiation
	Madera-Pump Yard	Av 8 and Road 29 1/2, Madera, CA 93637	Ozone, NO2, NMOC (PAMS), NMHC, wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation
Merced, Merced	Merced-Coffee	385 S. Coffee St., Merced, CA 95340	Ozone, PM2.5 BAM/FEM, NO2, wind speed, wind direction, outdoor temperature, barometric pressure
	Merced-M Street	2334 M Street, Merced, CA 95340	PM10 FRM, PM2.5 FRM
Stockton, San Joaquin	Stockton-Hazelton	1593 E. Hazelton St., Stockton, CA 95205	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM, CO, NO2, toxics, wind speed, wind direction, outdoor temperature, relative humidity
	Stockton-Wagner/Holt	8778 Brattle Pl., Stockton, CA 95209	PM10 FRM
	Manteca	530 Fishback Rd., Manteca, CA 95337	PM2.5 BAM/FEM, PM10 (TEOM), wind speed, wind direction, outdoor temperature, barometric pressure
	Tracy-Airport	5749 S. Tracy Blvd., Tracy, CA 95376	Ozone, PM10 TEOM, PM2.5 BAM, NO2, wind speed, wind direction, outdoor temperature, barometric pressure, radio acoustic sounding system (RASS)
Modesto, Stanislaus	Modesto-14th Street	814 14th Street, Modesto, CA 95354	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM, CO, wind speed, wind direction, outdoor temperature, barometric pressure
	Turlock	1034 S. Minaret St., Turlock, CA 95380	Ozone, PM10 FRM, PM2.5 BAM FEM, CO, NO2, wind speed, wind direction, outdoor temperature, barometric pressure

MSA, County	Site Name	Address	Parameters Monitored
Visalia – Porterville, Tulare	Porterville	1839 S. Newcomb St., Porterville, CA 93257	Ozone, PM2.5 BAM, wind speed, wind direction, outdoor temperature, barometric pressure
	Sequoia-Ash Mountain	Ash Mountain, Sequoia National Park CA	Ozone, PM2.5 FRM, PM2.5 BAM, wind speed, wind direction, outdoor temperature, relative humidity, solar radiation
	Sequoia-Lower Kaweah	Lower Kaweah Campground, Sequoia National Park, CA	Ozone, wind speed, wind direction, outdoor temperature, relative humidity, solar radiation
	Visalia-Airport	Airport, Visalia, CA 93291	wind speed, wind direction, outdoor temperature, relative humidity, barometric pressure, solar radiation, radio acoustic sounding system (RASS)
	Visalia-Church	310 N. Church St., Visalia, CA 93291	Ozone, PM10 FRM, PM2.5 FRM, PM2.5 BAM, NO2, wind speed, wind direction, outdoor temperature, barometric pressure

Ozone

Ozone is formed when its precursors (oxides of nitrogen (NOx) and volatile organic compounds (VOC)) chemically react in the presence of sunlight. The Valley's topography, low precipitation levels, high temperatures, subsidence inversions, and light winds are conducive to elevated ozone levels. Winds (at ground level or at higher altitudes) transport pollutants from other basins into the Valley, within the Valley to areas downwind, and from the Valley into other regions.

As shown in Table 5, the Valley's ozone network meets the monitoring requirements as listed in Table D-2 of Appendix D to Part 58. Ozone monitoring site requirements are based on MSA population (see Table 3) and design values (see Table 6). Sites are intended to represent population exposures and maximum concentrations so most ozone monitors are representative of neighborhood and regional scales (see Table 7). The Valley's SLAMS ozone monitors are continuous analyzers that detect ozone through ultraviolet absorption. As continuous devices, these monitors meet the "Timely/Public" objective, providing District staff with the data used in AQI forecasting and reporting. The Valley's ozone monitoring sites are shown in Table 7.

Table 5 SLAMS Minimum Ozone Monitoring Requirements
(Table D-2 of Appendix D to Part 58)

MSA population, based on latest available census figures	Number of monitors required if:	
	Most recent 3-year design value concentrations ≥85% of any ozone NAAQS	Most recent 3-year design value concentrations <85% of any ozone NAAQS
> 10 million	4	2
4 – 10 million	3	1
350,000 – < 4 million	2	1
50,000 – < 350,000	1	0

Table 6 Ozone Requirements for the San Joaquin Valley

Metropolitan Statistical Area (MSA)	2009 Population	Highest 2006-2008 Ozone Design Value in MSA (ppb)[1]	≥85% of 2008 ozone NAAQS (75 ppb)[1]	Number of monitors required (Table 5)	Number of active SLAMS ozone monitor sites
Bakersfield	827,173 [2]	105	Yes	2	6 [2]
Fresno	942,298	100	Yes	2	6
Hanford-Corcoran	154,743	91	Yes	1	1
Madera	152,331	84	Yes	1	2
Merced	256,450	90	Yes	1	1
Modesto	526,383	89	Yes	2	2
Stockton	689,480	83	Yes	2	2
Visalia - Porterville	441,481	103	Yes	2	2

[1] These data are preliminary. Air quality data may include data influenced by exceptional events and/or data completeness and substitution requirements.

[2] The population listed for Bakersfield here reflects the population for all of Kern County, not just the Valley portion. Air monitors in the Eastern Kern Air District would count towards the monitors required for the Bakersfield MSA. However, the "Number of active ozone monitors" listed here includes those in the San Joaquin Valley Air Basin only.

Table 7a San Joaquin Valley Ozone Monitors (SLAMS)

As of June 1, 2011

MSA	County	Site	Scale	Site Type	Monitoring Objective
Fresno	Fresno	Clovis–Villa	Neighborhood	Population	1, 2, 3
		Fresno–Drummond	Neighborhood	Population, Regional transport	
		Fresno–First	Neighborhood	Population	
		Fresno-- Sky Park	Neighborhood	Population, Regional transport	
		Parlier	Neighborhood	High Concentration, Regional transport	

San Joaquin Valley Ozone Monitors (SLAMS)

MSA	County	Site	Scale	Site Type	Monitoring Objective
Bakersfield	Kern	Arvin-Di Giorgio	Neighborhood	High Concentration, Regional transport	1, 2, 3
		Bakersfield-California	Neighborhood	Population	
		Edison	Neighborhood	High concentration, Regional transport	
		Maricopa	Neighborhood	Regional transport	
		Oildale	Neighborhood	Regional transport	
		Shafter	Neighborhood	General/background	
MSA	**County**	**Site**	**Scale**	**Site Type**	**Monitoring Objective**
Hanford-Corcoran	Kings	Hanford-Irwin [1]	Neighborhood	Population	1, 2, 3
MSA	**County**	**Site**	**Scale**	**Site Type**	**Monitoring Objective**
Madera	Madera	Madera–Pump Yard	Neighborhood	General/background	1, 2, 3
		Madera- City	Neighborhood	Population	
MSA	**County**	**Site**	**Scale**	**Site Type**	**Monitoring Objective**
Merced	Merced	Merced–Coffee	Neighborhood	Population	1, 2, 3
MSA	**County**	**Site**	**Scale**	**Site Type**	**Monitoring Objective**
Stockton	San Joaquin	Stockton–Hazelton	Neighborhood	Population	1, 2, 3
		Tracy--Airport	Neighborhood	Regional transport	
MSA	**County**	**Site**	**Scale**	**Site Type**	**Monitoring Objective**
Modesto	Stanislaus	Modesto–14th Street	Neighborhood	Population	1, 2, 3
		Turlock	Neighborhood	Population	

San Joaquin Valley Ozone Monitors (SLAMS)

MSA	County	Site	Scale	Site Type	Monitoring Objective
Visalia - Porterville	Tulare	Visalia–Church	Neighborhood	Population	1, 2, 3
		Porterville	Neighborhood	Population	

1 – Standards/Strategy 2 – Research Support 3 – Timely/Public

[1]Shutdown of the Corcoran-Patterson ozone monitor occurred in November 2009. The monitor was reinstalled at the reconstructed Hanford-Irwin monitoring site in February 2010. During the months in between, the monitor was serviced, calibrated and tested.

Table 7b San Joaquin Valley Ozone Monitors (SPM)

As of June 1, 2011

MSA	County	Site	Scale	Site Type	Monitoring Objective
Fresno	Fresno	Tranquillity [1]	Urban Scale	Population	3
Hanford-Corcoran	Kings	Santa Rosa Rancheria [2]	Tribal monitor		
Visalia - Porterville	Tulare	Sequoia -Ash Mountain [1]	Regional	Regional transport	3
		Sequoia -Lower Kaweah [1]	Regional	Regional transport	3

3 – Research Support Timely/Public

[1] These SPMs can be used for Regulatory purposes.
[2] The status of this Tribal monitor is not known.

PAMS

The monitoring objective of Photochemical Assessment Monitoring Stations is research support. Federal regulations (Clean Air Act Section 182 and 40 CFR 58) require serious, severe, and extreme ozone nonattainment areas to have PAMS sites to take speciated measurements of ozone precursors and allow for better understanding of the effect of precursors, control measures, and photochemistry on ozone formation. PAMS sites measure ozone, NOx, speciated VOC (NMOC and NMHC), CO, and meteorology concurrently.

There are four classifications of PAMS sites:

- Type 1: Background sites upwind of urban areas, where ozone concentrations are presumed not to be influenced by nearby urban emissions
- Type 2: Maximum ozone precursor emissions sites, typically located in an urban center, where emissions strengths are the greatest
- Type 3: Maximum ozone concentration sites, intended to show the highest ozone concentrations

- Type 4: Extreme downwind monitoring sites, which are expected to capture concentrations of transported pollutants but have lower ozone concentrations due to a lack of more local emissions sources (currently not required for the SJV)

As shown in Table 8, the District has a total of six PAMS sites configured as two small networks, one centered around Fresno and one around Bakersfield. The PAMS program operates from June 1 through August 31 every year on a 1 in 3 day sampling schedule. At least four, three-hour integrated samples are collected each sampling day, referred to as a "Trend Day." However, additional samples are collected on "Episode Days," days that are forecasted to have high ozone concentrations. The goal is to sample on three to five multi-day episodes in an ozone season.

Table 8 SJV PAMS sites

As of June 1, 2011

Fresno MSA	Type 1: Upwind/Background site	Madera-Pump Yard
	Type 2: Maximum precursor emissions	Clovis-Villa
	Type 3: Maximum ozone concentrations	Parlier
Bakersfield MSA	Type 1: Upwind/Background site	Shafter
	Type 2: Maximum precursor emissions	Replacement site under construction[1]
	Type 3: Maximum ozone concentrations	Arvin[2]

[1] Bakersfield–Golden was shut down for relocation in December 2009. The District plans to have the replacement site, Bakersfield-Muni, operational in October 2011.
Bakersfield-Muni, will begin reporting data in October 2011. See page 39 for more information.

[2] Arvin-Bear Mountain Blvd. site closed. CARB plans to construct the Arvin-Di Giorgio site for PAMS and is finalizing details before the project begins.

Particulate Matter (PM)

Particulate matter (PM) can be emitted directly as primary PM, and it can form in the atmosphere through chemical reactions of precursors to form secondary PM. Primary PM can be emitted either naturally (windblown dust and wildfires) or from human (anthropogenic) activity: agricultural operations, industrial processes, combustion of wood and fossil fuels, construction and demolition activities, and entrainment of road dust. The resulting ambient PM mixture includes aerosols consisting of components of nitrates, sulfates, elemental Carbons, organic Carbon compounds, acid aerosols, trace metals, geological materials, etc. Under current regulations, particulate matter (PM) is differentiated by particle size as opposed to composition. Federal air quality standards differentiate two size fractions of PM: PM that is 10 microns or less in diameter (PM10) and the smaller subset that is 2.5 microns or less in diameter (PM2.5).

The Valley's comprehensive particulate field study is the California Regional Particulate Air Quality Study (CRPAQS). CRPAQS monitoring occurred between December 1999

and February 2001 through the use of over 70 SPM PM10 sites and 50 SPM PM2.5 sites. Researchers have used CRPAQS measurements for database development, analysis, and modeling. A final report synthesizing all CRPAQS analysis and updating the conceptual understanding of particulates is expected to be completed in 2012. In addition to CRPAQS, other studies assess particulate emissions from agricultural operations, unpaved and paved road particulate emissions, and particulate formation in fog episodes. The design of the Valley's current PM network is an outgrowth of the results and analysis from CRPAQS.

The Valley's surrounding mountain ranges contribute to PM retention. Over the summer, long periods with little or no rainfall result in extreme drying of soils, increasing emissions from traffic movement and mechanical disturbance. Winter brings rainfall, but also creates an atmospheric environment that forms more secondary particulates. The Valley's frequent and severe temperature inversions block the normal rising air and trap particulates close to the ground, especially during the winter months.

The Valley's PM monitoring network includes Federal Reference Method (FRM) monitors, Federal Equivalent Method (FEM) monitors, and Non-FRM/FEM monitors. FRM monitors for PM are manual filter-based monitors; samples are collected on either a one-in-six day sampling schedule or a one-in-three day sampling schedule. FRM monitors meet the "Standards/Strategy" objective, helping agencies determine the Valley's attainment status and helping shape the strategies for reaching or maintaining PM attainment. FRM filters can also be analyzed for PM speciation, so they are sometimes used for "Research Support" objectives as well.

Beta Attenuation Monitors (BAM) and Tapered Element Oscillating Microbalance (TEOM) monitors are continuous, near real-time monitors that provide the hourly PM data used in AQI and Smoke Management System (SMS) burn allocations. Data from these monitors are also used in hazard reduction burning allocations and in residential wood burning declarations. As such, these monitors help meet the "Timely/Public" objective.
Not all real-time monitors meet the "Standards/Strategy" objective because they do not meet the rigorous engineering design, quality assurance, and quality control standards necessary for comparison to the NAAQS. An FEM monitor is often a real-time monitor that has been designated by EPA as being equivalent to FRM monitors. FEMs satisfy both the "Standards/Strategy" objective and the "Timely/Public" objective. All of the Valley's TEOMs are FEMs, and some of the Valley's BAMs are FEMs.

PM10 Monitors in the Valley

The San Joaquin Valley has been redesignated to attainment for PM10, and the District's *2007 PM10 Maintenance Plan* and ongoing PM10 monitoring will assure continued compliance with federal standards. The minimum number of PM10 sites required per MSA is shown in Table 9 and the PM10 monitoring requirements for the San Joaquin Valley are shown in Table 10. Tables 11a, 11b, and 12 summarize the Valley's SLAMS and SPM PM10 monitoring stations, respectively.

Table 9 Minimum PM10 Monitoring Requirements

(Table D-4 of Appendix D to Part 58)

(A range is presented, and the actual number of stations per area is jointly determined by EPA, the State, and the local agency)

Population category	High concentration: Ambient concentrations exceed the PM10 NAAQS by 20% or more (≥180 µg/m³)	Medium concentration: Ambient concentrations exceed 80% of the PM10 NAAQS (>120 µg/m³)	Low concentration: Ambient concentrations less than 80% of the PM10 NAAQS (< 120 µg/m³), or no design value
> 1,000,000	6 – 10	4 – 8	2 – 4
500,000 – 1,000,000	4 – 8	2 – 4	1 – 2
250,000 – 500,000	3 – 4	1 – 2	0 – 1
100,000 – 250,000	1 – 2	0 – 1	0

Table 10 PM10 Monitoring requirements for the Valley

Metropolitan Statistical Area (MSA)	County	2009 Population	PM10			
			24-hour 2009 Highest concentration in MSA (µg/m³) [2]	Monitors required [3]	Actual # of SLAMS sites in MSA	Actual # of SPM sites in MSA
Bakersfield	Kern	827,173 [1]	138	2 – 4	2 [4]	
Fresno	Fresno	942,298	84	1 – 2	3	1
Hanford-Corcoran	Kings	154,743	118	0 – 1	2	2
Madera	Madera	152,331	-	1	1	1
Merced	Merced	256,450	64	0 – 1	1	1
Modesto	Stanislaus	526,383	65	1 – 2	2	
Stockton	San Joaquin	689,480	61	1 – 2	2	1
Visalia - Porterville	Tulare	441,481	92	0 - 1	1	

[1] The population listed for Bakersfield here reflects the population for all of Kern County, not just the Valley portion. Air monitors in the Eastern Kern Air District would count towards the monitors required for the Bakersfield MSA. However, the "Actual # of monitors in MSA" listed here includes those in the San Joaquin Valley Air Basin only.

[2] Max PM10 Data does not include any pending Exceptional Events.

[3] PM10 data does not include collocated monitors.

[4] One temporary PM10 monitor.

Table 11a San Joaquin Valley PM10 SLAMS monitor information

Site Name	Scale	Site Type	Monitoring Objective	Sampling Schedule
MSA/CBSA: Fresno **County:** Fresno				
Fresno-Drummond	Neighborhood	Population	Standards/Strategy Research Support	1:6
Fresno-First	Neighborhood	High Concentration	Standards/Strategy Research Support	1:6
			Research Support Timely/Public	1-Hour
Clovis-Villa	Neighborhood	Population	Standards/Strategy Research Support	1:6
MSA/CBSA: Bakersfield **County:** Kern				
Oildale	Neighborhood	Population	Standards/Strategy Research Support	1:6
Bakersfield-California	Neighborhood	Population	Standards/Strategy Research Support	1:6
				1-Hour [1]
MSA/CBSA: Hanford – Corcoran **County:** Kings				
Hanford-Irwin	Neighborhood	Population	Standards/Strategy Research Support	1:6
Corcoran-Patterson	Neighborhood	High Concentration	Standards/Strategy Research Support	1:3
			Research Support Timely/Public	1-Hour
MSA/CBSA: Madera **County:** Madera				
Madera-City	Neighborhood	Population	Research Support Timely/Public	1-Hour
MSA/CBSA: Merced **County:** Merced				
Merced-M Street	Neighborhood	Representative concentration	Standards/Strategy Research Support	1:6

San Joaquin Valley PM10 SLAMS monitor information

MSA/CBSA: Stockton **County:** San Joaquin				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Manteca	Neighborhood	Population	Standards/Strategy Research Support	1-Hour
Stockton-Hazelton	Neighborhood	Population	Standards/Strategy Research Support	1:6
Stockton-Wagner/ Holt	Neighborhood	Population	Standards/Strategy Research Support	1:6
Tracy-Airport	Neighborhood	Regional transport	Research Support Timely/Public	1-Hour
MSA/CBSA: Modesto **County:** Stanislaus				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Modesto-14th Street	Neighborhood	Population	Standards/Strategy Research Support	1:6
Turlock	Neighborhood	Population	Standards/Strategy Research Support	1:6
MSA/CBSA: Visalia – Porterville **County:** Tulare				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Visalia-Church	Neighborhood	Population	Standards/Strategy Research Support	1:6

[1]Temporary monitor

Table 11b San Joaquin Valley PM10 SPM monitor information

MSA/CBSA: Hanford – Corcoran **County:** Kings				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Hanford-Irwin [1]	Neighborhood	Population	Research Support Timely/Public	1-Hour

[1] This is a new SPM site. Data can be used for Regulatory purposes after the site has been operational for two years.

Table 12 San Joaquin Valley PM10 monitor types

MSA/CBSA: Fresno **County:** Fresno	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Clovis-Villa	1		1	
Fresno-Drummond	1		1	
Fresno-First	1		1	
		1		1
Total SLAMS/SPM			3	1
MSA/CBSA: Bakersfield **County:** Kern	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Bakersfield-California	1		1	
		1[1]		1
Oildale	1		1	
Total SLAMS/SPM			2	1
MSA/CBSA: Hanford – Corcoran **County:** Kings	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Corcoran-Patterson	1 [2]		1	
		1		1
Hanford-Irwin	1		1	
		1		1
Santa Rosa Rancheria [3]	Tribal Monitor			
Total SLAMS/SPM			2	2
MSA/CBSA: Madera **County:** Madera	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Madera-City		1	1	
Total SLAMS/SPM			1	
MSA/CBSA: Merced **County:** Merced	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Merced-M Street	1		1	
Total SLAMS/SPM			1	

San Joaquin Valley PM10 monitor types

MSA/CBSA: Stockton **County:** San Joaquin	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Manteca		1		1
Stockton-Hazelton	1		1	
Stockton-Wagner/Holt	1		1	
Tracy-Airport		1		1
Total SLAMS/SPM			2	2

MSA/CBSA: Modesto **County:** Stanislaus	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Modesto-14th Street	1		1	
Turlock	1		1	
Total SLAMS/SPM			2	

MSA/CBSA: Visalia – Porterville **County:** Tulare	**Instrument Type**		**Monitor Type**	
	FRM	**FEM**	**SLAMS**	**SPM**
Site Name				
Visalia-Church	1		1	
Total SLAMS/SPM			1	

[1] Temporary monitor [2] QA Collocated monitors [3] Status of this Tribal monitor is not known.

PM2.5 Monitors in the Valley

The San Joaquin Valley is designated nonattainment for PM2.5. Table 13 shows the minimum number of PM2.5 sites required per MSA. The minimum number of PM2.5 sites required per MSA is shown in Table 13 and the PM2.5 monitoring requirements for the San Joaquin Valley are shown in Table 14. Tables 15a, 15b, and 16 summarize the Valley's SLAMS and SPM PM2.5 monitoring stations, respectively.

Table 13 Minimum PM2.5 Monitoring Requirements

MSA population	**Most recent 3-year design value ≥85% of any PM2.5 NAAQS** (equivalent to an annual design value ≥ 12.8 µg/m³ or a 24-hour design value ≥ 29.8 µg/m³)	**Most recent 3-year design value <85% of any PM2.5 NAAQS** (equivalent to an annual design value < 12.8 µg/m³ or a 24-hour design value < 29.8 µg/m³), or no design value
> 1,000,000	3	2
500,000 – 1,000,000	2	1
50,000 - < 500,000	1	0

Table 14 PM2.5 Monitoring requirements for the Valley

Metropolitan Statistical Area (MSA)	County	2009 Population	PM2.5				
			24-hour 2007-2009 Design Value in MSA (µg/m³) [2]	Annual 2007-2009 Design Value in MSA (µg/m³)	Monitors required	Actual # of SLAMS sites in MSA	Actual # of SPM sites in MSA
Bakersfield	Kern	827,173[1]	70	22.6	2	2	2
Fresno	Fresno	942,298	60	17.1	2	3	3
Hanford-Corcoran	Kings	154,743	53	17.3	1	1	1
Madera	Madera	152,331	-	-	1	1	
Merced	Merced	256,450	51	14.5	1	1	1
Modesto	Stanislaus	526,383	60	23.2	2	2	
Stockton	San Joaquin	689,480	50	12.9	2	2	1
Visalia-Porterville	Tulare	441,481	59	18.8	1	1	3

[1] The population listed for Bakersfield here reflects the population for all of Kern County, not just the Valley portion. Air monitors in the Eastern Kern Air District would count towards the monitors required for the Bakersfield MSA. However, the "Actual # of monitors in MSA" listed here includes those in the San Joaquin Valley Air Basin only.

[2] These data are preliminary. Air quality data may include data influenced by exceptional events and/or data completeness and substitution requirements.

Table 15a San Joaquin Valley PM2.5 SLAMS monitor information

Site Name	Scale	Site Type	Monitoring Objective	Sampling Schedule
MSA/CBSA: Fresno **County:** Fresno				
Fresno-Pacific	Neighborhood	Population	Standards/Strategy Research Support	Seasonal
Fresno-First	Neighborhood	High Concentration	Research Support Timely/Public	1-Hour
			Standards/Strategy Research Support	Daily
Clovis-Villa	Neighborhood	Population	Research Support Timely/Public	1-Hour
MSA/CBSA: Bakersfield **County:** Kern				
Bakersfield-California	Neighborhood	Population	Research Support Timely/Public	1-Hour
			Standards/Strategy	Daily
Bakersfield-Planz	Neighborhood	Population	Standards/Strategy	1:3
MSA/CBSA: Hanford – Corcoran **County:** Kings				
Corcoran-Patterson	Neighborhood	High Concentration	Standards/Strategy Research Support	Seasonal
			Research Support Timely/Public	1-Hour
MSA/CBSA: Merced **County:** Merced				
Merced-M Street	Neighborhood	Representative concentration	Standards/Strategy Research Support	1:3

San Joaquin Valley PM2.5 SLAMS monitor information

MSA/CBSA: Stockton **County:** San Joaquin				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Manteca	Neighborhood	Population	Standards/Strategy Research Support	1-Hour
Stockton– Hazelton	Neighborhood	Population	Standards/Strategy Research Support	1:3 / 1-Hour [1]
			Research Support Timely/Public	1-Hour
MSA/CBSA: Modesto **County:** Stanislaus				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Modesto– 14th Street	Neighborhood	Population	Standards/Strategy Research Support	1:3 / 1-Hour [1]
			Research Support Timely/Public	1-Hour
Turlock	Neighborhood	Population	Research Support Timely/Public	1-Hour
MSA/CBSA: Visalia – Porterville **County:** Tulare				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Visalia– Church	Neighborhood	Population	Standards/Strategy Research Support	1:3
			Research Support Timely/Public	1-Hour

[1] An FRM was replaced with an FEM

Table 15b San Joaquin Valley PM2.5 SPM monitor information

Site Name	Scale	Site Type	Monitoring Objective	Sampling Schedule
MSA/CBSA: Fresno **County:** Fresno				
Huron	Neighborhood	Population	Research Support Timely/Public	1-Hour
Tranquillity	Urban	Urban	Research Support Timely/Public	1-Hour
MSA/CBSA: Bakersfield **County:** Kern				
Lebec	Neighborhood	Population	Research Support Timely/Public	1-Hour
MSA/CBSA: Hanford – Corcoran **County:** Kings				
Hanford-Irwin	Neighborhood	Population	Research Support Timely/Public	1-Hour
MSA/CBSA: Madera **County:** Madera				
Madera-City	Neighborhood	Population	Research Support Timely/Public	1-Hour
MSA/CBSA: Merced **County:** Merced				
Merced-Coffee	Neighborhood	Population	Research Support Timely/Public	1-Hour

San Joaquin Valley PM2.5 SPM monitor information

MSA/CBSA: Stockton **County:** San Joaquin				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Tracy-Airport	Neighborhood	Regional transport	Research Support Timely/Public	1-Hour
MSA/CBSA: Visalia – Porterville **County:** Tulare				
Site Name	**Scale**	**Site Type**	**Monitoring Objective**	**Sampling Schedule**
Sequoia-Ash Mountain	Regional	Regional transport	Research Support Timely/Public	1-Hour
Porterville	Neighborhood	Population	Research Support Timely/Public	1-Hour

Table 16 San Joaquin Valley PM2.5 monitor types

MSA/CBSA: Fresno **County:** Fresno	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non-FEM**	**SLAMS**	**SPM**
Site Name					
Clovis-Villa		1		1	
Fresno-First	1			1	
			1		1
Fresno-Pacific	1			1	
Huron			1		1
Tranquillity		1			1
Total SLAMS/SPM				3	3
MSA/CBSA: Bakersfield **County:** Kern	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non-FEM**	**SLAMS**	**SPM**
Site Name					
Bakersfield-Planz	1			1	
Bakersfield-California	1			1	
			1		1
Lebec			1		1
Total SLAMS/SPM				2	1

San Joaquin Valley PM2.5 monitor types

MSA/CBSA: Hanford – Corcoran **County:** Kings	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non-FEM**	**SLAMS**	**SPM**
Site Name					
Corcoran-Patterson	1			1	
		1			
Hanford-Irwin		1			1
Total SLAMS/SPM				1	1

MSA/CBSA: Madera **County:** Madera	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non-FEM**	**SLAMS**	**SPM**
Site Name					
Madera-City		1		1	
Total SLAMS/SPM				1	

MSA/CBSA: Merced **County:** Merced	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non-FEM**	**SLAMS**	**SPM**
Site Name					
Merced-Coffee		1			1
Merced-M Street	1			1	
Total SLAMS/SPM				1	1

MSA/CBSA: Stockton **County:** San Joaquin	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non-FEM**	**SLAMS**	**SPM**
Site Name					
Manteca		1		1	
Stockton-Hazelton [1]		1		1	
Tracy-Airport			1		1
Total SLAMS/SPM				2	1

MSA/CBSA: Modesto **County:** Stanislaus	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non-FEM**	**SLAMS**	**SPM**
Site Name					
Modesto-14th Street [1]		1		1	
Turlock		1		1	
Total SLAMS/SPM				2	

San Joaquin Valley PM2.5 monitor types

MSA/CBSA: Visalia – Porterville **County:** Tulare	**Instrument Type**			**Monitor Type**	
	FRM	**FEM**	**Non-FEM**	**SLAMS**	**SPM**
Site Name					
Porterville [2]		1			1
Sequoia-Ash Mountain			1		1
Visalia-Church	1			1	
			1		1
Total SLAMS/SPM				1	3

[1] An FRM was replaced with an FEM.
[2] Data can be used for Regulatory purposes after the site has been operational for two years.

PM Collocation Requirements

(40 CFR 58 Appendix A, Sections 3.2.5 and 3.2.6)

The District's Particulate Matter collocation requirements are met by the "Primary Quality Assurance Organization" (PQAO). ARB is the PQAO for the Valley as well as several other air basins. ARB has requested that the District to collocate one PM-10 monitor. The Corcoran site serves this purpose. The AIRS codes for the collocated pair are: 06-031-0004-88102-1 (this is the primary monitor) and 06-031-0003-88102-3 (this is the collocated monitor).

Public Review of Changes to the PM2.5 Monitoring Network

Public input is required whenever the District proposes to move an existing violating PM2.5 monitor (40 CFR 58.10(c)). The District uses the annual Air Monitoring Network Plan to notify and seek public comment on any planned changes to the existing PM2.5 network. The public has 30 days to comment on the Monitoring Network Plan and any PM2.5 network changes. The plan is posted on the District website, and public notice is published in a newspaper of general circulation in each affected CBSA. The 2011 Monitoring Network Plan was posted for comment May 23, 2011, through June 21, 2011. No public comments were received.

In the event of unanticipated changes to the PM2.5 network that occur outside the Monitoring Network Plan process, the District will post public notice in Valley newspapers, post a document describing the proposed changes on its website, and seek public comment.

Carbon Monoxide

In the past, monitoring has shown that the Valley's Carbon monoxide (CO) concentrations have not exceeded the NAAQS for over a decade. As noted in Section

4.2 of Appendix D of 40 CFR Part 58, there are no minimum requirements of the number of Carbon Monoxide (CO) monitoring sites. The District continues CO monitoring to supplement related meteorological and criteria pollutant data. Table 17 summarizes the Valley's past CO monitoring sites.

Table 17 Carbon Monoxide Monitoring Stations in the San Joaquin Valley

As of June 1, 2011

Site Name	Sampling Frequency	Scale	Site Type	Objective
Clovis–Villa	Continuous	Neighborhood	Population	Standards/ Strategy
Fresno–Drummond	Continuous	Neighborhood	Population	Standards/ Strategy
Fresno–First	Continuous	Neighborhood	Population	Standards/ Strategy
Fresno–Sky Park	Continuous	Neighborhood	Population	Standards/ Strategy
Modesto–14th Street	Continuous	Neighborhood	Population	Standards/ Strategy
Stockton–Hazelton	Continuous	Neighborhood	Population	Standards/ Strategy
Turlock	Continuous	Neighborhood	Population	Standards/ Strategy

A proposed new CO rule (to issue a final rule on August 12, 2011), is proposing to retain the existing NAAQS for CO (the existing primary standards are 9 parts per million (ppm) measured over 8 hours, and 35 ppm measured over 1 hour). EPA is proposing to make changes to the ambient air monitoring requirements for CO, to include monitor placement near highly trafficked roads within urban populations of 1 million or more and to be collocated with Nitrogen dioxide (NO_2) monitors (as part of the January, 2010 revision to the NAAQS for NO_2). Moving an existing monitor to a new location is acceptable.

EPA is also proposing that EPA Regional Administrators would have the authority to require additional monitoring in case-by-case circumstances, such as in areas impacted by major stationary CO sources, in urban downtown areas or urban street canyons, or in areas adversely impacted by meteorological and/or topographical influences. EPA is proposing that the required CO monitors would be operating by January 1, 2013.

Nitrogen Dioxide

EPA strengthened the health-based NAAQS for NO_2, setting a new 1-hour NO_2 standard at the level of 100 parts per billion (ppb) effective April 12, 2010. The

monitoring requirements for this new standard will be based upon population of an area as well as the annual average daily traffic (AADT) count. NO_2 monitors that are required under this new standard are to be operational by January 1, 2013. Table 18 summarizes the Valley's NO_2 monitoring stations.

Table 18 NO_2 Monitoring Stations in the San Joaquin Valley

As of June 1, 2011

Site Name	Sampling Frequency	Scale	Site Type	Objective
Bakersfield–California	Continuous	Neighborhood	Population	Standards/ Strategy,
Clovis–Villa	Continuous	Neighborhood	High Concentration	Standards/ Strategy, Research
Edison	Continuous	Neighborhood	Population	Standards/ Strategy
Fresno–Drummond	Continuous	Neighborhood	High Concentration	Standards/ Strategy
Fresno–First	Continuous	Neighborhood	Population	Standards/ Strategy
Fresno–Sky Park	Continuous	Neighborhood	Population	Standards/ Strategy
Hanford--Irwin	Continuous	Neighborhood	Population	Standards/ Strategy
Madera–Pump Yard	Continuous	Neighborhood	Population	Standards/ Strategy, Research
Merced–Coffee	Continuous	Neighborhood	Population	Standards/ Strategy
Parlier	Continuous	Neighborhood	Population	Standards/ Strategy, Research
Shafter	Continuous	Neighborhood	Population	Standards/ Strategy, Research
Stockton–Hazelton	Continuous	Neighborhood	Population	Standards/ Strategy
Tracy–Airport	Continuous	Neighborhood	Population	Standards/ Strategy
Turlock	Continuous	Neighborhood	Population	Standards/ Strategy
Visalia--Church	Continuous	Neighborhood	Population	Standards/ Strategy

As noted in Section 4.3 of Appendix D of 40 CFR Part 58, one microscale near-road NO_2 monitoring station is required in each CBSA with a population of 500,000 or more. Installation of four sites within the District is dependent upon securing funding from EPA. Existing Clean Air Act Section 105 funding is already fully allocated to operate the existing air monitoring network. Provided funding is secured, the District and CARB will collaborate in locating suitable sites for the four stations. One station will be installed in each of the following counties: San Joaquin, Stanislaus, Fresno, and the valley portion of Kern County. Near-road NO_2 monitoring stations shall be sited near major roads with high AADT counts where maximum hourly NO_2 concentrations are expected to occur.

Although the Valley does not exceed federal or state standards for NO_2, NOx reductions contribute to air quality improvement for both ozone and PM. A schedule to install equipment for measuring NO/NOy at the Arvin-Di Giorgio and Parlier monitoring sites is currently being determined.

Sulfur Dioxide

For the years of 2010 through 2012 Section 4.4 of Appendix D of 40 CFR Part 58 does not specify any minimum requirements for the number of SO_2 monitoring sites. Because the Valley does not exceed the federal standard for SO_2, there is just one SO_2 monitoring site in the Valley (shown in Table 19a). This monitor is operated by CARB and is part of the NCore Network.

Table 19a SO_2 Monitoring Station in the San Joaquin Valley
As of June 1, 2010

Site Name	Sampling Frequency	Scale	Site Type	Objective
Fresno-First	Continuous	Neighborhood	Population	Standards/ Strategy

EPA revised the SO_2 NAAQS and monitoring requirements in the Federal Register on June 22, 2010 (CFR, 40 CFR Part 58, Section 4.4). The rule became effective on August 23, 2010). The number of monitor requirements is based upon CBSA's most recently available census data multiplied with the total amount of SO_2 in tons per year emitted from the most recently available data from the National Emissions Inventory for each county, divided by one million, providing a Populations Weighted Emissions Index (PWEI) value in units of million persons-tons per year (Table 19b).

Table 19b Populations Weighted Emissions Index for the San Joaquin Valley
As of June 1, 2011

County (CBSA)	Total County Population[1]	SO_2 Tons per Year[2]	PWEI
Fresno	942,298	458	432
Kern	827,173	2212	1,830
Kings	154,743	55	9
Madera	152,331	113	17
Merced	256,450	66	17
San Joaquin	689,480	1097	756
Stanislaus	526,383	312	164
Tulare	441,481	122	54

[1] Total County Population includes the entire county. Population data was from the most recently available data from the CA Department of Finance E-4 Population Estimates from Cites, Counties and the State, 2001-2009, with 2000 Benchmark. Estimates are for 1/1/2009.

[2] SO_2 Tons per Year includes the entire county. SO_2 data is from the most recent data available from the 2008 National Emissions Inventory for each county.

As per 40 CFR Part 58, Section 4.4, Appendix D any CBSA with a calculated value equal to or greater than 5,000, but less than 100,000, a minimum of one SO_2 monitor is required within that CBSA. There are no minimum requirements for the number of SO_2 monitoring sites in the District because the Valley does not exceed the federal standard for SO_2.

Lead

EPA revised the lead NAAQS and monitoring requirements in the Federal Register on November 12, 2008 (73 FR 66964 – 67062, codified in 40 CFR 58.10). The rule became effective on January 26, 2011 and requires monitoring agencies to install non-source oriented lead monitors at NCore sites by December 27, 2011, in CBSAs that exceed a population of 500,000. The only site meeting these criteria within the District is Fresno-1st which is operated by the California Air Resources Board. The EPA is also requiring source-oriented lead monitoring at areas with a threshold of 1.0 ton per year (tpy). The District has not identified any sources at the 1.0 tpy threshold, thus source-oriented monitoring is not required.

Toxics

Airborne toxic substances are monitored by the CARB at Bakersfield–California, Fresno--First, and Stockton–Hazelton. Periodic, 24-hour samples are analyzed for the following gases: benzene, Carbon tetrachloride, chloroform, ethylene dibromide, ethylene dichloride, methyl chloroform, methylene chloride, perchloroethylene, toluene,

trichloroethylene, and m-, p-, and o-xylene. The samples are also analyzed for the following particulate metals: arsenic and chromium-6. CARB's Integrated NMOC sampling program and the District's PAMS NMOC sampling program also identify and quantify several toxic hydrocarbon species.

Green House Gases

For the year 2010 CARB installed Picarro multi-gas analyzers (CO2, CH4, and water vapor) and a Teledyne-API 300 EU (CO) analyzer at the Madera-Pump Yard, Tranquillity, and Arvin sites. While the data will not be submitted to AQS at this time, the data will be used by CARB's Research Division. CARB plans to continue monitoring Green House Gases (GHG) at these sites in 2011.

NCore

EPA's October 2006 ambient air monitoring amendments established a requirement for National Core (NCore) multi-pollutant monitoring stations. An NCore plan was to be submitted to EPA, and NCore stations must be operational by January 1, 2011. EPA selected the Fresno-First Street air monitoring station (operated by ARB) as an NCore site.

ARB submitted an NCore plan to EPA in November 2009. Fresno--First already met NCore requirements for filter-based and continuous PM2.5, speciated PM2.5, ozone, and meteorology. ARB staff installed trace level CO, trace level SO_2, trace level NOy, and continuous PM-Coarse monitors at this site in December 2010. ARB staff also installed a gas dilution calibrator, a zero air generator, and digital data loggers to support NCore monitoring. In December 2011, ARB staff will install a TSP-lead sampler, completing all the pollutant monitoring requirements for the NCore program. All the newly installed instrumentation will be reporting data to EPA's AQS databases by the end of May 2011."

Meteorology

Data for a variety of meteorological variables are collected to aid various programs affected by weather. Such programs include forecasting air quality, exceptional events, long-term planning, and pollutant trend assessment. These activities help protect public health and have made the public and media more aware of air quality and what can be done to reduce air pollution. See Table 20 for the meteorological parameters measured in the Valley.

Table 20 Meteorological Parameter Monitoring Stations in the San Joaquin Valley

As of June 1, 2011

Site	Wind Speed	Wind Direction	Outdoor Temperature	Relative Humidity	Barometric Pressure	Solar Radiation
Arvin–Di Giorgio			X			
Bakersfield–California	X	X	X	X	X	X
Clovis–Villa	X	X	X	X	X	X
Corcoran–Patterson	X	X	X		X	
Edison	X	X	X			
Fresno–Drummond	X	X	X		X	
Fresno–First	X	X	X	X	X	
Fresno--Sky Park	X	X	X			
Hanford--Irwin	X	X	X		X	
Huron					X	
Lebec	X	X	X		X	
Madera–City	X	X	X	X	X	X
Madera–Pump Yard	X	X	X	X	X	X
Manteca	X	X	X		X	
Maricopa	X	X	X		X	
Merced–Coffee	X	X	X			
Modesto–14th Street	X	X	X		X	
Oildale	X	X	X			
Parlier	X	X	X	X	X	X
Porterville	X	X	X		X	
Santa Rosa Rancheria	Unknown					
Sequoia–Ash Mountain	X	X	X	X		X
Sequoia–Lower Kaweah	X	X	X	X		X
Shafter	X	X	X	X	X	X
Stockton–Hazelton	X	X	X	X		
Tracy–Airport	X	X	X		X	
Tranquillity	X	X	X		X	
Turlock	X	X	X		X	
Visalia–Church	X	X	X		X	
Visalia--Airport	X	X	X	X	X	X

Summary of completed changes, January 2010 – July 2011

- The Arvin-Bear Mountain Blvd site operated by CARB had to be relocated due to an expired lease in 2010 so the Arvin-Di Giorgio monitoring site is intended to be the long-term replacement for the Arvin-Bear Mountain Blvd site. The Arvin-Di Giorgio site became operational in May 2010 and is operated by CARB. Parallel ozone monitoring was completed in November 2010 and the Arvin-Bear Mountain Blvd. site was then closed.

  The Arvin-Di Giorgio site is located 18 miles southeast of the Bakersfield, CA metropolitan area and is approximately 2 miles away from the old site. The purpose of the site is to monitor maximum ozone concentrations and transport from upwind urban areas. This site will also be a PAMS Type 3 site. The site also monitors NO_2, NMOC, NMHC, and meteorology and CARB plans to install methane/CO2 and trace CO analyzers for special purpose monitoring. In addition, a NOy monitor will be added to the Arvin-Di Giorgio air monitoring site to comply with the latest regulation for PAMS Type 3 sites.

- CARB installed Picarro multi-gas analyzers (CO2, CH4, and water vapor) and a Teledyne-API 300 EU (CO) analyzer at the Madera-Pump Yard, Tranquillity, and Arvin Di-Giorgio sites as part of its GHG monitoring program. While the data will not be submitted to AQS at this time, the data will be used by CARB's Research Division.

- A system-wide change that was made in 2010 was the addition of ammonia denuders to all of the NOx analyzers at all of the District sites than measure NOx.

- Anderson sampling instruments at the Fresno-Pacific, Merced-M Street, and Corcoran monitoring sites have been replaced with Partisol Units.

- Three new monitoring stations were installed and became operational in the District in 2010. The Manteca site monitors PM2.5, PM10, and meteorology, the Madera-City site monitors ozone, PM2.5, PM10, and meteorology, and the Porterville site monitors ozone, PM2.5, and meteorology.

- The Hanford monitoring station has been operational for many years and over time had become dilapidated and in need of repairs. The site underwent reconstruction in 2009 and was finished and resumed operations in February 2010.

Summary of planned changes, July 2011 – December 2011

The Valley air monitoring network is continually being improved. As one overall change, the District will be replacing filter-based PM monitors with continuous, real-time PM2.5 and real-time PM10 monitors in the future, particularly in rural areas. These monitors

are more economically efficient than filter-based monitors and give the District more data for forecasting. Simultaneously, the District will be investigating to see how real-time data compares to filter-based data at sites with parallel monitoring.

The planned site-specific changes are described below.

Once funding is secured from EPA, the District and CARB will begin the process of finding locations for four microscale near-road NO_2 monitoring stations that will be installed within the District's boundaries to meet the requirement listed in Section 4.3 of Appendix D of 40 CFR Part 58. One station will be installed in each of the following counties: San Joaquin, Stanislaus, Fresno, and the Valley portion of Kern County.

Stockton CBSA/MSA

A PM10 TEOM Special Purpose Monitor (SPM) has been installed at the Manteca site to compare with PM10 measurements from the Stockton Wagner/Holt PM10 monitor. If the results show that the measurement prove similar enough, the Wagner/Holt monitor will be shut down and a permanent PM10 monitor (TEOM) will be installed at Manteca.

Modesto CBSA/MSA

The District does not have any changes scheduled for this MSA during this time.

Merced CBSA/MSA

The District does not have any changes scheduled for this MSA during this time. The District's long-term plan is to investigate consolidating the Merced-Coffee and Merced-M Street sites. No changes are planned at this time.

Madera CBSA/MSA

The District does not have any changes scheduled for this MSA during this time.

Fresno CBSA/MSA

Recently planted vegetation on adjacent property may require the District to relocate the Fresno-Sky Park site sometime over the next few years. There are no definite relocation plans at this time.

In addition, a NOy monitor will be added to the Parlier air monitoring site to comply with the latest regulation for PAMS Type 3 sites.

Hanford-Corcoran CBSA/MSA

The District does not have any changes scheduled for this MSA during this time.

Visalia-Porterville CBSA/MSA

The District does not have any changes scheduled for this MSA during this time.

Bakersfield CBSA/MSA

In December 2009, the Bakersfield-Golden site was shut down for relocation due to adjacent highway expansion. The replacement site, Bakersfield-Muni, will be located at the Bakersfield Municipal Airport in the Bakersfield, CA and will be about 790 meters (0.5 miles) away from CARB's Bakersfield-Planz site. This location was chosen because the airport's runway, most of the airport activities, and the dirt fields in the area are an ample distance away, and a sufficient power source is nearby. The District plans to have the Bakersfield-Muni site operational in October 2011 and will be operated by the SJVAPCD. This site will measure maximum ozone precursor emissions and will serve as a PAMS Type 2 site. The District plans to install analyzers for ozone, PM10 TEOM, PM2.5 BAM (non-regulatory), CO, NO_2, NMOC (PAMS), NMHC. Instruments for monitoring meteorology will also be installed. Once this Bakersfield-Muni site is operational, it is anticipated that the Bakersfield-Planz monitoring station will be relocated to the Bakersfield-Muni site and the Bakersfield-Planz site will be closed.

After the shutdown of the Bakersfield-Golden site, the District requested CARB's permission to temporarily operate a real time PM10 monitor at the Bakersfield-California site (06-029-0014). The sampler (a BAM PM10 FEM) began to operate in March, and its real-time data will contribute to the District's production of more accurate daily AQI forecasting. When the relocation of the new site is completed, this BAM monitor will be removed and the new site will continue PM10 monitoring with the established TEOM sampler.

The Arvin-Di Giorgio site will to monitor maximum ozone concentrations and transport from upwind urban areas, and serve as a PAMS Type 3 site (SLAMS). An NOy monitor will be added to the Arvin-Di Giorgio air monitoring site to comply with the latest regulation for PAMS Type 3 sites. Plans to construct a building at the Arvin-DiGiorgio site for monitoring NO_2 are being determined. CARB also plans to install methane/CO_2 and trace CO analyzers for special purpose monitoring.

Construction of shelters and installation of PAMS equipment for the Bakersfield-Muni and Arvin-Di Giorgio sites are planned but will not be completed in time for the 2011 PAMS season so these PAMS sites will be down during that time.

Data Submission Requirements

Precision data are submitted to AQS on an ongoing basis each quarter as the data is uploaded into AQS. The accuracy data is submitted into AQS by CARB based on their scheduled audits. The District submitted its 2010 data certification to the EPA. Annual certifications are due by May 1 of each year.

Acronyms, Abbreviations, and Initialisms

AIRS:	Aerometric Information Retrieval System; replaced with AQS
AQI:	Air Quality Index
AQS:	Air Quality System
CARB:	California Air Resources Board
ARM:	approved regional method
BAM:	beta attenuation monitor
CAA:	Clean Air Act
CBSA:	Core-based statistical area
CCOS:	Central California Ozone Study
CFR:	Code of Federal Regulations
CRPAQS:	California Regional Particulate Air Quality Study
CO:	Carbon Monoxide
CO_2:	Carbon Dioxide
CSA:	Combined statistical area
District:	San Joaquin Valley Air Pollution Control District
EBAM:	environmental beta attenuation monitor
EPA:	U.S. Environmental Protection Agency
FEM:	Federal Equivalent Method
FIPS:	Federal information processing standard
FR:	Federal Register
FRM:	Federal Reference Method
GHG:	green house gases
MSA:	Metropolitan statistical area
NAAQS:	National Ambient Air Quality Standard
NCore:	National Core
NMHC:	Non-methane hydrocarbons
NMOC:	non-methane organic carbons
NO_2:	Nitrogen Dioxide
NOAA:	National Oceanic and Atmospheric Administration
NOx:	oxides of nitrogen
NO_y:	reactive nitrogen
NPS:	National Park Service
O_3:	ozone
PAMS:	Photochemical Assessment Monitoring Station
Pb:	lead
PM:	particulate matter
PM2.5:	particulate matter 2.5 microns or less in diameter
PM10:	particulate matter 10 microns or less in diameter
SLAMS:	State and Local Air Monitoring Station
SJV:	San Joaquin Valley
SJVAPCD:	San Joaquin Valley Air Pollution Control District
SMS:	Smoke Management System
SO_2:	Sulfur Dioxide
SPM:	Special Purpose Monitor
STN:	Speciated Trends Network
TEOM:	Tapered Element Oscillating Microbalance
TSP:	total suspended particles
Valley:	San Joaquin Valley
VOC:	Volatile Organic Compounds

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Appendix A: Monitoring Site Descriptions

Sites operated by the SJVAPCD

Bakersfield-Muni

The Bakersfield-Golden site was shut down for relocation in December 2009. The replacement site, Bakersfield-Muni, will be located in the Bakersfield, CA metropolitan area. The Bakersfield-Muni site will begin operating in October 2011 and will be operated by the SJVAPCD. This site will serve as a PAMS Type 2 site, sited to measure maximum ozone precursor emissions and will monitor ozone, PM10 TEOM, PM2.5 BAM (non-regulatory), CO, NO_2, NMOC (PAMS), NMHC, and meteorology. Bakersfield, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow, pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants, which scavenge the ozone. During the winter months, ozone concentrations decrease due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind blown dust events, when the wind can cause PM2.5 to become suspended in the air. On rare occasions, this region of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase and sometimes exceed the NAAQS.

Clovis-Villa

Clovis, CA is located in the central part of the San Joaquin Valley with mountains to the east and northeast. North-south air flow is virtually unobstructed. Pollutant emissions occur locally and are also transported from upwind and nearby locations into the area by the wind. The Clovis-Villa monitoring site is operated by SJVAPCD and is located in the northeastern portion of the Fresno, CA metropolitan area. It began operating in September 1990. This site is a PAMS Type 2 site, a site intended to measure maximum ozone precursor emissions. In addition to ozone (SLAMS), the site also monitors PM2.5 (BAM FEM/SLAMS), PM10 (FRM, SLAMS), CO, NO_2, NMOC, NMHC, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants, which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also

increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Corcoran-Patterson

Corcoran, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutant emissions occur locally and also get transported from upwind locations into the area by the wind. The Corcoran-Patterson monitoring site is operated by SJVAPCD and is located 67 miles south of the Fresno, CA metropolitan area. It began operating in October 1996. The purpose of the site is to monitor representative concentrations of PM10 (TEOM and FRM, both SLAMS) and PM2.5 (FRM, SLAMS and a BAM SPM) and responses from surrounding areas. This site also monitors meteorology. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Fresno-Drummond

Fresno, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Fresno-Drummond monitoring site is operated by SJVAPCD and is located in the Fresno, CA metropolitan area. It began operating in July 1984. The purpose of the site is to monitor representative concentrations of hourly ozone responses in an urban area. In addition to ozone (SLAMS), the site also monitors PM10 (FRM, SLAMS), CO, NO_2, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures.

Fresno-Pacific

Fresno, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Fresno-Pacific monitoring site is operated by SJVAPCD and is located in the Fresno, CA metropolitan area. It began operating in January 2000. The purpose of the site is to monitor representative PM2.5 (FRM, SLAMS) concentrations in an urban area. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning

activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Fresno-Sky Park

Fresno, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Fresno-Sky Park monitoring site is operated by SJVAPCD and is located in the Fresno, CA metropolitan area. It began operating in July 1986. The purpose of the site is to monitor representative concentrations of hourly ozone responses in an urban area. In addition to ozone (SLAMS), the site also monitors CO, NO_2, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. .

Hanford-Irwin

Hanford, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Hanford-Irwin monitoring site is operated by SJVAPCD and is located 51 miles south of the Fresno, CA metropolitan area. The site began operating in October 1993 and was decommissioned in October 2007 due to plans to move it to a different part of the Irwin location. The purpose of the site is to monitor representative concentrations of hourly ozone, PM2.5, and PM10 (FRM and TEOM, both SLAMS) responses from upwind and nearby urban areas. The PM2.5, PM10, and ozone monitors were temporarily moved to Corcoran during site reconstruction. In February 2010, the ozone (SLAMS) and PM2.5 (BAM, SLAMS) monitors were returned to Hanford and the site became operational again. The PM10 monitor was returned and became operational in July 2010. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Huron
Huron, CA is located in southwestern Fresno County, and is about 40 miles southwest of Fresno, CA, with the coastal mountain range just to the west. North-south air flow is virtually unobstructed. This monitoring site was established in January 2007 in order to comply with Assembly Bill (AB) 841. Currently, this site only measures PM2.5 (SPM), as required by AB 841.

Lebec
Lebec, CA is located in the southern-most portion of the San Joaquin Valley. The Lebec monitoring station was initiated by the Tejon Ranch in 2004, and the District assumed responsibility for this site as of January 2009. This site allows the District to better understand pollution impacts in the southern San Emigdio Mountains. The site measures meteorological parameters and PM2.5 (SPM). This site will be used for general residential wood burning declarations for the Greater Frazier Park Area in the future. The site is not yet reported on AQS.

Madera-City
Madera, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. The Madera-City monitoring site is located closer to the city center of Madera than the Madera-Pump Yard site. The Madera-City site is operated by the SJVAPCD and became operational in June 2010. The site monitors ozone (SLAMS), PM2.5 (BAM FEM, SLAMS), PM10 (TEOM, SLAMS), and meteorology. The purpose of this site is to measure down wind concentrations of the city of Madera which will provide needed information about the variability of air quality levels on the Valley floor of Madera County.

Madera-Pump Yard
Madera, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations. The Madera-Pump Yard Street monitoring site is operated by SJVAPCD and is located in the Madera, CA. It began operating in August 1997. This site was established as a PAMS Type 1 site, located in an area upwind of Fresno and not to be influenced by upwind or local ozone precursor emissions. In addition to ozone (SLAMS), this site also monitors CO, NMOC, NMHC, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures.

Manteca
Manteca, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or

through the Sacramento Delta from the Bay Area. The Manteca monitoring site is operated by SJVAPCD is located in Manteca, CA operated by SJVAPCD. It became operational in November 2010. The purpose of the site is to monitor transport of and representative concentrations of PM2.5 (BAM/FEM, SLAMS), and PM10 (TEOM, SLAMS) from upwind and nearby urban areas. The site also monitors meteorology. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 and PM2.5 exceedances due to wind events are rare.

Maricopa

Maricopa, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. The Maricopa monitoring site is operated by the SJVAPCD and is located 45 miles southwest of the Bakersfield, CA metropolitan area. It began operating in July 1987. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS) in a rural area. The site also monitors meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures.

Merced-Coffee

Merced, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations. The Merced-Coffee monitoring site is operated by SJVAPCD and is located in the Merced, CA. It began operating in October 1991. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS) responses from upwind urban areas. The site also monitors PM2.5 (SPM), NO_2, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures.

Merced-M Street

Merced, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations. The

Merced-M Street monitoring site is operated by SJVAPCD and is located in the Merced, CA. It began operating in April 1999. The purpose of the site is to monitor representative concentrations of PM2.5 (FRM, SLAMS) and PM10 (FRM, SLAMS) responses from upwind urban areas. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Parlier

Parlier, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Parlier monitoring site is operated by SJVAPCD and is located 20 miles southeast of the Fresno, CA metropolitan area. It began operating in March 1983. The purpose of the site, as a PAMS Type 3 site, is to monitor maximum ozone concentrations (SLAMS) and ozone responses from upwind urban areas. The site also monitors NO_2, NMOC, NMHC, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures.

Porterville

Porterville, CA is located in the southern part of the San Joaquin Valley near the foothills of the Sierra Nevada Mountains to the east. It is approximately 25 miles southeast of Visalia, CA, and so transport of pollutants from Visalia towards Porterville is possible. The site monitors ozone (SLAMS), PM2.5 (BAM, SPM), and meteorology. The purpose of this site is to represent air quality levels present near the foothills of the southern Valley and give the district an indication of exposure of pollutants to the local population.

Stockton-Wagner/Holt

Stockton, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or through the Sacramento Delta from the Bay Area. The Stockton-Wagner/Holt monitoring site is operated by SJVAPCD and is located in the Stockton, CA metropolitan area. It began operating in October 1996. The purpose of the site is to monitor representative concentrations of PM10 (FRM, SLAMS) in an urban area. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Tracy-Airport

Tracy, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or through the Sacramento Delta from the Bay Area. The Tracy-Airport monitoring site is operated by SJVAPCD and is located in Tracy, CA. It began operating in January 2005. The purpose of the site is to monitor transport of ozone (SLAMS), PM2.5 (BAM, SPM), and PM10 (TEOM, SLAMS) from upwind and nearby urban areas. The site also monitors NO_2 and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Tranquillity

Tranquillity, CA is located in western Fresno County, and is about 25 miles west of Fresno, CA, with the coastal mountain range just to the west. North-south air flow is virtually unobstructed. This monitoring site was established in November 2009 for research purposes, in an effort to better understand the Valley's background and rural pollutant concentrations. This site measures ozone (SPM), PM2.5 (BAM, SPM) and meteorological parameters.

Turlock

Turlock, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or through the Sacramento Delta from the Bay Area. The Turlock monitoring site is operated by SJVAPCD and is located in the Turlock, CA. It began operating in April 1992. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS), PM2.5 (BAM FEM, SLAMS), and PM10 (FRM, SLAMS) responses from upwind urban areas. The site also monitors CO, NO_2, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events

because the wind can cause PM2.5 to become suspended in the air. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Visalia-Airport

Visalia, CA is located where the central and southern parts of the San Joaquin Valley meet. The Sierra Nevada mountain range is approximately 20 miles east of Visalia. North-south air flow is virtually unobstructed. The Visalia-Airport monitoring site is operated by SJVAPCD and serves as a wind profiler monitoring surface wind speed and wind direction. It also monitors air temperature, and relative humidity at the surface. It began reporting official meteorological data in January 2001. Meteorological parameters have a direct influence on how and where pollutants are transported and how much pollutant concentrations increase or decrease.

Sites Operated by the CARB

Arvin-Di Giorgio

Arvin, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Arvin-Di Giorgio site is located 18 miles southeast of the Bakersfield, CA metropolitan area. The purpose of the site, as a PAMS Type 3 site (SLAMS), is to monitor maximum ozone concentrations and transport from upwind urban areas. The site also monitors NO_2, NMOC, NMHC, and meteorology and CARB plans to install methane/CO_2 and trace CO analyzers for special purpose monitoring. In addition, a NOy monitor will be added to the Arvin-Di Giorgio air monitoring site to comply with the latest regulation for PAMS Type 3 sites. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations decrease due to shorter daylight hours and lower temperatures. Pollutants occur locally and also get transported into the area by wind.

Bakersfield-Planz

Bakersfield, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Bakersfield-Planz monitoring site is operated by CARB and is located 6 miles north of the Bakersfield, CA metropolitan area. It began operating in September 2000. The purpose of the site is to monitor representative concentrations of PM2.5 (FRM, SLAMS) from upwind and nearby urban areas. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric

chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air.

Bakersfield-California

Bakersfield, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Bakersfield-California monitoring site is operated by CARB and is located in the Bakersfield, CA metropolitan area. It began operating in March 1994. The purpose of the site is to monitor representative concentrations of hourly and daily ozone (SLAMS), PM10 (FRM and BAM FEM, both SLAMS), and PM2.5 (FRM and BAM FEM, bother SLAMS) responses in an urban area. The site also monitors NO_2 and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air.

Edison

Edison, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Edison monitoring site is operated by CARB and is located 9 miles east of the Bakersfield, CA metropolitan area. It began operating in January 1980. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS) from upwind and nearby urban areas. The site also monitors NO_2 and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations decrease due to shorter daylight hours and lower temperatures.

Fresno-First

Fresno, CA is located in the central part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Fresno-First monitoring site is operated by CARB and is located in the Fresno, CA metropolitan area. It began operating in January 1990. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS), PM2.5 (FRM and BAM, both SLAMS), and PM10 (FRM and BAM, both SLAMS) responses in an urban area. The site also monitors CO, NO_2, SO_2, NMOC, NMHC, toxics, and meteorology. During the

summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Modesto-14th Street

Modesto, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or through the Sacramento Delta from the Bay Area. The Modesto-14th Street monitoring site is operated by CARB and is located in the Modesto, CA metropolitan area. It began operating in January 1981. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS), PM2.5 (FRM and BAM, both SLAMS), and PM10 (FRM, SLAMS)responses in local and upwind urban areas. The site also monitors CO and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. Occasionally, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Oildale

Oildale, CA is located at the southern end of the San Joaquin Valley with mountains to the east, west, and south. Because the mountains block or slow down air flow pollutants can get trapped and build up in the area. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Oildale monitoring site is operated by CARB and is located 6 miles north of Bakersfield, CA within the metropolitan area. It began operating in January 1980. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS) responses and PM10 (FRM, SLAMS) every 6 days in an urban area. The site also monitors meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night

with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. Not only does the metropolitan area generate its own pollution, it is also the recipient of pollutants that get transported by wind. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

Shafter

Shafter, CA is located at the southern end of the San Joaquin Valley with mountains to the east and west, and 58 miles to the south. Because the mountains to the south are further away, southward air flow is less obstructed through Shafter so pollutant build-up is less pronounced compared to Bakersfield and the towns further south. Pollutants occur locally and wind can transport pollutants into and through Shafter from nearby and upwind areas. The Shafter monitoring site is operated by CARB and is located 18 miles northwest of the Bakersfield, CA metropolitan area. It began operating in January 1989. This site was established as a PAMS Type 1 site (SLAMS), located in an area upwind of Bakersfield and not to be influenced by upwind or local ozone precursor emissions. The site also monitors NO_2, NMOC, NMHC, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. Being located upwind of Bakersfield, the Shafter site tends to have lower ozone concentrations than does the metropolitan area to the south.

Stockton-Hazelton

Stockton, CA is located in the northern part of the San Joaquin Valley with mountains to the east and west. North-south air flow is virtually unobstructed. Pollutants occur locally but the wind also transports pollutants into the area from upwind locations or through the Sacramento Delta from the Bay Area. The Stockton-Hazelton monitoring site is operated by CARB and is located in the Stockton, CA metropolitan area. It began operating in June 1976. The purpose of the site is to monitor representative concentrations of ozone (SLAMS), PM2.5 (BAM and FRM, both SLAMS), and PM10 (FRM, SLAMS) in an urban area. The site also monitors CO, NO_2, toxics, and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Visalia-Church

Visalia, CA is located where the central and southern parts of the San Joaquin Valley meet. The Sierra Nevada mountain range is approximately 20 miles east of Visalia. North-south air flow is virtually unobstructed. Pollutants occur locally and also get transported from upwind locations into the area by the wind. The Visalia-Church monitoring site is operated by CARB. It began operating in July 1979. The purpose of the site is to monitor representative concentrations of hourly ozone (SLAMS), PM2.5 (BAM and FRM, both SLAMS), and PM10 (FRM, SLAMS) responses from upwind and nearby urban areas. The site also monitors NO_2 and meteorology. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. During the winter months, ozone concentrations tend to be lower due to shorter daylight hours and lower temperatures. Elevated PM2.5 concentrations are possible year round, but concentrations tend to be highest during the winter months due to moisture content in the air, wood burning activities, other anthropogenic activities, and atmospheric chemistry. PM2.5 concentrations can also increase during wind events because the wind can cause PM2.5 to become suspended in the air. On rare occasions, wind will carry dust across the city and cause PM10 concentrations to increase, but PM10 exceedances are rare.

Special Purpose Monitoring Sites

Sequoia-Ash Mountain

The Ash Mountain monitoring station is operated by Sequoia National Forest and is located at the southern entrance of Sequoia National Park at a 1,500-foot elevation. It originally began operating in 1985, though the site has been relocated several times over the years. The site demonstrates the hourly ozone (SPM) response in the foothills. The site also monitors PM2.5 (BAM, SPM) and meteorology. On summer days, ozone and precursors can be transported to Ash Mountain from other locations. At this location, there are significantly lower hourly emissions of NOx as compared to urban areas such as Bakersfield, or Fresno, CA. The amount of available NOx at Ash Mountain to scavenge the ozone is much lower. Because the ozone scavenging at Ash Mountain is much less than the ozone scavenging in urban areas, Ash Mountain can experience elevated ozone concentrations for a 24-hour period during ozone episodes. Since the ozone concentration is already fairly high at dawn, only a relatively small amount of additional ozone can cause levels in the atmosphere to exceed federal standards.

Sequoia-Lower Kaweah

The Lower Kaweah monitoring station is operated by Sequoia National Forest and is located at the southern entrance of Sequoia National Park at a 6,200-foot elevation. It began operating in April 1987. The site demonstrates the hourly ozone (SPM) response in a rural area. The site also monitors meteorology. On summer days, ozone and

precursors can be transported to Ash Mountain from other locations. At this location, there are significantly lower hourly emissions of NOx as compared to urban areas such as Bakersfield, or Fresno, CA. The amount of available NOx at Lower Kaweah to scavenge the ozone is much lower. Because the ozone scavenging at Lower Kaweah is much less than the ozone scavenging in urban areas, Lower Kaweah can experience elevated ozone concentrations for a 24-hour period during ozone episodes. Since the ozone concentration is already fairly high at dawn, only a relatively small amount of additional ozone can cause levels in the atmosphere to exceed federal standards.

Other Sites

Santa Rosa Rancheria

Santa Rosa Rancheria is Tribal land located in the central portion of the San Joaquin Valley in Lemoore, CA. It is 13 miles southwest of Hanford, CA and 39 miles south of the Fresno, CA metropolitan area. The Diablo Mountain Range is approximately 27 miles east of Santa Rosa Rancheria. North-south air flow is virtually unobstructed. Pollutants occur locally and wind transports pollutants into and through the site from nearby and upwind urban areas as well. The Santa Rosa Rancheria monitoring site is operated by the Tachi-Yokut tribe. It began operating in August 2006. The purpose of the site is to monitor representative concentrations of hourly ozone (SPM) and PM10 responses from upwind and nearby urban areas. During the summer months, high temperatures and longer daylight hours contribute to increases in ozone during the day. In contrast, ozone concentrations decrease at night with the absence of sunlight and the presence of NOx pollutants which scavenge the ozone. On rare occasions, this area of the San Joaquin Valley experiences wind events that can carry dust into the area or lift local dust particles into the air. Such events can cause PM10 concentrations to increase.

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