BAY AREA AIR QUALITY MANAGEMENT DISTRICT

2014 Air Monitoring Network Plan

July 1, 2015

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Definition of Terms

1:1 ..... Particulate or toxic sample schedule that is taken every day
1:3 ..... Particulate or toxic sample schedule that is taken every 3rd day
1:6 ..... Particulate or toxic sample schedule that is taken every 6th day
1:12 ..... Particulate or toxic sample schedule that is taken every 12th day
ADT ..... Average Daily Traffic
AADT ..... Annual Average Daily Traffic
AGL ..... Above Ground Level
AQS ..... Air Quality System; the EPA national air quality database
ARM ..... Approved Regional Method
Air District ..... Bay Area Air Quality Management District
BAM ..... Beta Attenuation Monitor, a type of continuous $PM_{2.5}$ monitor
BAAQMD ..... Bay Area Air Quality Management District
BC ..... Black Carbon
CARB ..... California Air Resources Board
CBSA ..... Core Based Statistical Area
CDP ..... Census Designated Place
CFR ..... Code of Federal Regulations
CO ..... Carbon Monoxide
CH_4 ..... Methane
CSN ..... Chemical Speciation Network
DOT ..... Department of Transportation
DRI ..... Desert Research Institute
EPA ..... U. S. Environmental Protection Agency
FE-AADT ..... Fleet Equivalent Annual Average Daily Traffic
FEM ..... Federal Equivalent Method
FRM ..... Federal Reference Method
GC ..... Gas Chromatograph
GCMS ..... Gas Chromatograph Mass Spectrometer
GPS ..... Geographic Positioning System
HC ..... Hydrocarbons, including CH_4 and NMHC
HiVol ..... High Volume
HPLC ..... High Performance Liquid Chromatograph
H_2S ..... Hydrogen Sulfide
ICPMS ..... Inductively Coupled Plasma Mass Spectrometry
IMPROVE ..... Interagency Monitoring of Protected Visual Environments
Maintenance Plan ..... A Plan submitted by states to EPA that outlines how the NAAQS will be maintained for a particular region.
NAAQS ..... National Ambient Air Quality Standard
NATTS ..... National Air Toxics Trends Station
NCore ..... National Core (Monitoring Program)
NEI ..... National Emissions Inventory
NMHC ..... Non-methane Hydrocarbons
NO ..... Nitric Oxide
NO_2 ..... Nitrogen Dioxide

Definition of Terms (continued)

NO_x ..... Oxides of Nitrogen
NO_y ..... Total Reactive Nitrogen
NSR ..... New Source Review
O_3 ..... Ozone
PAMS ..... Photochemical Assessment Monitoring Stations\
Pb ..... Lead
PPB ..... Parts per billion
PM ..... Particulate Matter
$PM_{2.5}$ ..... Particulates less than or equal to 2.5 microns in size
$PM_{2.5F}$ ..... $PM_{2.5}$ measured using a filter-based sampler
$PM_{2.5C}$ ..... $PM_{2.5}$ measured using a continuous monitor
PM_{10} ..... Particulates less than or equal to 10 microns in size
PM_{10C} ..... PM_{10} measured using a continuous monitor
$PM_{10-2.5}$ ..... PM Coarse - PM less than or equal to 10 microns and greater than 2.5 microns in size
POC ..... Parameter Occurrence Code
PWEI ..... Population Weighted Emissions Index
SIP ..... State Implementation Plan – A Plan submitted by states to EPA that outlines how the NAAQS will be met for a particular region
SLAMS ..... State or Local Air Monitoring Station
SO_2 ..... Sulfur Dioxide
SPM ..... Special Purpose Monitor
STN ..... Speciation Trends Network
TAMS ..... Total Atmospheric Mercury
TSP ..... Total Suspended Particulate
UFP ..... Ultrafine Particulate less than or equal to 0.1 microns
VOC ..... Volatile Organic Compound

Introduction

This annual network plan for the Bay Area Air Quality Management District summarizes the air monitoring activities between January 1, 2014 and December 31, 2014. The detailed information about the instruments used at each air monitoring site pertain to the status as of December 31, 2014. There are also siting and local area descriptions for monitoring sites that operated in 2014 and for those which opened, or were planned to open, between January 1 and June 30, 2015.

Overview of Network Operation

Network Design

The Bay Area Air Quality Management District (Air District) is the public agency responsible for air quality management in the nine Bay Area counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma. The Air District operates air monitoring stations in each of these nine counties. The Air District began measuring air quality in the San Francisco Bay Area in 1957. In 2014 there were 32 air monitoring stations in operation within the Air District (one site, San Carlos Airport was temporarily shut down and is not included in this total).

The Air District also performs air monitoring as part of other programs. These include programs that the Air District has initiated, such as meteorological monitoring and the ambient toxics program, and programs required by EPA. EPA programs currently include the National Air Toxics Trends Stations (NATTS) Program, the National Core (NCore) program, the Photochemical Assessment Monitoring Stations (PAMS) program, and the $PM_{2.5}$ Chemical Speciation Network (CSN). Summaries of these programs can be found later in this report.

The San Francisco Bay Area contains over 100 cities. Although resources do not allow placement of air pollution monitors in every city, it can be demonstrated that air pollution levels, in the absence of significant local sources, are similar within each geographical region of the Bay Area. That is, cities within each of the major valleys of the Bay Area can have similar air quality levels. Consequently, a few sites can characterize an area. Generally, locations for permanent air monitoring sites are initially based on knowledge of population density and local wind patterns, while the final site selection is determined after analyzing preliminary air quality measurements collected from field studies, temporary monitoring studies, and mobile monitoring data.

The monitoring objectives of the Air District's air monitoring network are:

- To provide air pollution data to the general public in a timely manner.
- To support compliance with California and national ambient air quality standards. When sites do not meet the standards, attainment plans are developed to attain the standards.
- To support air pollution research studies.

To meet its monitoring objectives the Air District collects ambient air data at locations with a variety of monitoring site types. These site types, as defined in 40 CFR Part 58, Appendix D, Table D-1 are listed below:

Extreme downwind: Sites established to characterize the extreme downwind transported ozone and its precursor concentrations, located in the predominant afternoon downwind direction from the local area of maximum precursor emissions. This site type is only used at sites designated as PAMS or unofficial PAMS.

Highest concentration: Sites expected to have the highest concentration, even if populations are sparse in that area. High concentrations may be found close to major sources, or further downwind if pollutants are emitted from tall stacks. High concentrations may also be found at distant downwind locations when the pollutants such as ozone or secondary particulate matter are a result of chemical reactions in the atmosphere.

Maximum ozone concentration: Sites intended to monitor maximum ozone concentrations occurring downwind from the area of maximum precursor emissions. Locations should be chosen so that urban scale measurements are obtained. Typically, these sites are located 10 to 30 miles from the fringe of the urban area. This site type is only used at sites designated as PAMS or unofficial PAMS.

Maximum precursor impact: Sites established to monitor the magnitude and type of precursor emissions in the area where maximum precursor emissions are representative of the CBSA are expected to impact and are suited for the monitoring of urban air toxic pollutants. This site type is only used at sites designated as PAMS or unofficial PAMS.

Population exposure: Sites in areas with high population density to evaluate exposure to air pollution. In most cases, stations are located within the largest cities in each county. Because people spend more time at home than at work, air monitoring sites are generally located in residential areas rather than at downtown locations.

Source oriented: Sites in areas downwind of potential major sources of pollutants. In the Bay Area, there are five refineries that are potential pollutant sources: Chevron, Shell, Tesoro, Phillips 66, and Valero. The Port of Oakland also can be a significant source of particulates, CO, and toxics. General aviation airports can be sources of lead because piston engine aircraft continue to use leaded fuel.

Upwind background: Sites in areas that have no significant emissions from mobile, area, or industrial sources. At these sites, the measured concentrations reflect the transported air quality levels from upwind areas. This site type is only used at sites designated as PAMS or unofficial PAMS.

General Background: Where there are no significant emission sources upwind of a site, then the site is considered to be a general background site.

Regional Transport: The Air District shares a common boundary with six other air districts: Monterey Bay Unified APCD, San Joaquin Valley APCD, Sacramento Metropolitan AQMD, Yolo-Solano AQMD, Lake County AQMD, and Northern Sonoma County APCD. When upwind areas have significant air pollution sources, pollutants may be transported into the Bay Area Air District and result in overall higher air pollution levels in the Bay Area. The Air District operates monitoring stations near the borders of the Air District to measure the air pollution concentrations transported into and out of the Bay Area Air District.

Welfare-related impacts: Sites located to measure impacts on visibility, vegetative damage, or other welfare-based impacts.

Quality Assurance: Sites where dual or collocated instruments are maintained to confirm that the primary instruments are providing accurate data.

Each site type is associated with a spatial scale. For example, a regional transport site is meant to represent air quality levels over a large area, while a highest concentration site may represent a spatial scale of no more than a few blocks or so, in size. Spatial scales are defined in 40 CFR, Part 58, Appendix D. They are: micro scale – having dimensions of several meters up to 100 meters; middle scale – having dimensions of 100 meters to 0.5 km; neighborhood scale – having dimensions of 0.5 km to 4.0 km; urban scale – having dimensions of 4 to 50 km; and regional scale – having dimensions of up to hundreds of km. Table 1 lists the appropriate scales for each site type.

Table 1. SLAMS Site Types and Appropriate Spatial Scales.

Site Type	Appropriate Spatial Scale
1. Highest Concentration	Micro, middle, neighborhood
2. Population Exposure	Neighborhood, urban
3. Source Oriented	Micro, middle, neighborhood
4. General Background	Urban, regional
5. Regional Transport	Urban, regional

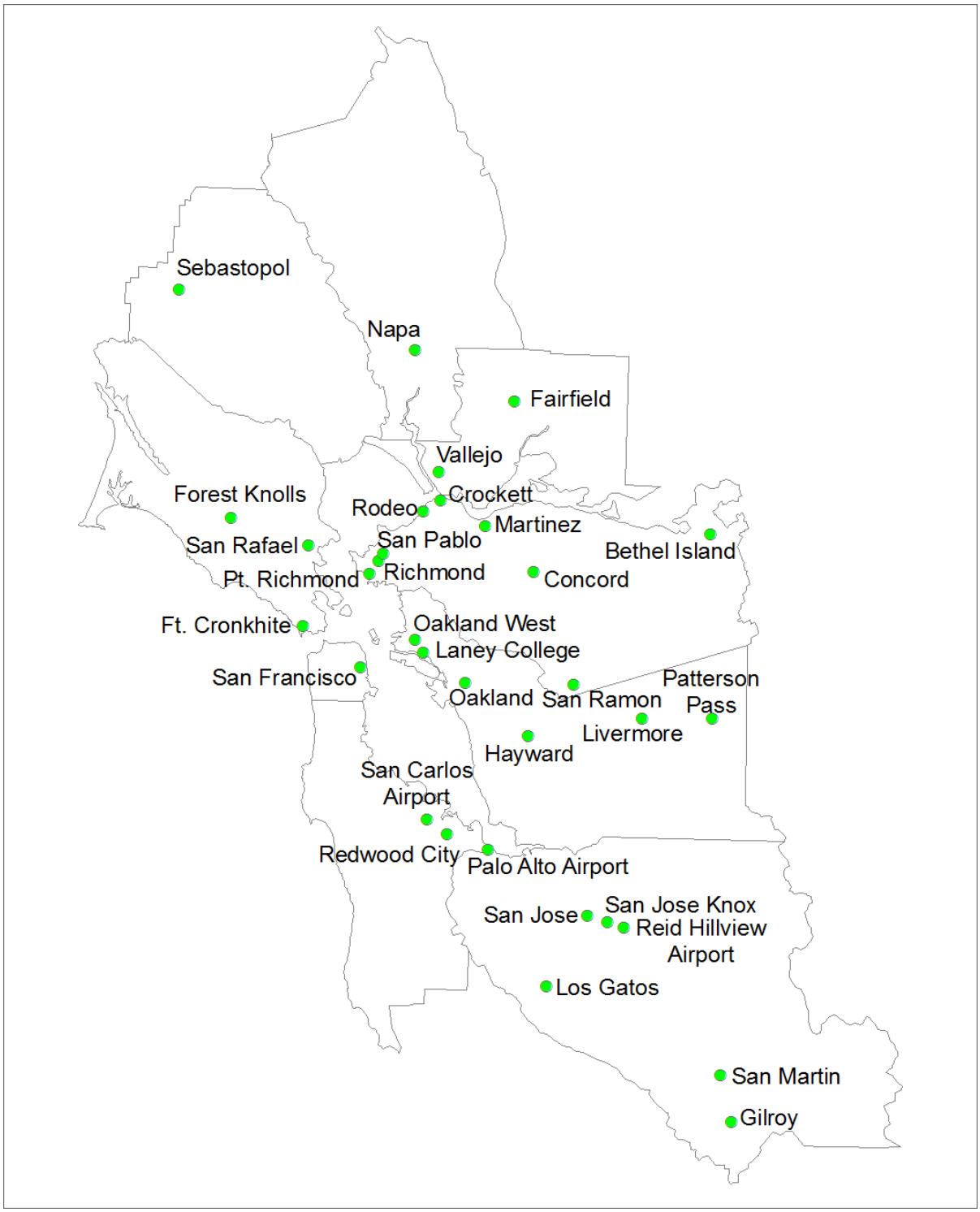
The spatial scale of a monitor must conform to established criteria for the distance from roadways, based on traffic volumes. There are different distance requirements for each pollutant, which can be found in 40 CFR Part 58, Appendix E. Table 2 lists the stations and the pollutants measured at each site and Figure 1 is a map of the monitoring sites in 2014.

Table 2. List of Monitoring Stations within the Air District in 2014

Site	Station Name	Pollutants Monitored[1]
1	Bethel Island	O_3, NO_x, SO_2, CO, PM_{10}, Toxics
2	Concord	O_3, NO_x, SO_2, CO, PM_{10}, $PM_{2.5\ C}$, Toxics
3	Crockett	SO_2, Toxics
4	Fairfield	O_3
5	Forest Knolls	BC
6	Fort Cronkhite	Toxics
7	Gilroy	O_3, $PM_{2.5C}$
8	Hayward	O_3
9	Laney College (near-road)	NO_x, SO_2, CO, $PM_{2.5C,}$ Toxics, BC, UFP
10	Livermore	O_3, NO_x, HC, $PM_{2.5C}$, Speciated $PM_{2.5}$, Toxics, BC, UFP
11	Los Gatos	O_3
12	Martinez	SO_2, Toxics
13	Napa	O_3, NO_x, CO, PM_{10}, $PM_{2.5C}$, Toxics
14	Oakland	O_3, NO_x, $CO_,$ $PM_{2.5C}$, Toxics
15	Oakland West	O_3, NO_x, SO_2, CO, $PM_{2.5C,}$ Speciated $PM_{2.5}$, Toxics, BC
16	Palo Alto Airport	Lead (TSP)
17	Patterson Pass	NO_x
18	Point Richmond	H_2S
19	Redwood City	O_3, NO_x, CO, $PM_{2.5F}$, $PM_{2.5C}$, Toxics, UFP
20	Redwood City -Twin Dolphin	Lead (PM10)
21	Reid-Hillview Airport	Lead (TSP)
22	Richmond 7th	SO_2, H_2S, Toxics
23	Rodeo	H_2S
24	San Carlos Airport I & II	Lead (TSP) [both sites inoperative in 2014]
25	San Francisco	O_3, NO_x, CO, PM_{10}, $PM_{2.5C}$, Toxics
26	San Jose	O_3, NO_x, NO_y, SO_2, CO, PM_{10}, $PM_{2.5F}$, $PM_{2.5C}$, Speciated $PM_{2.5,}$ Toxics, Lead (PM_{10})
27	San Jose Knox Ave (near-road)	NO_x, SO_2, CO, $PM_{2.5C,}$ Toxics, BC, UFP
28	San Martin	O_3
29	San Pablo	O_3, NO_x, SO_2, CO, PM_{10}, $PM_{2.5\ C}$, Toxics, UFP
30	San Rafael	O_3, NO_x, CO, PM_{10}, $PM_{2.5C}$, Toxics
31	San Ramon	O_3, NO_x
32	Sebastopol	O_3, NO_x, CO, $PM_{2.5C}$, Toxics, UFP
33	Vallejo	O_3, NO_x, SO_2, CO, $PM_{2.5C}$, Speciated $PM_{2.5}$, Toxics

[1] See pages 6 and 7 for acronym definitions.

Figure 1. Map of Bay Area SLAMS and SPM Sites in 2014

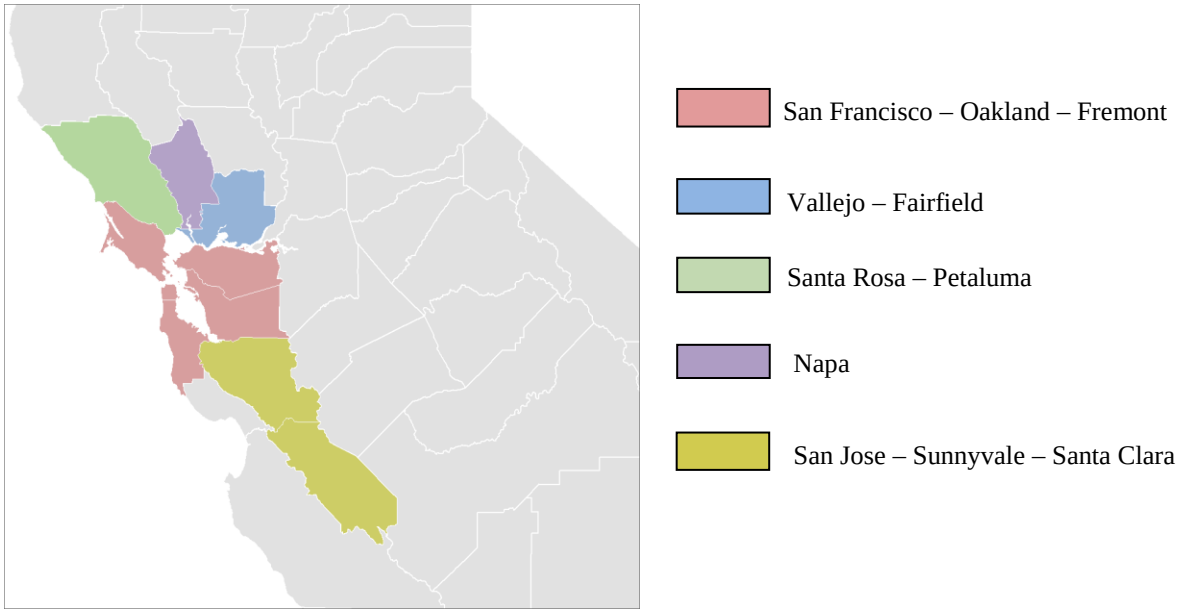


Minimum Monitoring Requirements

The Air District met or exceeded all minimum monitoring requirements for criteria pollutants in 2014. During the past three years, no exceptional event designations were requested by the Air District. Therefore, design values listed in the tables of this section have not been adjusted for exceptional events. In the Bay Area, exceptional events would generally be restricted to wildfires or industrial accidents that contribute to exceedances of the NAAQS.

EPA minimum monitoring requirements are not based on the Air District boundary. Instead, they are based on Core Based Statistical Areas (CBSA) or Metropolitan Statistical Areas (MSA) which are essentially identical for the Bay Area. Therefore, some monitors listed in the tables which follow are counted toward the minimum monitoring requirements even though the monitor is located in another Air District. CBSA boundaries for the Bay Area are shown in Figure 2.

Figure 2. Core Based Statistical Areas (CBSA) for the San Francisco Bay Area.



Monitoring Agreements with Yolo/Solano and Northern Sonoma Air Districts

The Bay Area network meets all minimum monitoring requirements for all criteria pollutants in the Santa Rosa – Petaluma CBSA and the Vallejo – Fairfield CBSA. Therefore, no interagency agreements are needed with these Air Districts.

Monitoring Agreements with Monterey Air District

The Bay Area and Monterey Air Districts share minimum monitoring requirements for the San Jose–Sunnyvale–Santa Clara CBSA. This CBSA includes Santa Clara County (Bay Area) and San Benito County (Monterey). Shared pollutant monitoring agreements include $PM_{2.5}$/PM_{10}, ozone and near-road NO_2, CO, and $PM_{2.5}$.

Within its own network, the Bay Area Air District meets $PM_{2.5}$, ozone and all near-road NO_2, CO, and $PM_{2.5}$ minimum monitoring requirements. PM_{10} is the only pollutant that the Bay

Area does not meet the minimum requirements on its own, and therefore has a monitoring agreement with Monterey Bay for PM_{10}. Monterey Bay needs agreements for ozone, $PM_{2.5}$, and near-road NO_2 and CO monitoring. Existing agreements are in Appendix B (ozone), Appendix C (PM_{10}), Appendix D (NO_2), and Appendix E (near-road CO, NO_2, and $PM_{2.5}$).

Minimum Monitoring Requirements for Ozone

The number of required ozone monitors in each CBSA is determined by the CBSA population and design value, as specified in Table D-2 of 40 CFR Part 58, Appendix D. Ozone design values are calculated[a] for each site and are compared to the national standard to determine the attainment status of an area.

Table 3 shows that the Air District monitoring network meets or exceeds the ozone minimum monitoring requirements. Therefore, no monitoring agreement is needed between the Bay Area Air Quality Management District and any other Air District to comply with the minimum monitoring requirement for ozone.

On July 20, 2012 the EPA's final designation for the 2008 National 8-hour ozone standard for the Bay Area was "nonattainment" with an area classification of "marginal". Updated design values based on the last 3 years of data (2012-2014) show that ozone is now in attainment; however, the Bay Area will continue to be designated as "non-attainment" for the national 8-hour ozone standard until the Air District submits a redesignation request and a maintenance plan to the EPA and the EPA approves the redesignation. No additional monitors are required in the State Implementation Plan (SIP) or Maintenance Plan for ozone.

A map of ozone monitoring locations in the San Francisco Bay Area for 2014 is shown in Figure 3. In 2014 the Sebastopol site replaced the Santa Rosa site as the maximum ozone site within the Bay Area portion of the Santa Rosa – Petaluma CBSA.

Table 3. Minimum Monitoring Requirements for Ozone.

CBSA	County or Counties	Pop. 2010 Census	8-hour Design Value[a] (ppb) 2014	Design Value Site & AQS ID	Required SLAMS Sites	Active SLAMS Sites	Additional SLAMS Sites Needed
San Francisco-Oakland-Fremont	SF, Marin, Alameda, San Mateo, Contra Costa	4,335,391	72	Livermore 060010007	3	7	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	70	San Martin 060852006 & Pinnacles 060690003	2	6[b]	0
Santa Rosa-Petaluma	Sonoma	483,878	58	Healdsburg 060971003	1	2[c]	0
Vallejo-Fairfield	Solano	413,344	66	Vacaville 060953003	2	3[d]	0
Napa	Napa	136,484	58[e]	Napa 060550003	0[e]	1	0

a Design values are calculated at each monitoring site by taking the 3-year mean (2012-2014) of the 4th highest 8-hour concentration. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the 0.075 ppm National Ambient Air Quality 8-hour Ozone Standard meet the standard.

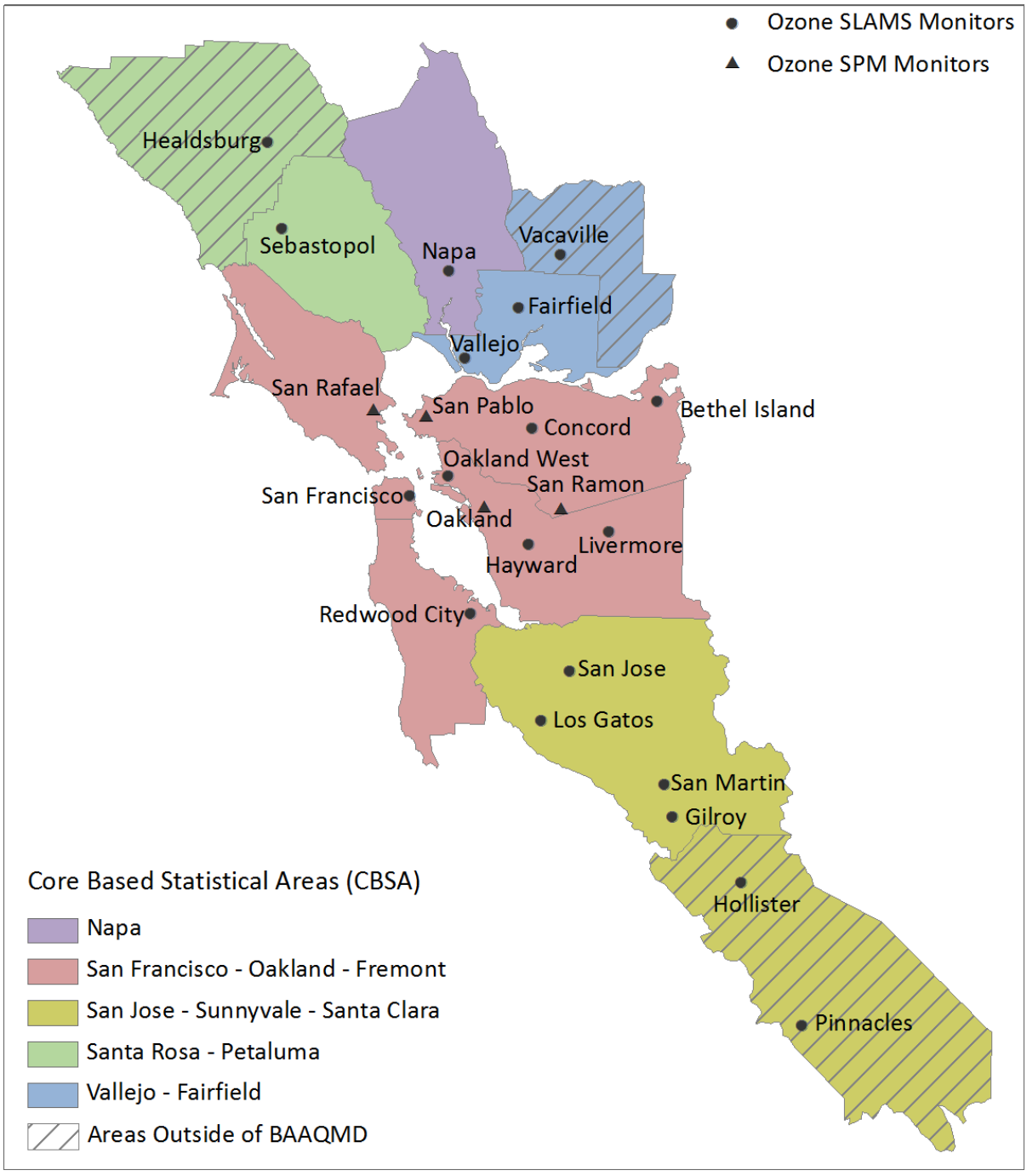
b Two of the six monitors are not in the BAAQMD. They are in Hollister and Pinnacles National Park which are in the Monterey Bay Unified Air Pollution Control District. The Pinnacles monitor is part of the CASTNET program and was designated SLAMS in 2010 by the EPA.

c One of the two monitors is not in the BAAQMD. It is in Healdsburg which is in the Northern Sonoma County Air Pollution Control District.

d One of the three monitors is not in the BAAQMD. It is in Vacaville which is in the Yolo-Solano Air Quality Management District.

e EPA Region 9 analysis of this site showed that the design value would increase by 2 ppb if this site was classified as neighborhood scale instead of middle scale. However, the required number of SLAMS monitors would be unchanged (zero) for the Napa CBSA.

Figure 3. Ozone monitoring in the San Francisco Bay Area in 2014



Ozone Monitoring Season Waivers and Waiver Request

From January through March 2014, and in December 2014, the following six sites did not measure ozone: Fairfield, Gilroy, Hayward, Los Gatos, San Martin, and San Ramon. Monitoring waivers in accordance with 40 CFR, Part 58, Appendix D, Section 4.1 are in Appendix A. A waiver was not required to discontinue ozone monitoring at San Ramon

because it is a Special Purpose Monitor (SPM). However, the Air District included San Ramon in its waiver request for transparency and completeness.

The BAAQMD requests a similar waiver for the period December 1, 2015 through March 31, 2016 for ozone monitoring at Fairfield, Gilroy, Hayward, San Martin, and Los Gatos. The Air District does not intend to operate the SPM ozone monitor at San Ramon during this period as well. During the waiver period December 2014 through March 2015, the 14 ozone monitors (non-waiver) recorded no national exceedances as shown in Table 4 below. Additionally, the highest 8-hour concentration of the 14 operating sites was 30% below the NAAQS. Finally, there have been no ozone exceedances at non-waiver sites for the past five years during the Dec-Mar period.

Table 4. Ozone concentrations and design values.

Site Name	AQS ID	4th highest 8-hour average O3 Conc. 2014 Apr-Nov (ppb)	Design Value 2012-14 (ppb)	Non-Waiver Sites 1st highest 8-hour average O3 Conc. entire Bay Area (ppb)	
				Jan-Mar 2014	Dec 2014
Hayward	06-001-2001	72	61	50	43
Gilroy	06-085-0002	71	66		
Los Gatos	06-085-1001	69	64		
San Martin	06-085-2006	73	70		
Fairfield	06-095-0005	63	63		

Napa Ozone Spatial Scale, Waiver Request

The Napa ozone monitor is classified as middle scale based on the nearby traffic count and distance between the monitor and the roadway (per 40 CFR Part 58). An Air District analysis concluded that recorded ozone levels at Napa are not appreciably affected by NO_2 emissions from the nearest roadway. Subsequently, the Air District applied for a waiver from EPA Region 9.

In response to this request, EPA used a conservative approach to estimate how much ozone is decreased due to NO_2 emitted from nearby roadways. Based on this analysis, EPA concluded that the Napa ozone design value would increase by 2 ppb if the monitor were far enough away from the roadway to meet EPA siting criteria. Therefore, EPA Region 9 granted the waiver and stated that the waiver was automatically extended each year with the demonstration that the design value is not within 5 ppb of any applicable NAAQS. The BAAQMD hereby requests a renewal of the originally granted April 2013 Appendix E spacing from roadway siting waiver for the Napa ozone monitor, based on a 2012-2014 design value of 58 ppb.

Minimum Monitoring Requirements for $PM_{2.5}$

The number of required $PM_{2.5}$ monitors in each CBSA is determined by the CBSA population and design value, as specified in Table D-5 of Appendix D to 40 CFR Part 58. All SLAMS $PM_{2.5}$ and continuous SLAMS $PM_{2.5}$ monitoring locations are shown in Figure 6 and Figure 7, respectively. Table 5 shows that the $PM_{2.5}$ minimum monitoring requirements were met in 2014. In 2014, every $PM_{2.5}$ monitor in the network was a FRM or FEM, and every primary monitor was a continuous FEM. Data collected in 2014 through April 2015 shows Laney College and San Jose Knox Avenue near-road micro-scale $PM_{2.5}$ monitors to be representative of area-wide air quality, and therefore contribute to minimum monitoring requirements. Figure 4 shows scatter plots of $PM_{2.5}$ data for Oakland Laney College vs Oakland West and San Jose Knox vs San Jose Jackson, respectively.

Figure 4. Scatter plot of $PM_{2.5}$ data for Laney College vs Oakland West

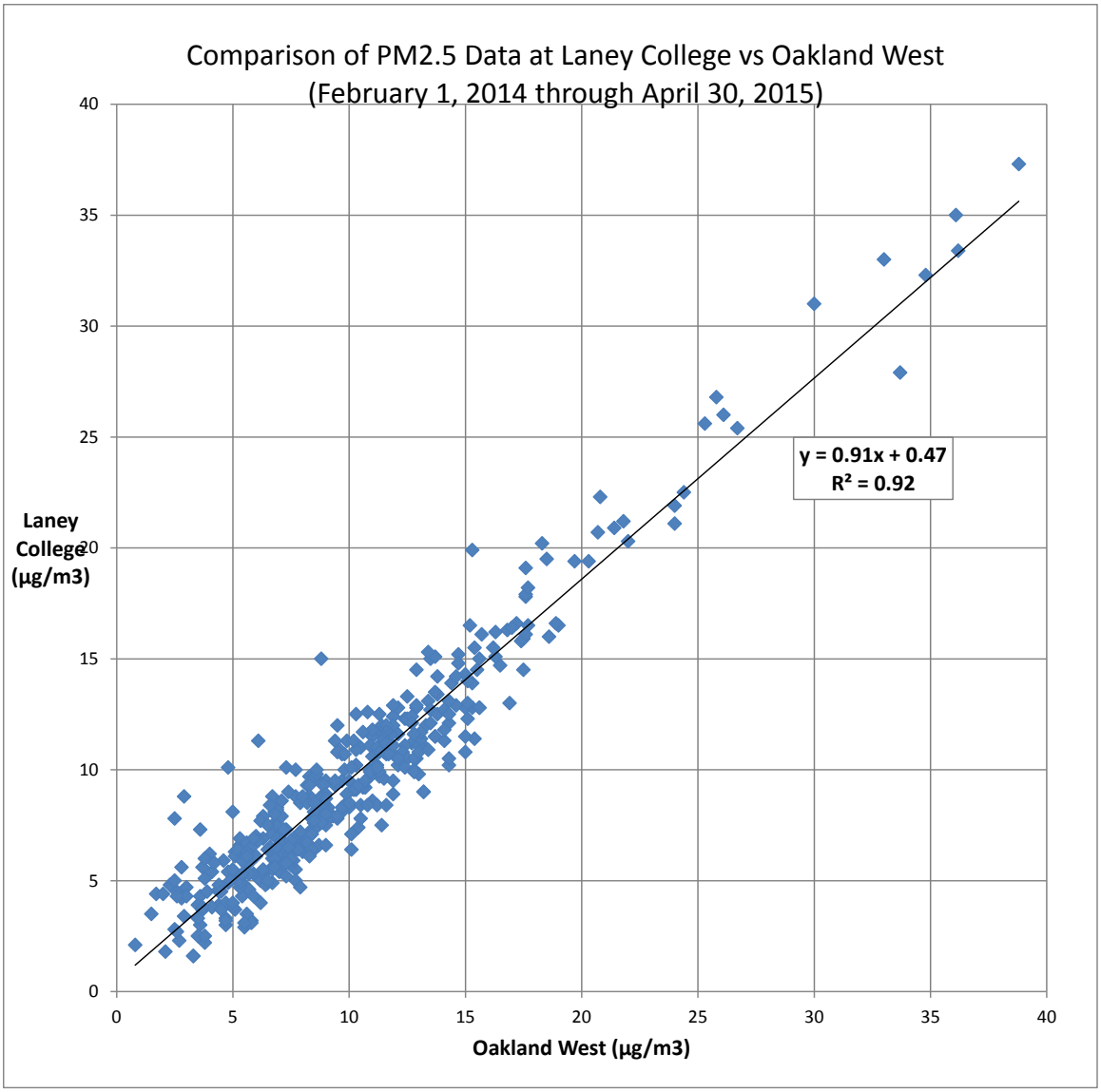
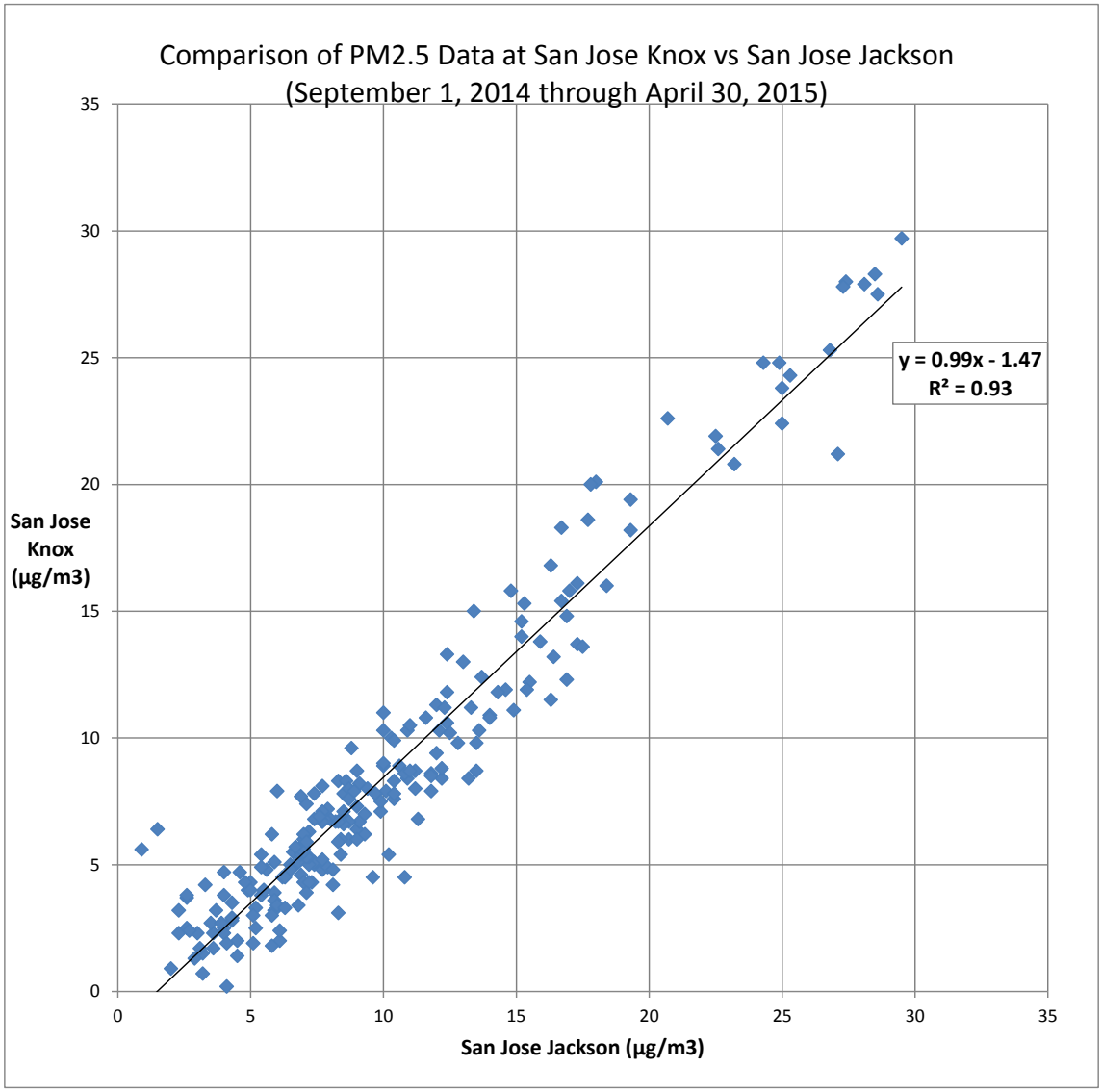


Figure 5. Scatter plot of $PM_{2.5}$ data for San Jose Knox vs San Jose Jackson



The Bay Area Air Quality Management District does not need any monitoring agreements with the Monterey Bay Air Pollution Control District for $PM_{2.5}$ because the Bay Area meets the requirements with its own network. This is a change from previous years when such an agreement was needed to meet the requirements. In 2014, the San Jose Knox monitor became operational, making the previous agreement unneeded. Additionally, there are no monitoring agreements with the Northern Sonoma Air District because the Santa Rosa – Petaluma CBSA is not required to have any $PM_{2.5}$ monitors. There are no monitoring agreements with the Yolo-Solano Air District because the Vallejo – Fairfield CBSA is not required to have any $PM_{2.5}$ monitors. No additional monitors are required for the State Implementation Plan or Maintenance Plans.

There are additional minimum monitoring requirements for $PM_{2.5}$ in 40 CFR Part 58. One is to operate continuous $PM_{2.5}$ monitors equal to at least one-half (round up) the number of

$PM_{2.5}$ SLAMS monitors. Table 6 shows that the Air District network met this requirement in 2014. Another requirement is for collocation of monitors depending on the number of FRM or FEMs deployed in the air monitoring network. This requirement is discussed on page 25. There are other requirements related to collocation of $PM_{2.5}$ monitors at near-road monitoring sites which is also discussed on page 25.

$PM_{2.5}$ Filter Analysis for other Air Districts and PQAO Responsibility

Because the Air District has a fully staffed professional Laboratory Services Section, $PM_{2.5}$ filter samples collected by the North Coast and Monterey Bay Air Districts are weighed in the Air District's laboratory by Air District staff. The $PM_{2.5}$ concentrations are sent back to the collecting Air Districts for their review, Quality Assurance, and certification. The Bay Area Air District is not the Primary Quality Assurance Organization (PQAO) for these samples. The Bay Area Air Quality Management District is the certifying agency for samples collected within the Bay Area only.

State Implementation Plan (SIP) Requirements

EPA designated the Bay Area as nonattainment of the $PM_{2.5}$ standard on October 8, 2009. The effective date of the designation was December 14, 2009 and the Air District had three years to develop a State Implementation Plan (SIP) to demonstrate that the Bay Area will achieve the revised standard by December 14, 2014. However, in October 2012, EPA proposed to suspend the SIP requirements after making a Clean Data Determination, as described below.

Clean Data Determination by US EPA

On October 29, 2012, EPA issued proposed rule-making to determine that the Bay Area is attaining the 24-hour $PM_{2.5}$ national standard. When the proposed rule is finalized, key SIP requirements to demonstrate how the Bay Area will achieve the standard will be suspended as long as monitoring data continues to show that the Bay Area attains the $PM_{2.5}$ standard.

The Bay Area will continue to be designated as "non-attainment" for the national 24-hour $PM_{2.5}$ standard until the Air District elects to submit a redesignation request and a maintenance plan to the EPA, and EPA approves the proposed redesignation. Although most SIP requirements may be suspended, the Bay area will still be required to prepare an abbreviated SIP submittal to address the required elements, including:

- An emission inventory for primary $PM_{2.5}$, as well as precursor pollutants that contribute to formation of secondary PM; and
- Amendments to the Air District's New Source Review (NSR) to address $PM_{2.5}$ (as well as other revisions). Amendments to the NSR were adopted by the Air District's Board of Director's on December 19, 2012.

Figure 6. SLAMS $PM_{2.5}$ monitoring in the San Francisco Bay Area in 2014

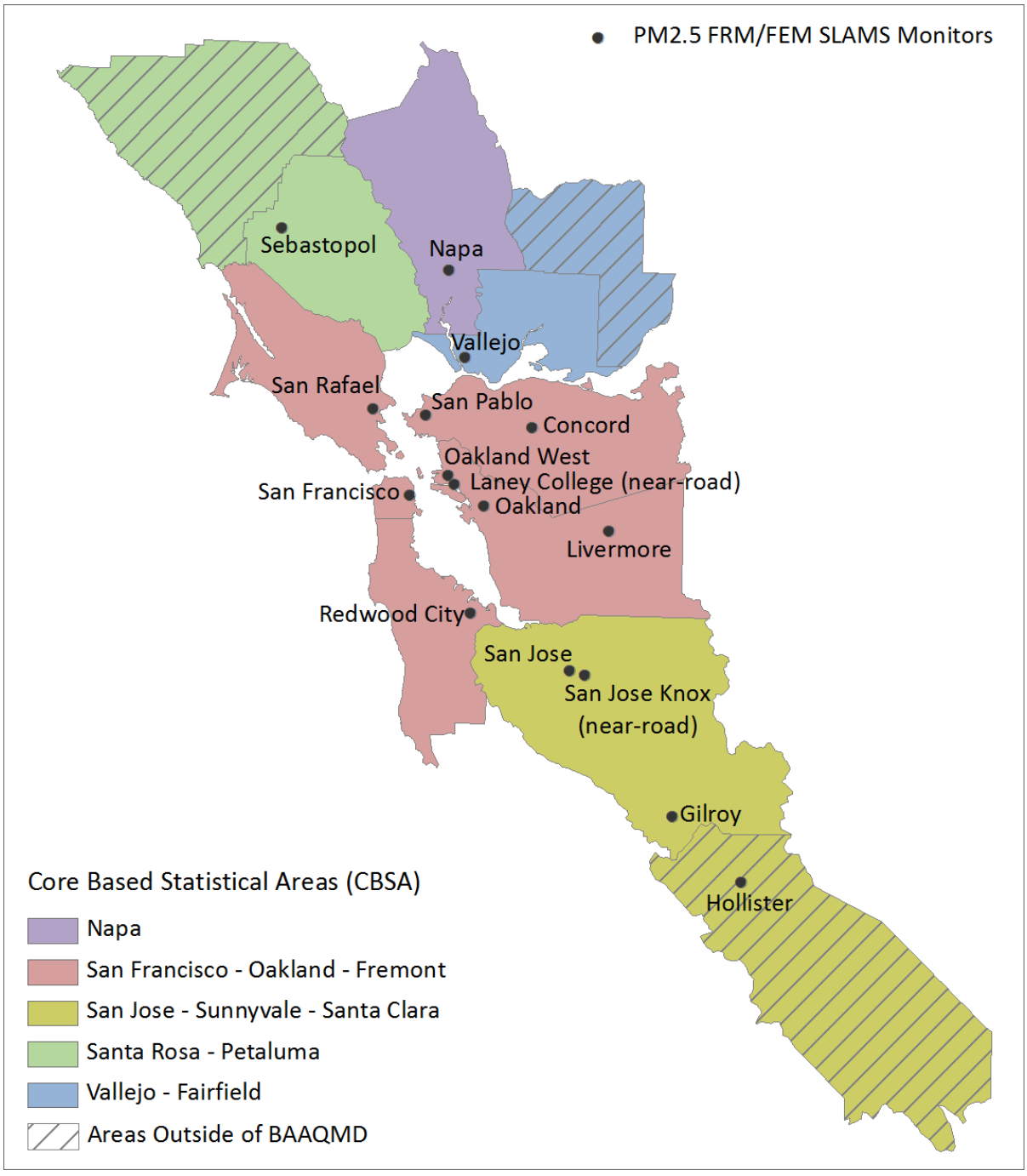
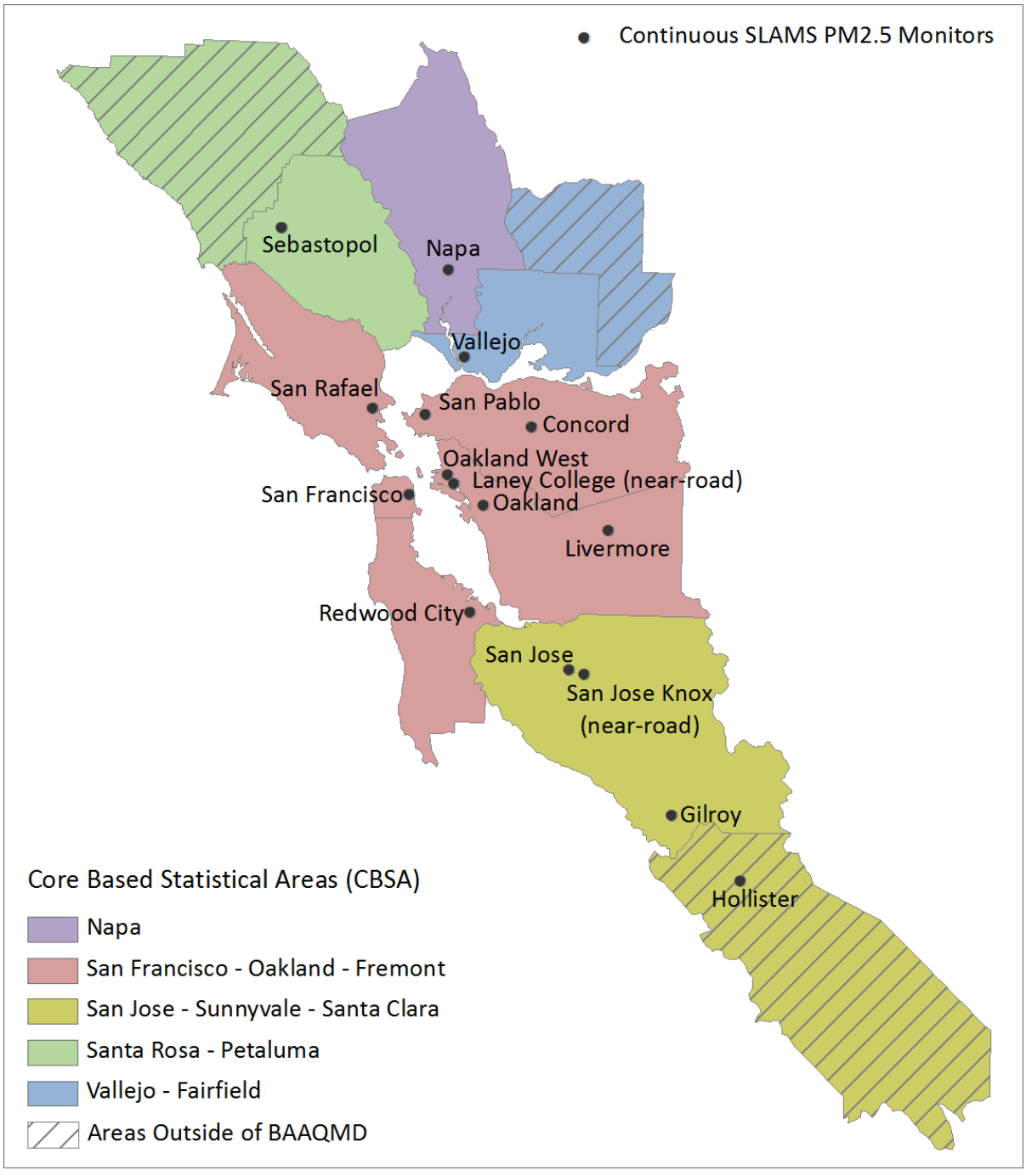


Figure 7. Continuous SLAMS $PM_{2.5}$ monitoring in the San Francisco Bay Area in 2014



The sites shown above met minimum continuous $PM_{2.5}$ monitoring requirements for calendar year 2014.

Table 5. Minimum Monitoring Requirements for FRM/FEM $PM_{2.5}$ SLAMS in 2014

CBSA	County or Counties	Pop. 2010 Census	Annual Design Value[a] ($\mu g/m^3$) 2012-14	Annual Design Value site & AQS ID	Daily Design Value[b] ($\mu g/m^3$) 2012-14	Daily Design Value site & AQS ID	Required SLAMS Sites	Active SLAMS Sites	Additional SLAMS Sites Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	9.8	San Rafael 060410001	27	Livermore 060010007	2	9[c]	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	10.0	San Jose 060850005	30	San Jose 060850005	3	4[d]	0
Santa Rosa-Petaluma	Sonoma	483,878	N/A[e]	N/A[e]	N/A[e]	N/A[e]	0	1	0
Vallejo-Fairfield	Solano	413,344	9.6	Vallejo 060950004	26	Vallejo 060950004	0	1	0
Napa	Napa	136,484	N/A[f]	N/A[f]	N/A[f]	N/A[f]	0	1	0

a Annual design values are calculated at each monitoring site by taking the 3-year mean (2012-2014) of the annual averages for each site. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national $PM_{2.5}$ annual standard of 12.0$\mu g/m^3$ indicate the area meets the standard.

b Daily design values are calculated by taking the 3-year mean (2012-2014) of the 98th percentiles for each site. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national $PM_{2.5}$ 24-hour standard of 35$\mu g/m^3$ indicate the area meets the standard.

c One of the nine monitors, Laney College, is near-road and classified as micro spatial scale. However, 24-hour average $PM_{2.5}$ data at Laney College compared to Oakland West (neighborhood scale and area-wide) show a slope of 0.91 and R2 of 0.92, indicating that data from the two sites are very similar. Thus, Laney College is also considered an area-wide site and can be counted toward meeting the area-wide requirement.

d One of the four monitors, San Jose Knox, is near-road and classified as micro spatial scale. However, 24-hour average $PM_{2.5}$ data at San Jose Knox compared to San Jose Jackson (neighborhood scale and area-wide) show a slope of 0.99 and R2 of 0.93, indicating that data from the two sites are very similar. Thus, San Jose Knox is also considered an area-wide site and can be counted toward meeting the area-wide requirement. Additionally, one of the four monitors is not in the BAAQMD. It is in Hollister which is in the Monterey Bay Unified Air Pollution Control District.

e There were no FRM or FEM $PM_{2.5}$ monitors that were continuously running during 2012-2014 in Sonoma County, therefore there are no annual or daily design values. Santa Rosa air monitoring site closed December 2013. In January 2014, a new air monitoring site opened at Sebastopol site and replaced the Santa Rosa site.

f There were no FRM or FEM $PM_{2.5}$ monitors in Napa County until December 2012, therefore there are no annual or daily design values.

Table 6. Minimum Monitoring Requirements for continuous SLAMS $PM_{2.5}$ in 2014.

CBSA	County or Counties	Pop. 2010 Census	Annual Design Value[a] ($\mu g/m^3$) 2012-14	Annual Design Value site & AQS ID	Daily Design Value[b] ($\mu g/m^3$) 2012-14	Daily Design Value site & AQS ID	Required Continuous Monitors	Active Continuous Monitors	Additional Continuous Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	9.8	San Rafael 060410001	27	Livermore 060010007	1	9[c]	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	10.0	San Jose 060850005	30	San Jose 060850005	2	4[d]	0
Santa Rosa-Petaluma	Sonoma	483,878	N/A[e]	N/A[e]	N/A[e]	N/A[e]	0	1	0
Vallejo-Fairfield	Solano	413,344	9.6	Vallejo 060950004	26	Vallejo 060950004	0	1	0
Napa	Napa	136,484	N/A[f]	N/A[f]	N/A[f]	N/A[f]	0	1	0

a Annual design values are calculated at each monitoring site by taking the 3-year mean (2012-2014) of the annual averages for each site. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national $PM_{2.5}$ annual standard of 12.0$\mu g/m^3$ indicate the area meets the standard.

b Daily design values are calculated by taking the 3-year mean (2012-2014) of the 98th percentiles for each site. The design values shown for each CBSA in this table are the highest design value of monitors in the CBSA. Design values at or below the national $PM_{2.5}$ 24-hour standard of 35$\mu g/m^3$ indicate the area meets the standard.

c One of the nine monitors, Laney College, is near-road and classified as micro spatial scale. However, 24-hour average $PM_{2.5}$ data at Laney College compared to Oakland West (neighborhood scale and area-wide) show a slope of 0.91 and R2 of 0.92, indicating that data from the two sites are very similar. Thus, Laney College is also considered an area-wide site and can be counted toward meeting the area-wide requirement.

d One of the four monitors, San Jose Knox, is near-road and classified as micro spatial scale. However, 24-hour average $PM_{2.5}$ data at San Jose Knox compared to San Jose Jackson (neighborhood scale and area-wide) show a slope of 0.99 and R2 of 0.93, indicating that data from the two sites are very similar. Thus, San Jose Knox is also considered an area-wide site and can be counted toward meeting the area-wide requirement. Additionally, one of the four monitors is not in the BAAQMD. It is in Hollister which is in the Monterey Bay Unified Air Pollution Control District.

e There were no FRM or FEM $PM_{2.5}$ monitors that were continuously running during 2012-2014 in Sonoma County, therefore there are no annual or daily design values. Santa Rosa air monitoring site closed December 2013. In January 2014, a new air monitoring site opened at Sebastopol site and replaced the Santa Rosa site.

f There were no FRM or FEM $PM_{2.5}$ monitors in Napa County until December 2012, therefore there are no annual or daily design values.

Area of Expected Maximum Concentration
$PM_{2.5}$ concentrations can be highly impacted by localized residential wood burning which is not under the Air District's permitting authorities. These impacts can change at any given moment resulting in the maximum concentration changing from location to location. Studies in the area of western Marin County demonstrate that on some days, the maximum $PM_{2.5}$ concentration is where the San Rafael monitor is located.

The Air District believes the best approach to address wood smoke as a source category is to work with local stakeholders and partners (city governments, county governments, utility companies, and our Air District Board) to try and provide heat sources, other than wood, and to discourage the public from using wood as a heat source through education about the health impacts from wood smoke and replacing non-EPA certified wood burning devices with those which are EPA-certified.

Additionally, the Air District imposes wood burning restrictions during the high $PM_{2.5}$ season (November 1 to the end of February) in its Regulation 6, Rule 3. During the winter season, wood smoke is banned on days conducive to exceeding or approaching the national $PM_{2.5}$ standard. These days are declared as Winter Spare the Air (WSTA) days. In the winter of 2013-14 there were 30 WSTA days and in the winter of 2014-15 there were 23 WSTA days.

The Air District requests that EPA provide detailed guidance on how to meet the regulatory requirement describing the location of maximum concentration. Without this guidance, any measurement taken during wood burning that causes localized concentrations to exceed other monitoring locations could require that monitors either be added or moved.

Regional Background and Transport Sites
In the Bay Area, Vallejo and Livermore $PM_{2.5}$ air monitoring sites are located in areas that are frequently subject to regional transport. Due to geography and seasonal weather patterns, both of these sites are frequently downwind of the Sacramento and San Joaquin Valleys which are often heavily laden with particulates during winter (November-February). The Bay Area does not have a regional background site.

Minimum Monitoring Requirements for Collocated $PM_{2.5}$

Collocation requirements for $PM_{2.5}$ monitoring are based on the number of $PM_{2.5}$ monitors within a Primary Quality Assurance Organization (PQAO) by measurement method (FRM or FEM). The BAAQMD is its own PQAO so monitoring locations outside of the BAAQMD are not counted in the collocation requirements show in Table 7 and Table 8 below. In 2014, the Bay Area had no FRM (method 145) $PM_{2.5}$ monitors designated as the primary monitor. Therefore, no collocated FRM monitoring was required per 40 CFR 58 Appendix A.

Table 7. Collocated $PM_{2.5}$ monitors for FRM method 145 in 2014.

Method Code	# Primary Monitors	# Required Collocated Monitors	# Active Collocated FRM Monitors
145	None	0	0

In 2014, the Bay Area had 15 FEM (method 170) $PM_{2.5}$ monitors designated as the primary monitor. The Bay Area also operated two collocated $PM_{2.5}$ monitors, one in San Jose (a FEM primary and FRM collocated), and another in Vallejo (a FEM/FEM primary/collocated pair) in 2014 as shown in Table 8 below. 40 CFR 58 Appendix A requires collocation at 15% of the sites (round up) which equates to two collocated monitors, the first of which must be an FRM (met at San Jose) while half must be the same FEM method as the primary monitor (met at Vallejo).

Table 8. Collocated $PM_{2.5}$ monitors for FEM method 170 in 2014.

Method Code	# Primary Monitors	# Required Collocated Monitors	# Active Collocated FRM Monitors	# Active Collocated FEM Monitors (same method designation as primary)
170	15	2	1 San Jose	1 Vallejo

Historically, San Jose and Vallejo have had the first and second highest design values for $PM_{2.5}$ in the Bay Area. In 2014, Vallejo (DV = 26 µg/m3) fell to third highest behind San Jose and Livermore with 30 µg/m3 and 27 µg/m3, respectively.

The Air District expects to add two more FEM-BAM monitors (one at the near-road Berkeley Aquatic Park site and another at the near-road site in Dublin) by late 2015 or in 2016. This will bring the total number of FEM-BAMS in the PQAO to 17. The number of collocated sites is described in 40 CFR, Part 58 as 15% of the total in the PQAO, round-up. This would equate to three required collocated $PM_{2.5}$ sites. The Air District only has two at this time, so one more would be needed when the 17th FEM-BAM becomes operational.

Present plans are to operate a FEM/FRM at Concord to meet the collocation requirement because the Air District still has a FRM sampler in place at Concord. However, if possible, the Air District would like the third collocation site to be a FEM/FEM pair at San Pablo because the San Pablo site is close to refineries and in an area with a higher annual average (10.5µg/m3 at San Pablo and 6.6 µg/m3 at Concord in 2014). It would be desired to have a back-up FEM-BAM in the event of an emergency and provide redundant coverage for this community during times of maintenance or unforeseen outages to the primary instrument.

Minimum Monitoring Requirements for Near-road $PM_{2.5}$

In early 2013, 40 CFR Part 58 was revised to require at least one $PM_{2.5}$ monitor at near-road sites in CBSAs with populations of 1 million or more. The monitor is required to be operational by January 1, 2015 in CBSAs populations of 2.5 million or more and by January 1, 2017 in CBSAs with populations between 1 and 2.5 million. The minimum monitoring requirements are met and shown in Table 9 below.

Table 9. Near-Road monitoring for $PM_{2.5}$

CBSA	County or Counties	Pop. 2010 Census	# Near-road $PM_{2.5}$ Monitors Required by 1/1/2015	Active Near-road $PM_{2.5}$ Monitors as of 1/1/2015	# Near-road $PM_{2.5}$ Monitors Required by 1/1/2017
San Francisco-Oakland-Fremont	SF, Marin, Alameda, San Mateo, Contra Costa	4,335,391	1	1[a]	2[b]
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	0	1[c]	1
Santa Rosa-Petaluma	Sonoma	483,878	0	0	0
Vallejo-Fairfield	Solano	413,344	0	0	0
Napa	Napa	136,484	0	0	0

a The near-road Laney College site began operation on February 1, 2014.

b Another near-road site (Berkeley Aquatic Park) in the San Francisco-Oakland-Fremont CBSA is planned to open in the 2nd half of 2015. One additional site in Dublin is planned to open in the late 2015 or 2016.

c The near-road San Jose Knox site began operation on September 1, 2014.

Minimum Monitoring Requirements for PM_{10}

The number of required PM_{10} monitors in each CBSA is specified in Table D-4 of Appendix D to 40 CFR Part 58. To meet the requirements, a monitoring agreement is needed between the Bay Area Air Quality Management District and the Monterey Bay Unified Air Pollution Control District for the San Jose – Sunnyvale – Santa Clara CBSA. The Bay Area operates one monitor in Santa Clara County and Monterey Bay operates one monitor in San Benito County. The monitoring agreement is presented in Appendix C.

There are no monitoring agreements with the Northern Sonoma Air District because the Santa Rosa – Petaluma CBSA is not required to have any PM_{10} monitors. There are no monitoring agreements with the Yolo-Solano Air District because the Vallejo – Fairfield CBSA is not required to have any PM_{10} monitors. No additional monitors are required for the State Implementation Plan or Maintenance Plan because the Bay Area has never been designated as non-attainment for PM_{10}.

SPM PM_{10} monitoring at Bethel Island, Concord, and San Francisco was 1:12 in 2014. These monitors are not counted toward meeting the minimum monitoring requirements.

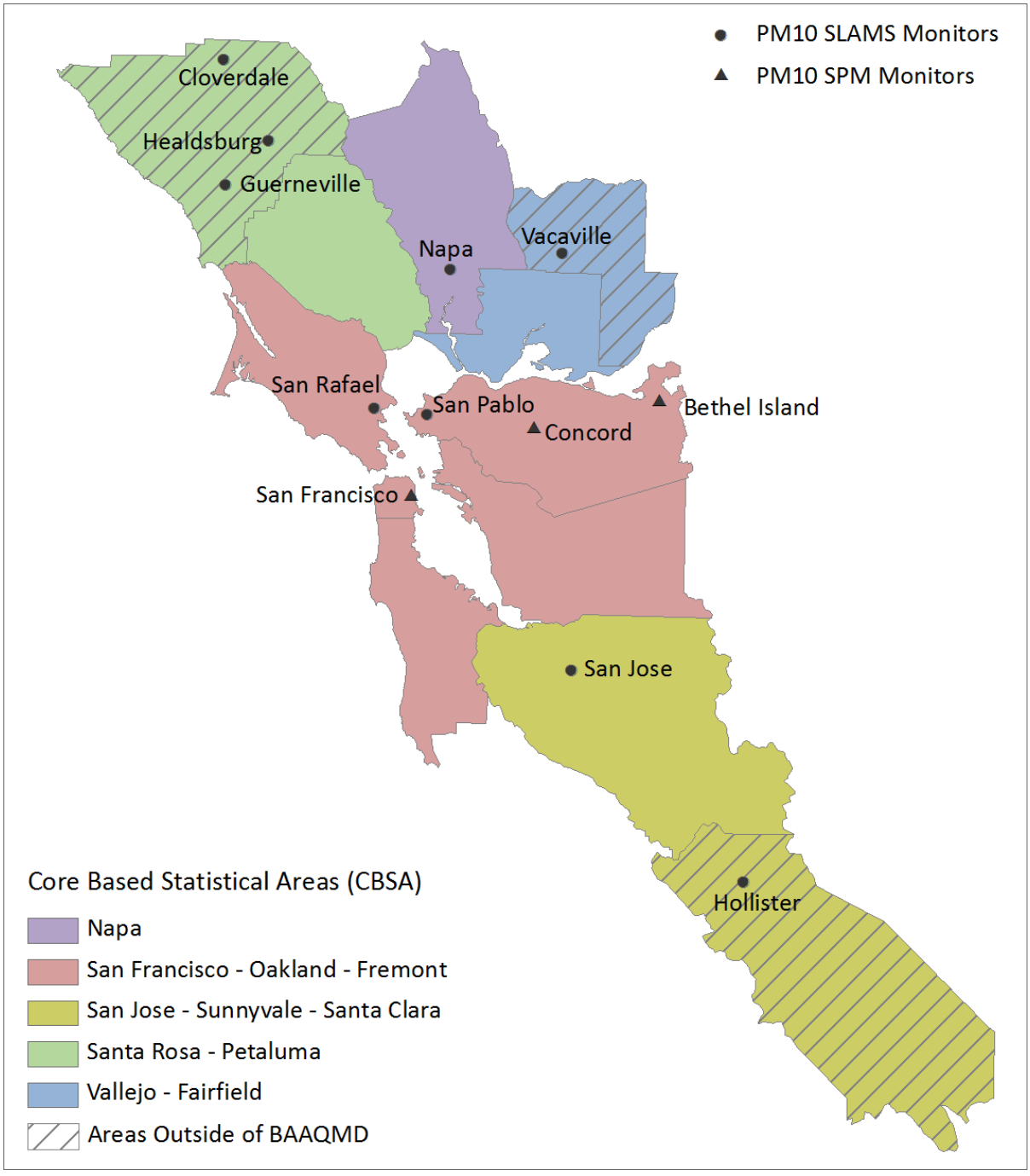
Table 10. Minimum Monitoring Requirements for SLAMS PM_{10} in 2014

CBSA	County or Counties	Pop. 2010 Census	Highest 24-hr conc. ($\mu g/m^3$)	Highest 24-hr conc. site & AQS ID	Required SLAMS Sites[a]	Active SLAMS Sites	Additional SLAMS Sites Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	57	Bethel Island 060131002	2-4	2	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	56	San Jose 060850005	2-4	2[b]	0
Santa Rosa-Petaluma	Sonoma	483,878	42	Healdsburg 060970002	0-1	3[c]	0
Vallejo-Fairfield	Solano	413,344	28	Vacaville 060953001	0-1	1[d]	0
Napa	Napa	136,484	37	Napa 060550003	0-1	1	0

a For PM_{10} in the Bay Area, the number of monitors required depends on the population of the CBSA and whether the ambient concentration of PM_{10} exceed 80% of the 150 $\mu g/m^3$ NAAQS. No stations in the CBSAs listed exceed the 80% threshold. Therefore, the minimum monitoring requirement is determined from Table D-4 of Appendix D, Part 58 of 40 CFR under the "low concentration" category.

b One of the two monitors is not in the BAAQMD. It is in Hollister which is in the Monterey Bay Unified Air Pollution Control District.
c These monitors are not in the BAAQMD. They are in Healdsburg, Guerneville, and Cloverdale; and all are in the Northern Sonoma Air Pollution Control District.
d This monitor is not in the BAAQMD. It is in Vacaville which is in the Yolo-Solano Air Quality Management District.

Figure 8. PM_{10} monitoring in the San Francisco Bay Area in 2014



Minimum Monitoring Requirements for Collocated PM_{10}

40 CFR, Part 58, Appendix A requires each network of manual PM_{10} samplers to have collocated monitoring at 15% (or at least one) of the monitoring sites within a PQAO. The PM_{10} network in the Bay Area uses sampling methods 063, 141, and 127 for manual samplers. Table 11 summarizes the collocation of PM_{10} in the Bay Area during 2014.

Table 11. Collocated PM_{10} monitoring in the Bay Area in 2014

Method Code	# Primary SLAMS Manual Monitors	# Required SLAMS Collocated Manual Monitors	# Active SLAMS Collocated Manual Monitors
063/141 (HiVol)	3	1	1 Napa
127 (LoVol)	1*	0	0

* This monitor is at San Jose and is part of a PM coarse pair for the national NCore program.

Although the collocated sampler at Napa is only required to operate on a 1:12 schedule, the Bay Area operates the sampler 1:6 throughout the year, although the collocated sampling frequency may be reevaluated in the future.

Napa has been the collocation site for PM_{10} since 2004 because the site resides within the Napa Valley which is a major agricultural region in the Bay Area where burning of pruning's from vineyards and orchards is very common. The site also has a history of having the highest PM_{10} concentration in the Bay Area (such as in 2011) as shown in Table 12 below. San Jose has the highest frequency of having the highest annual mean but this site has extensive air monitoring activities, including collocated $PM_{2.5}$. There is no space remaining at the San Jose Jackson site for PM_{10} collocation, unless other monitoring (NCore, CSN STN, or NATTS) is curtailed.

Due to the Napa site being relocated in 2015, collocated PM_{10} monitoring will be moved to either San Pablo or San Rafael. The monitoring trailer that will be used at the Napa College site is too small to allow for the required distanced between the primary and collocated samplers. Because all sites in the table below are so close to each other in annual mean, discussions between Region 9 and the Air District concluded that operating collocated PM_{10} at whichever site was most logistically feasible was the best option.

Table 12. Annual Mean PM_{10} (µg/m3) at SLAMS monitoring sites in the Bay Area

Site	2010	2011	2012	2013	2014
Napa	16.6	19.2	15.2	17.7	14.8
San Jose	18.5	18.1	17.8	21.3	18.9
San Pablo	17.8	18.5	14.8	17.4	15.4
San Rafael	15.7	15.5	12.4	14.6	13.3

Minimum Monitoring Requirements for SO_2

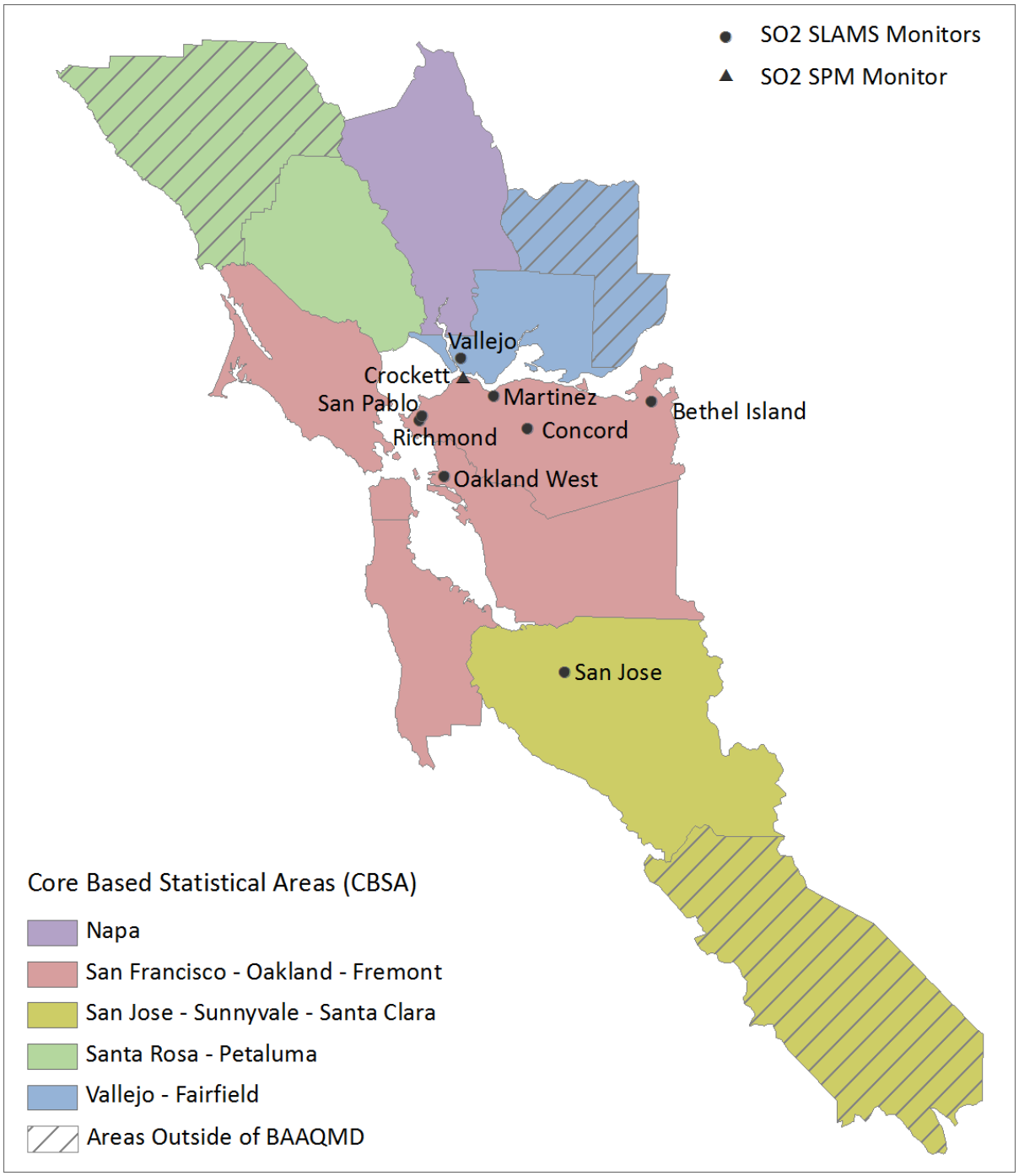
The number of required SO_2 monitors in each CBSA is proportional to the product of the total amount of SO_2 emissions in the CBSA and its population as specified in 40 CFR Part 58, Appendix D, Section 4.4. The resulting value is defined as the Population Weighted Emissions Index (PWEI). SO_2 emissions shown in Table 13 are from the 2011 National Emissions Inventory (NEI). Table 13 also shows that the Air District monitoring network meets or exceeds the SO_2 minimum monitoring requirements because 40 CFR requires one SO_2 monitor if the PWEI value is greater than 5,000 but less than 100,000 and none when the value is less than 5,000.

No additional SO_2 monitors are required for SIP or Maintenance Plans because the Air District has never been designated as non-attainment for SO_2 and no SIP or maintenance plans have been prepared for SO_2. In 2014 the Air District operated eight SO_2 monitors in its SLAMS network and one SPM SO_2 monitor at Crockett as shown in Figure 9. The one SO_2 monitor in the San Jose-Sunnyvale-Santa Clara CBSA was located at San Jose Jackson and is required, not based on PWEI, but because San Jose is a NCore site.

Table 13. Minimum Monitoring Requirements for SO_2 in 2014.

CBSA	County or Counties	Pop. 2010 Census	Total SO_2 (tons/yr) 2011 NEI	PWEI (million-person-tons/yr)	Required SLAMS Monitors	Active SLAMS Monitors	Additional SLAMS Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	5318	23056	1	6	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	608	1117	1 (NCore)	1	0
Santa Rosa-Petaluma	Sonoma	483,878	20	10	0	0	0
Vallejo-Fairfield	Solano	413,344	4080	1686	0	1	0
Napa	Napa	136,484	6	1	0	0	0

Figure 9. SO_2 monitoring in the San Francisco Bay Area in 2014



Minimum Monitoring Requirements for NO_2

On April 12, 2010 EPA revised the minimum monitoring requirements for NO_2 in 40 CFR Part 58, Appendix D, Section 4.3 and required the Air District to operate NO_2 monitors at population-oriented sites and at sites within 50 meters of major freeways (near-road sites). In addition, the new rule required the EPA Regional Administrators to require an additional 40 sites nationwide to monitor NO_2 in areas with susceptible and vulnerable populations by January 1, 2013.

On March 14, 2013, EPA updated the implementation date for near-road monitoring sites. The first near-road monitoring site within a CBSA had to be operational by January 1, 2014 and the second within a CBSA, if required, had to be operational by January 1, 2015.

Based on Bay Area population, the Air District is required to operate at least two monitors sited to measure the area-wide NO_2 concentrations (by January 1, 2013) and three near-road monitoring sites (two required by January 1, 2014 and one additional monitor by January 1, 2015). No additional monitors are required for the SIP or Maintenance Plans because the Air District is not designated as non-attainment for NO_2 and no SIP or maintenance plans have been prepared for NO_2.

In 2014, the Air District operated nine area-wide NO_2 monitors in the Bay Area. One of the nine, the Oakland West air monitoring site, was selected as one of the forty nationwide sites for monitoring NO_2 in areas with susceptible and vulnerable populations. This air monitoring site is also the monitor with the expected highest NO_2 concentrations representing the neighborhood or larger spatial scales in the San Francisco - Oakland - Fremont CBSA with the 2014 annual average of 14 ppb. Likewise, the San Jose air monitoring station is expected to have the highest NO_2 concentrations in the San Jose - Sunnyvale - Santa Clara CBSA with the 2014 annual average of 13 ppb. Figure 10 shows the area-wide, non-area-wide, near-road and SPM monitors in the Bay Area.

The most important spatial scale for near-road NO_2 monitoring stations to effectively characterize the maximum expected hourly NO_2 concentration due to mobile source emissions on major roadways is the microscale. The most important spatial scales for other monitoring stations characterizing maximum expected hourly NO_2 concentrations are the microscale and middle scale. The most important spatial scale for area-wide monitoring of high NO_2 concentrations is the neighborhood scale. Table 14 shows NO_2 monitors at various spatial scales by CBSA.

NO_2 monitoring at Napa, Oakland, San Rafael, and San Pablo are middle scale based on traffic counts and the distance between the monitors and the nearest traffic lane to the monitors. Therefore, these sites are not counted toward meeting the area-wide requirements of 40 CFR. San Ramon and Patterson Pass sites also monitor NO_2 and are neighborhood or larger scale but these monitors are SPMs and are not be counted toward meeting the minimum area-wide monitoring requirements. Table 15 shows NO_2 minimum monitoring requirements by CBSA.

The Air District meets the NO_2 minimum monitoring requirements for area-wide and Regional Administrator Required Monitoring. The near-road monitoring is expected to be met by mid-2015 pending the opening of the Berkeley Aquatic Park (Near-road) air monitoring station. The process of installation of this air monitoring station has been delayed by the permitting process

with the City of Berkeley and was approved on February 10, 2015. Other logistics for installing electrical and shelter are ongoing as of May 1, 2015.

Table 14. NO_2 Monitors at Various Spatial Scales

CBSA	Pop. 2010 Census	Sites at Micro Scale	Sites at Middle Scale	Sites at Neighborhood or Larger
San Francisco-Oakland-Fremont	4,335,391	Laney College	Oakland, San Pablo and San Rafael	Bethel Island, Concord, Livermore, Oakland West, Patterson Pass, Redwood City, San Francisco and San Ramon
San Jose-Sunnyvale-Santa Clara	1,836,911	San Jose Knox	None	San Jose Jackson
Santa Rosa-Petaluma	483,878	None	None	Sebastopol
Vallejo-Fairfield	413,344	None	None	Vallejo
Napa	136,484	None	Napa	None

Table 15. Minimum Monitoring Requirements for NO_2.

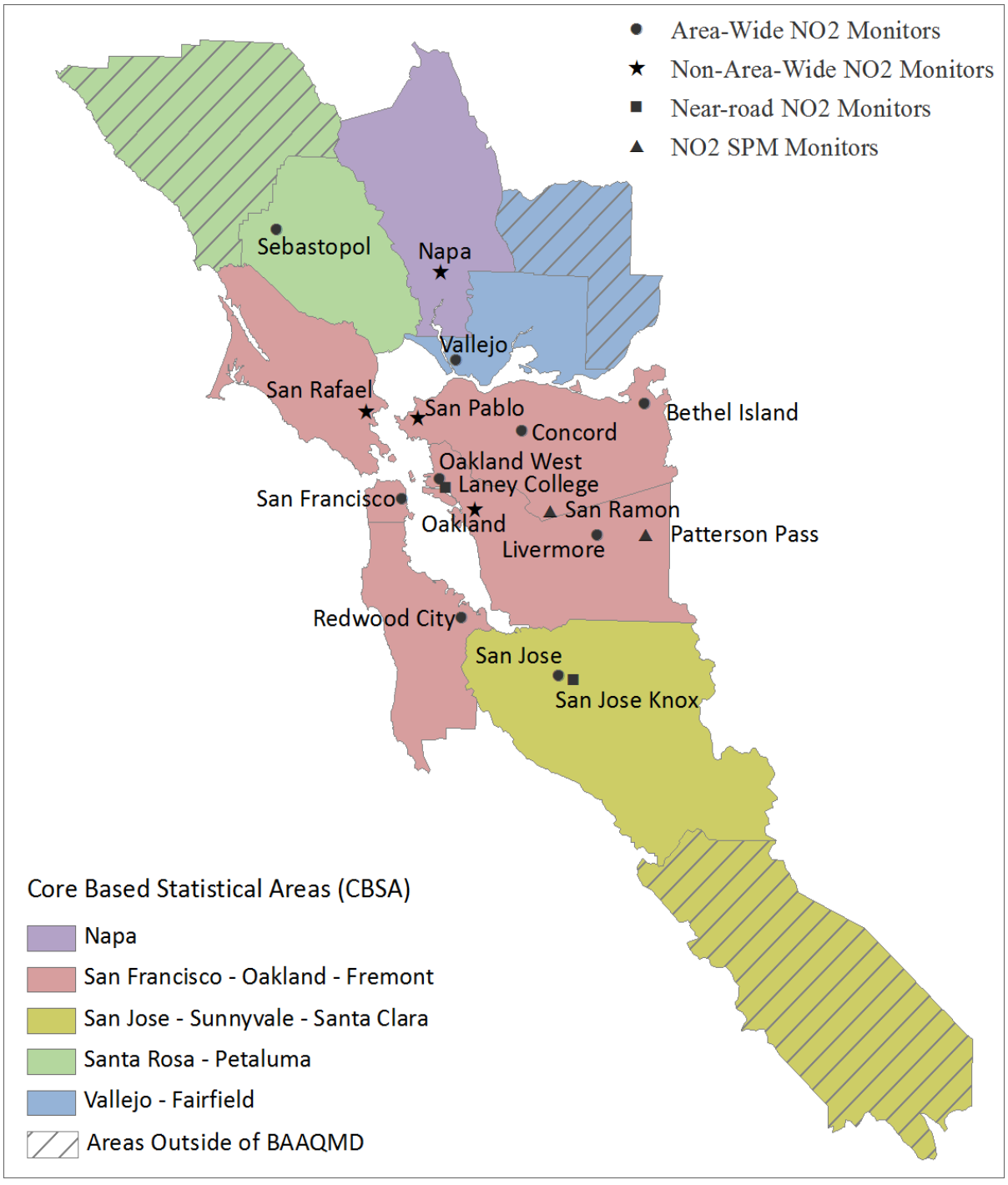
CBSA	Pop. 2010 Census	Max AADT (2013)	Required Near-road Monitors	Active Near-road Monitors	Additional Near-road Monitors Needed	Required Area-wide Monitors	Active Area-wide Monitors	Additional Area-wide Monitors Needed
San Francisco-Oakland-Fremont	4,335,391	270,000	2	1	1[a]	1[b]	6	0
San Jose-Sunnyvale-Santa Clara	1,836,911	245,000	1	1	0	1	1	0
Santa Rosa-Petaluma	483,878	146,000	0	0	0	0	1	0
Vallejo-Fairfield	413,344	202,000	0	0	0	0	1	0
Napa	136,484	119,000	0	0	0	0	0[c]	0

a An additional near-road monitor is expected to open at Berkeley Aquatic Park by mid-2015.

b One area-wide monitor is required however the Oakland West monitoring site was selected as one of the 40 nationwide sites for monitoring near susceptible and vulnerable populations. Therefore, there are two required for this CSBA (one based on population and one for Regional Administrator Required Monitoring).

c NO_2 is monitored at Napa, but based on the distance to the roadway, the scale of monitoring is middle scale. Therefore this monitor cannot be counted as an area-wide monitor.

Figure 10. NO_2 Monitoring in the San Francisco Bay Area in 2014



Minimum Monitoring Requirements for CO

Effective October 31, 2011, 40 CFR Part 58, Appendix D was revised for Carbon Monoxide (CO) monitoring. The revision requires one CO monitor to operate collocated with a near-road NO_2 monitor by January 1, 2015 in CBSAs having a population of 2,500,000 or more. If a CBSA is required to have more than one near-road NO_2 monitor, only one CO monitor is required to be collocated with the NO_2 monitor within that CBSA. Additionally, in CBSAs with a population between 1 and 2.5 million, a CO monitor is required to be collocated with a near-road NO_2 monitor by January 1, 2017. There are no other minimum requirements for CO monitoring as shown in Table 16. The Air District intends to operate collocated CO monitors with all required near-road NO_2 monitors and the first CO near-road monitor became operational on February 1, 2014 at Laney College. The second near-road monitor in the Bay Area was at San Jose Knox Avenue. It became operational on September 1, 2014.

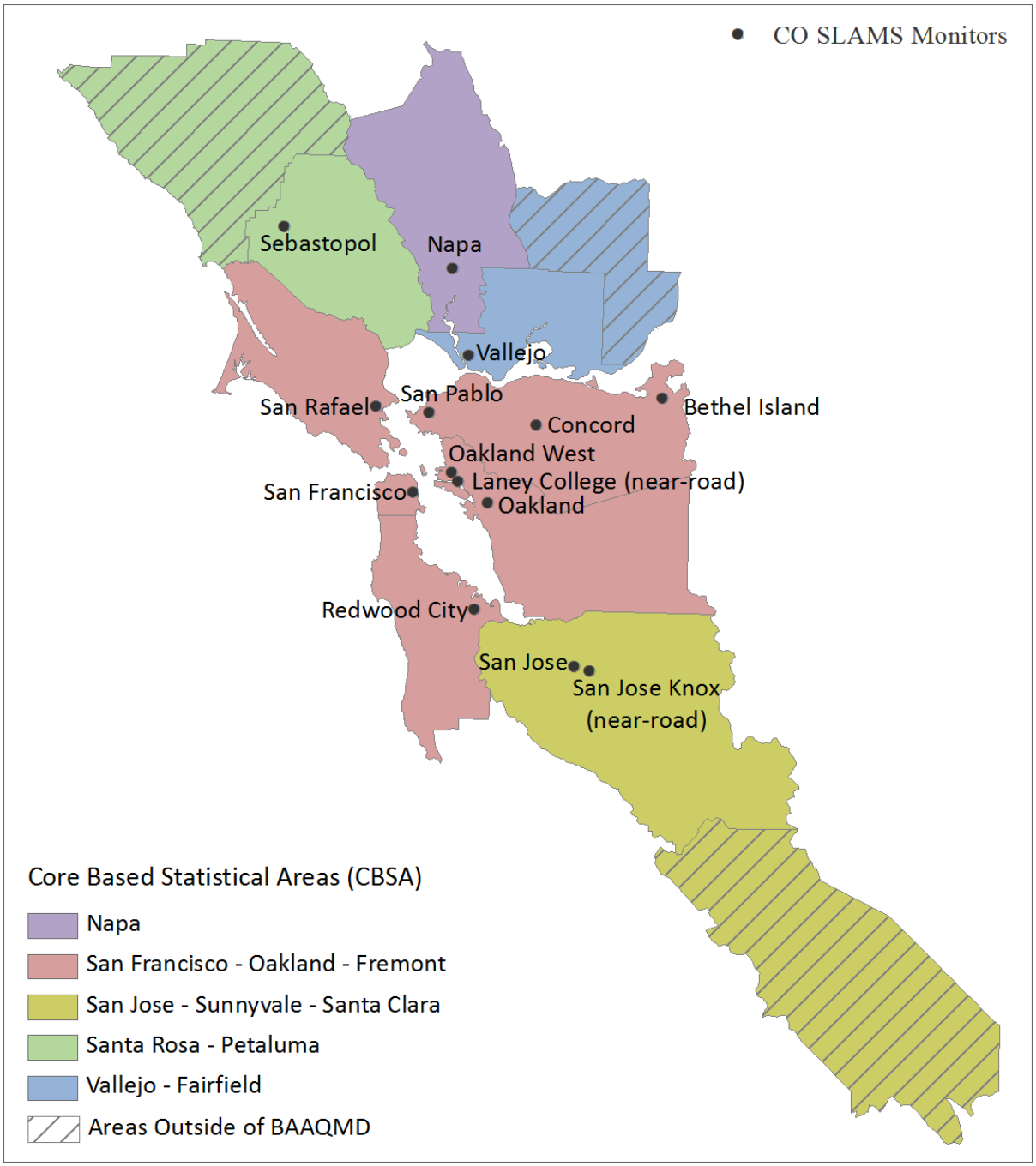
Table 16. Minimum Monitoring Requirements for CO.

CBSA	County or Counties	Pop. 2010 Census	Near-Road Monitors Required (2015-2017)	Near-Road Monitors Active in 2014	Near-Road Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,335,391	1	1	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,836,911	1	1	0
Santa Rosa-Petaluma	Sonoma	483,878	0	0	0
Vallejo-Fairfield	Solano	413,344	0	0	0
Napa	Napa	136,484	0	0	0

* This monitor will be shared with Monterey Bay Unified APCD. The monitoring agreement is in Appendix E.

The Air District was re-designated attainment for the CO 8-hour NAAQS in 1998. The Air District CO maintenance plan is contained within the California Air Resource Board document "2004 Revision to the California State Implementation Plan for Carbon Monoxide." The plan does not specify the number of CO monitors needed. In 2014, the Air District operated one CO monitor within each of the nine Bay Area counties plus additional CO monitors in large cities and two near-road CO monitors as shown in Figure 11.

Figure 11. CO monitoring in the San Francisco Bay Area in 2014



Minimum Monitoring Requirements for Lead

40 CFR Part 58, Appendix D, Section 4.5 requires lead monitoring near sources expected to contribute to a maximum lead concentration in ambient air in excess of the NAAQS. In the Bay Area there are no sources meeting this criteria according to the 2008 National Emissions Inventory (NEI). However, additional sections of 40 CFR do require source oriented monitoring near three airports in the Bay Area (Palo Alto, San Carlos, and Reid-Hillview) because emissions from piston engine aircraft using leaded fuel may approach 0.50 tons per year. One of the airport

lead monitoring sites is also required to operate a collocated sampler. Additionally, lead monitoring is required at San Jose because it is an NCore & NATTS monitoring location. Minimum monitoring requirements for source oriented lead at airports and the population oriented NCore site at San Jose are provided in Table 17, Although no sampler operated in 2014, the San Carlos Airport II sampler began operation on March 25, 2015.

Table 18, and Although no sampler operated in 2014, the San Carlos Airport II sampler began operation on March 25, 2015.
Table 19.

The San Carlos Airport lead monitoring site was moved about 120 yards to the southeast because the property owner at the original site did not renew the lease. Data collected at the original site ended on September 13, 2013 and resumed at the new location on March 25, 2015.

Table 17. Source Oriented lead monitoring at airports in 2014.

Source Name	Address	Pb Emissions (tons/yr)	Emission Inventory Source Data & Yr	Monitors Required	Monitors Active	Monitors Needed
San Carlos Airport	620 Airport Dr. San Carlos 94070	0.53	NEI/2008	1	0[a]	1[a]
Palo Alto Airport	1925 Embarcadero Rd. Palo Alto 94303	0.66	NEI/2008	1	1	0
Reid-Hillview Airport	2500 Cunningham Ave. San Jose 95148	0.53	NEI/2008	1	1	0

a. Although no sampler operated in 2014, the San Carlos Airport II sampler began operation on March 25, 2015.

Table 18. Collocated Source Oriented lead monitoring at airports in 2014.

Source Name	Address	Pb Emissions (tons/yr)	Emission Inventory Source Data & Yr	Collocated Monitors Required	Monitors Active	Monitors Needed
San Carlos Airport	620 Airport Dr. San Carlos 94070	0.53	NEI/2008	1	0[b]	1[b]

b. Although no sampler operated in 2014, the San Carlos Airport II sampler began operation on March 25, 2015.

Table 19. Minimum Monitoring Requirements for lead at NCore (not Source Oriented) in 2014.

NCore Site	CBSA	Pop. 2010 Census	Monitors Required	Monitors Active	Monitors Needed

San Jose	San Jose-Sunnyvale-Santa Clara	1,836,911	1	1	0

Modifications Made to Network in 2014

Lead – Palo Alto Airport

The Palo Alto Airport lead site was shut down at the end of December 2014 because Santa Clara County sold the property to the City of Palo Alto. The sale triggered FAA review of various operational plans and permits, revealing that the lead sampler was not properly located according to FAA regulations. When a suitable location is found, lead monitoring will resume at this airport. The Air District will use a new site ID in AQS thereby keeping the old and new site datasets separate.

Lead – Redwood City – Twin Dolphin

Lead monitoring at Twin Dolphin Drive in Redwood City was shut down in March 2014. This location was selected for lead monitoring because the San Carlos Airport lead monitoring site showed lead values within 50% of the NAAQS. Therefore, the Air District began monitoring on Twin Dolphin Drive which is just north of the airport property. Laboratory analysis showed lead concentrations at the Twin Dolphin site were well below EPA lead standards.

Lead – San Carlos Airport

The primary and collocated San Carlos Airport (I) lead monitoring samplers were moved about 120 meters southeast because the property owner did not renew the license agreement at the existing site. The last day of operation for San Carlos Airport I (AQS site ID 06-081-2002) was September 13, 2013 for both primary and collocated sampling. A new site, San Carlos Airport II (AQS site ID 06-081-2004) opened on March 25, 2015 for both primary and collocated sampling. The new site will operate primary sampling 1:6 and collocated sampling 1:12 as was done at the previous site.

Near-Road Monitoring (NO2, CO, PM2.5, BC, and Ultrafine Particles)

Based on CBSA population, the Air District is required to operate three near-road NO_2 monitoring sites. Two are required in the San Francisco-Oakland-Fremont CBSA and one is required in the San Jose-Sunnyvale-Santa Clara CBSA. Although only one near-road CO and $PM_{2.5}$ monitor is required in each CBSA collocated with the NO_2 monitor, the Air District collocates CO and $PM_{2.5}$ monitors at all near-road NO_2 sites.

Laney College became the first operational near-road site on February 1, 2014. The San Jose – Knox Avenue site began operations on September 1, 2014. The Berkeley Aquatic Park site is expected to be operational in July 2015.

Ultrafine particulate monitoring (UFP) is not required by EPA regulations but the Air District equips each near-road monitoring site with instrumentation capable of detecting nanoscale particles with sizes less than 0.1 microns (100 nanometers).

The Bay Area Air Quality Management District has signed an agreement to allow the Monterey Bay Air Pollution Control District to share CO, NO_2, and $PM_{2.5}$ monitoring responsibilities at the at San Jose Knox Avenue site. The monitoring agreement is in Appendix E.

San Jose NO_y monitoring for NCore

In March 2014, the Air District requested a waiver to discontinue NO_y monitoring because the past three years of data showed an insignificant statistical difference between NOx and NOy. The waiver request is in Appendix F.

Sebastopol

The Santa Rosa site had to be closed in December 2013 following the landlords request to vacate the property. Although the first choice of the Air District was to find a new site in Santa Rosa, that could not happen within the time constraint of having a new site operating by mid January. Rather than continuing to conduct a time intensive search in Santa Rosa, the Air District opted to sign a lease for a new site in Sebastopol. The Sebastopol air monitoring site in Sonoma County began on January 9, 2014. The new site met all completeness requirements for 2014 for measured pollutants and is considered the highest ozone site in the Santa Rosa – Petaluma CBSA that is within the boundaries of the Air District.

Proposed Modifications to Network in 2015-2016

Gilroy

The Air District may request Region 9 approval to close this site in 2015 or 2016. This site only monitors ozone and $PM_{2.5}$. The last ozone exceedance at Gilroy was in the fall of 2010. The site has gone four consecutive summers without a national exceedance for ozone. The design value for ozone is 66 ppb (2012-2014) which is not the highest in the CBSA (San Martin is the highest with 70 ppb). For $PM_{2.5}$, the design value is 18µg/m3, which is the lowest in the Bay Area and there has not been a $PM_{2.5}$ exceedance in the past three years.

In terms of minimum monitoring requirements, for ozone, the Bay Area Air District would still meet minimum monitoring requirements. There is an ozone monitoring agreement with Monterey Bay, and that agreement allows Monterey to share responsibilities with our network for the San Jose – Sunnyvale – Santa Clara CBSA (there are sites at San Jose, San Martin, and Los Gatos). Therefore, Monterey would still meet the minimum monitoring requirements for ozone. For $PM_{2.5}$, the Air District would move the $PM_{2.5}$ FEM-BAM from Gilroy to San Martin, which is just 5.5 miles north so there is no net change in the number of $PM_{2.5}$ monitors for this CBSA. This will allow better utilization of resources by eliminating an unneeded site, and combining the two sites into one larger monitoring site.

Lead – Palo Alto Airport

The Palo Alto Airport lead site was shut down at the end of December 2014 because the property was sold from Santa Clara County to the City of Palo Alto. The sale triggered the FAA to review and reissue various operational plans and permits, revealing that the lead sampler was not properly located according to FAA regulations. When a suitable location is found, lead monitoring will resume at this airport. The Air District will use a new site ID in AQS thereby keeping the old and new site datasets separate.

Lead – San Carlos Airport

The San Carlos Airport (AQS ID 06-081-2002) lead monitoring samplers (primary and collocated) were closed on September 13, 2013 at the request of the property owner who declined

to renew the lease. A new site was opened on March 25, 2015. The new site (named San Carlos Airport II) is about 120 meters southeast of the previous site (now named San Carlos Airport I).

The San Carlos Airport II site has AQS site ID 06-081-2004. A new AQS site ID was requested by Region 9 because the new location was expected to have lower lead concentrations because it is farther from the runway than the old site and, therefore, two separate data sets were desired. The new site will operate primary sampling 1:6 and collocated sampling 1:12 as was done at the previous site.

Napa

This site will be shut down during the 2nd half of 2015 and a new site, at Napa College, will open. The Napa College site already has an Air District meteorological system.

Near-road site to open in Dublin area

At the request of an Air District Board member, the Air District will be opening a near-road air monitoring site in Dublin near the intersections of Highways 580 and 680 in late 2015 or in 2016.

PM2.5 Collocation

The Air District operates 15 FEM-BAMS as primary monitors and expects to add two more monitors (one at the near-road Berkeley Aquatic Park site and another at the near-road site in Dublin) by late 2015 or in 2016. This will bring the total number of FEM-BAMS in the PQAO to 17. The number of collocated sites is described in 40 CFR, Part 58 as 15% of the total in the PQAO, round-up. This would equate to three required collocated $PM_{2.5}$ sites. The Air District only has two at this time, so one more would be needed when the 17th FEM-BAM becomes operational.

Present plans are to operate a FEM/FRM at Concord to meet the collocation requirement because the Air District still has a FRM sampler in place at Concord. However, if possible, the Air District would like the third collocation site be a FEM/FEM pair at San Pablo because the San Pablo site is close to refineries and in an area with a higher annual average (10.5µg/m3 at San Pablo and 6.6 µg/m3 at Concord in 2014). It would be desired to have a back-up FEM-BAM in the event of an emergency and provide redundant coverage for this community during times of maintenance or unforeseen outages to the primary instrument.

San Martin

If Region 9 approves the closure of the Gilroy site, then the FEM BAM instrument at Gilroy would be moved 5.5 miles north to San Martin. This may happen during 2015 or 2016, but nothing has been finalized (see discussion on Gilroy in this section).

Removing a NAAQS Compliance Monitor

When the Air District proposes changes to the air monitoring network, the proposed changes are included in the Annual Monitoring Network Plan. The Annual Monitoring Network Plan is posted on the Air District web site for 30 days for public comment on the proposed changes. After the public comment period, the Air District reviews and considers the comments before making a final decision on a change to air monitoring network. The Air District submits the Annual Monitoring Network Plan with public comments to the EPA Region 9 Regional Administrator by July 1 each year.

Before shutting down a SLAMS (State or Local Air Monitoring Station) monitor, 40 CFR Part 58.14c requires that the Air District obtain the Regional Administrator's written approval. The Regional Administrator will normally approve the shutdown of a SLAMS monitor when any of the following situations apply:

1) Criteria pollutant monitors which have shown attainment of the national standards during the previous five years may be removed if the probability is less than 10% that the monitor will exceed 80% of NAAQS during the next three years, and if the monitor is not required by an attainment or maintenance plan.
2) CO, PM_{10}, SO_2, or NO_2 monitors may be removed if the monitor has shown consistently lower concentrations than another monitor for the same pollutant in the same county during the previous five years.
3) Criteria pollutant monitors that have not violated the national standards in the most recent five years may be removed if the State Implementation Plan (SIP) provides a method of representing the air quality in the applicable county.
4) $PM_{2.5}$ monitors may be removed when EPA determines that measurements are not comparable to the relevant NAAQS because of siting issues.
5) Criteria pollutant monitors which are located upwind of an urban area to characterize transport may be removed if the monitor has not recorded violations of the relevant NAAQS in the previous five years, and if the monitor is being replaced by another monitor that characterizes transport.
6) Criteria pollutant monitors not eligible for removal under any of the above criteria may be moved to a nearby location with the same scale of representation if logistical problems beyond the agency's control make it impossible to continue operation at its current site.

The closure of a SPM (Special Purpose Monitor) monitor does not require approval from EPA, but a change in the designation of a monitoring site from SLAMS to SPM requires approval of the Regional Administrator.

Data Submission Requirement

After all data review procedures are complete, the Air District submits monthly air quality and associated precision and accuracy reports to the EPA AQS database within 90 days of the end of every month. By May 1 each year, the Air District submits a data certification letter to Region 9 stating that the previous calendar year of data is complete and correct. The certification letter for 2014 data was submitted to EPA Region 9 on April 13, 2015.

Site Information Definitions

The next section describes each of the 32 air quality site operating within the Bay Area Air Quality Management District in 2014. One additional site, San Carlos Airport, was closed and was being relocated. It did not operate at all during 2014 but both the old and new San Carlos Airport sites are listed in the detailed site description section. Also listed is the new Berkeley Aquatic Park near-road air monitoring site which will not open until the summer of 2015. The site descriptions include siting information about the site and the individual monitors at the site. Monitors must be operated following EPA requirements found in 40 CFR Part 58. These regulations also specify monitor siting criteria.

Included in each site description is the number of days when a criteria pollutant measurement exceeded the National Ambient Air Quality Standard (NAAQS). The national standards for hourly and daily averaging times are shown in Table 20 below. Based on the past ten years of air monitoring data, only ozone and $PM_{2.5}$ are pollutants of interest to Bay Area residents because the other pollutants rarely, if ever, exceed the NAAQS. The table below is abbreviated for clarity. A full list of national and California air quality standards and the air district's attainment status for each pollutant can be viewed at: http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm

Table 20. National Ambient Air Quality Standards (as of December 31, 2014)

Pollutant	Averaging Time	Standard
Ozone	8 hour	0.075 ppm
$PM_{2.5}$	24 hour	35 µg/m^3
PM_{10}	24 hour	150 µg/m^3
Carbon Monoxide	1 hour	35 ppm
	8 hour	9 ppm
Sulfur Dioxide	1 hour	75 ppb
Nitrogen Dioxide	1 hour	100 ppb
Lead	Rolling 3-month average	0.15 µg/m^3

More detailed information about NAAQS standards, including past standards, may be found at: http://epa.gov/air/criteria.html. Table 21 below explains the monitoring terms and definitions used in the detailed site summaries found in the site information sections found later in this document.

Table 21. Monitor Information Definitions and EPA Air Monitoring Siting Criteria.

Site or Monitor Information	Definition of Terms
AQS ID	The 9-digit code that identifies each site in the EPA's AQS database
GPS Coordinates (decimal degrees)	The latitude and longitude of the site from the World Geodetic System (WGS-84) used as the reference coordinate system for Global Positioning System (GPS).
Distance to roadways from the gaseous probe (meters)	*40 CFR Part 58 Appendix E, 6.0*: requires that monitors be located far enough from roadways to minimize local mobile impacts on measurements. Recommended distances are found in Table E-1 for NO_x and ozone, Table E-2 for CO, and Figure E-1 for PM.
Traffic Count	The annual average daily traffic (AADT) count.
Groundcover	*40 CFR Part 58 Appendix E, 3.0*: states that particulate samplers should not be located in an unpaved area unless there is vegetative ground cover year round, so that the impact of wind blown dusts will be kept to a minimum.
Statistical Area	The core based statistical area (CBSA) the site is located within.
Pollutant, POC	The pollutant being measured and its Parameter Occurrence Code (POC). There may be multiple instruments measuring a pollutant at a site. Each instrument is assigned a POC to differentiate it from the others in EPA's AQS database.
Primary/QA Collocated/Other	This row applies to parameters that have collocation requirements as well as parameters that are combined at a site level for design value calculations. This currently includes $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, and NO_2.
Parameter code	The 5-digit code assigned to each pollutant in the EPA's AQS database.
Basic monitoring objective(s)	The purpose for monitoring at that location. Choices include public information, NAAQS comparison, and research.
Site type(s)	Choices include extreme downwind, highest concentration, maximum ozone concentration, maximum precursor impact, population exposure, source oriented, upwind background, general background, regional transport, welfare-related impacts, quality assurance, other.
Monitor type(s)	Choice include IMPROVE, index site, industrial, NATTS, NCore, non-EPA Federal, PAMS, proposed NCore, QA Collocated, SLAMS, special purpose, supplemental speciation, trends speciation, tribal monitors, unofficial PAMS.
Network affiliation(s)	Some monitors are used for specific types of monitoring networks. Examples which apply to the Bay Area include: CSN STN, CSN supplemental, NATTS, NCore, Near Road, and Unofficial PAMS. The full list may be found at: https://aqs.epa.gov/aqsweb/codes/data/MonitorNetworks.html
Instrument manufacturer and model	Details about the instrumentation used to measure the pollutant.
Method code	Based on the Instrument manufacture and model, a method code is assigned and is reported to the EPA AQS database system. *40 CFR Part 58 Appendix C, 2.0*: requires that the monitor used must be from EPA's current List of Designated Reference and Equivalent Methods.
FRM/FEM/ARM/other	A FRM is a federal reference method (the gold standard) for measuring a pollutant. A FEM is a federal equivalent method for measurement. Both are approved by EPA for use in air monitoring programs. ARM (approved regional method) instruments are not used in the Bay Area.

Site or Monitor Information	Definition of Terms
Collecting Agency	The agency that operates the instrument at a site. Usually this is the Air District but at some sites, such as Point Reyes, the California Air Resources Board operates an instrument within the Bay Area.
Analytical Lab	The agency that weighs particulate filters or does chemical or gas analysis of particulate filters and toxics compounds.
Reporting Agency	The agency that uploads air monitoring data to the EPA's AQS database.
Spatial scale	The relative distance over which the air pollution measurements are representative. Choices are micro, middle, neighborhood, urban, regional, national, or global scales.
Monitor start date	The date valid data collection began for that pollutant at an air monitoring station.
Current Sampling frequency	Describes if the monitor is operated continuously (hourly) or intermittently. Intermittent sampling is done for particulate matter collected by a filter and is either 1:1 (every day), 1:3 (every third day), 1:6 (every sixth day), etc. Toxics sampling is also done on an intermittent sampling schedule.
Required Sampling frequency	If exceptional event exemptions were petitioned to EPA for exclusion in NAAQS attainment or required sample frequency calculations, this column describes the sampling frequency with exceptional events included and excluded.
Sampling season	The date range measurements were made. Some ozone sites in the Bay Area are not required to run during the winter.
Probe height (meters)	*40 CFR Part 58 Appendix E, 2.0*: requires that probe height be 2-15 meters above ground level (AGL).
Distance from supporting structure (meters)	*40 CFR Part 58 Appendix E, 2.0*: requires the probe be at least 1 meter vertically or horizontally away from any supporting structure unless it is a roof, in which case 1 meter separation is required.
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	*40 CFR Part 58 Appendix E, 4.0*: requires that the distance from the obstacle to the probe or inlet must be at least twice the height that the obstacle protrudes above the probe or inlet. PM samplers must have a 2 meter separation from walls, parapets and structures. 4.0 (b)
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	*40 CFR Part 58 Appendix E, 4.0*: requires that the distance from the obstacle to the probe or inlet must be at least twice the height that the obstacle protrudes above the probe or inlet.
Distance from trees (meters)	*40 CFR Part 58 Appendix E, 5.0*: requires that probe be at least 10 meters from the nearest tree drip line.
Distance to furnace or incinerator flue (meters)	*40 CFR Part 58 Appendix E, 3.0*: requires that scavenging be minimized by keeping the probe away from furnace or incineration flues or other minor sources of SO_2 or NOx. The separation distance should take into account the heights of the flues, type of waste or fuel burned, and the sulfur content of the fuel.
Distance between monitors fulfilling a QA collocation requirement (meters)	*40 CFR Part 58 Appendix A, 3.2.5.6*: requires that PM monitors be 2-4 meters apart for flow rates >200L/m and have a 1-4 meter separation for flow rates <200 L/m.
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	*40 CFR Part 58 Appendix A, 3.2.5.6*: requires that PM monitors with flow rates <200L/m have at least a 1 meter separation.
For high volume PM instrument (flow rate >	*40 CFR Part 58 Appendix A, 3.2.5.6*: requires that PM monitors

Site or Monitor Information	Definition of Terms
200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	with flow rates > 200L/m have at least a 2 meter separation.
Unrestricted airflow (degrees)	*40 CFR Part 58 Appendix E, 4.0*: requires the probe or inlet to have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential.
Probe material for reactive gases	*40 CFR Part 58, Appendix E, 9.0*: requires that either Pyrex glass or FEP Teflon be used for intake sampling lines.
Residence time for reactive gases (seconds)	*40 CFR Part 58, Appendix E, 9.0*: recommends a residence time of 20 seconds or less for gaseous sampling.
Will there be changes within the next 18 months?	Describes if any changes are expected to occur to that monitor at that station within the next 18 months.
Is it suitable for comparison against the annual PM2.5?	*40 CFR 58.30*: requires that $PM_{2.5}$ data that are representative, not of area-wide, but rather of relatively unique population-oriented micro-scale, localized hot spot, or unique population-oriented middle-scale impact sites are only eligible for comparison to the 24-hour $PM_{2.5}$ NAAQS.
Frequency of flow rate verification for manual PM samplers	*40 CFR 58, Appendix A, 3.3.2*: requires that a one-point flow rate verification check must be performed at least once every month for low-volume PM samplers and quarterly for hi-volume PM samplers.
Frequency of flow rate verification for automated PM analyzers	*40 CFR 58, Appendix A 3.2.3*: requires a one-point flow rate verification check must be performed at least once every month.
Frequency of one-point QC check for gaseous instruments	*40 CFR Part 58 Appendix A, 3.2.1*: requires that QC checks be performed at least once every two weeks.
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	*40 CFR Part 58 Appendix A, 3.2.2*: requires that SO_2, CO, O_3, and NO_2 monitors have annual performance evaluations. Section 3.2.7 requires that performance evaluations of PM monitors must be performed annually through the PEP (Performance Evaluation Program).
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	*40 CFR Part 58 Appendix A, 3.2.4 (automated methods) and 3.3.3 (manual methods)*: require that PM samplers have flow rate checks every six months.

Detailed Site Information for SLAMS and SPM Sites

Berkeley Aquatic Park (Near-road)

Site Name	Berkeley Aquatic Park
AQS ID	06-001-0013
GPS coordinates	37.864731, 122.302703
Location	Trailer within 50m east of Interstate 80
Address	1 Bolivar, Berkeley CA 94710
County	Alameda
Distance to road from gaseous probe (meters)	25 approximately based on latest siting plans
Traffic count (AADT, year)	263,000 (2013)
Groundcover	Gravel, grass, small plants.
Statistical Area	San Francisco-Oakland-Fremont CBSA

The Air District selected this road segment for near-road monitoring because it has the 5th highest Fleet Equivalent AADT (FE-AADT) in the Bay Area and is ranked #1 for traffic congestion by the Metropolitan Transportation Commission of the Bay Area. The four segments with higher FE-AADT than this segment are located along Highway 880 in Oakland where the Air District began monitoring on February 1, 2014 (Laney College). The Berkeley Aquatic Park site will be monitoring NO_2, CO, and $PM_{2.5,}$ Ultrafine Particulate Matter (UFP), Black Carbon (BC) and toxics, and is planned to open in the second half of 2015.

Berkeley Aquatic Park Monitor Information

Pollutant, POC	**NO, 1 / NO2, 1**	**CO, 1**	**PM2.5, 3**	**BC, 1**
Primary/QA Collocated/Other	Primary	N/A	Primary	N/A
Parameter code	42601 / 42602	42101	88101	84313
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	Public Information
Site type(s)	Source Oriented	Source Oriented	Source Oriented	Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS	Special Purpose
Network affiliation(s)	Near Road	Near Road	Near Road	N/A
Instrument manufacturer and model	TECO 42i	TECO 48i	Met One FEM BAM 1020	Teledyne API model 633
Method code	074	054	170	894
FRM/FEM/ARM/other	FRM	FRM	FEM	N/A
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Micro	Micro	Micro	Micro
Monitor start date	07/01/2014 est.	07/01/2014 est.	07/01/2014 est.	07/01/2014 est.
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01-12/31
Probe height (meters)	2-7 per EPA requirement	2-7 per EPA requirement	2-7 per EPA requirement	2-7 desired
Distance from supporting structure (meters)	>1 per EPA requirement	>1 per EPA requirement	>2 per EPA requirement	>1 desired
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	>10 per EPA requirement	>10 per EPA requirement	>10 per EPA requirement	>10 desired
Distance to furnace or incinerator flue (meters)	None	None	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	Site not open yet	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	≥270 per EPA requirement	≥270 per EPA requirement	≥270 per EPA requirement	≥270 desired
Probe material for reactive gases	Teflon	Teflon	N/A	N/A
Residence time for reactive gases (seconds)	None – Not operating yet	None – Not operating yet	N/A	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	Y	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-weekly	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	N/A	N/A
Date of Annual Performance Evaluation conducted in the **past calendar year** for gaseous parameters (MM/DD/YYYY)	None – site not open in 2014	None – site not open in 2014	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	None – site not open in 2014	N/A

Bethel Island

Site Name	Bethel Island
AQS ID	06-013-1002
GPS coordinates	38.006311, 121.641918
Location	Trailer in parking lot
Address	5551 Bethel Island Rd, Bethel Island, CA 94511
County	Contra Costa
Distance to road from gaseous probe (meters)	Bethel Island Rd: 63 Sandmound Blvd: 110
Traffic count (AADT, year)	Bethel Island Rd: 5,550 (2009) Sandmound Blvd: 1,537 (2009)
Groundcover	Gravel surrounded by grassy fields
Statistical Area	San Francisco-Oakland-Fremont CBSA

Bethel Island was chosen for air monitoring to measure pollutant transport between the Central Valley and the Bay Area. The site is 26 miles east of the only sea-level gap (the Carquinez Strait) between the two regions. Local pollution emissions are low due to the lack of any industrial sources within six miles of the site. The town of Bethel Island, 0.6 miles to the north, has a population of 2,137 according to the 2010 census. This site was operated by CARB from 1981 until late 1986 and then it was transferred to the Air District.

Ozone and NO/NO_2 are measured because the area is in the transport corridor between the San Francisco Bay Area and the Central Valley, both of which are major sources of ozone, ozone precursors, and particulates. Traffic volume near the site is low, so CO measurements tend to be representative of natural background levels, or regional transport. SO_2 is measured because the area is downwind from numerous refineries, which can be large sources of SO_2. PM_{10} is measured because easterly winds occasionally transport particulates from the Central Valley, and because the filters can be analyzed to determine sulfate and nitrate levels transported from the Central Valley.

Toxic compounds are determined from canister samples taken at Bethel Island on a 1:12 schedule and later analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report. During the most recent three years, this site recorded two exceedances of the national 8-hour ozone standard and no exceedances of the national standards for PM_{10}, NO_2, SO_2, or CO.

PM_{10} monitoring was changed from 1:6 to 1:12 sampling effective January 1, 2013. Because the Bay Area is well above the minimum monitoring requirements for PM_{10}, it was decided to convert PM_{10} monitoring from SLAMS to SPM, thus allowing a less frequent monitoring schedule due to limited resources. Therefore, this monitor is no longer counted in PM_{10} minimum monitoring requirements.

Bethel Island Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**
Primary/QA Collocated/Other	N/A	N/A	Primary
Parameter code	44201	42101	42601 / 42602
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Regional Transport & Highest Conc.	General Background	Regional Transport
Monitor type(s)	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i
Method code	047	054	074
FRM/FEM/ARM/other	FEM	FRM	FRM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District
Spatial scale	Urban	Urban	Urban
Monitor start date	03/01/1981	03/01/1981	03/01/1981
Current Sampling frequency	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	7	7	7
Distance from supporting structure (meters)	>1	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from trees (meters)	13	13	13
Distance to furnace or incinerator flue (meters)	None	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	12	13	14
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	10/28/2014	10/28/2014	10/28/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A

Bethel Island Monitor Information

Pollutant, POC	**SO2, 1**	**PM10, 1**
Primary/QA Collocated/Other	N/A	Primary
Parameter code	42401	81102
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Regional Transport	Regional Transport
Monitor type(s)	SLAMS	SPM
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	TECO 43i	Andersen GUV-16HBLA
Method code	060	063
FRM/FEM/ARM/other	FEM	FRM
Collecting Agency	Air District	Air District
Analytical Lab	N/A	Air District
Reporting Agency	Air District	Air District
Spatial scale	Urban	Neighborhood
Monitor start date	03/01/1981	11/05/1986
Current Sampling frequency	Continuous	1:12
Required Sampling frequency	N/A	N/A – No EE Flags - SPM
Sampling season	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	7	5
Distance from supporting structure (meters)	>1	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from trees (meters)	13	14
Distance to furnace or incinerator flue (meters)	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	No
Unrestricted airflow (degrees)	270	270
Probe material for reactive gases	Teflon	N/A
Residence time for reactive gases (seconds)	13	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	Quarterly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	10/28/2014	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	10/28/2014 05/20/2014

Concord

Site Name	Concord
AQS ID	06-013-0002
GPS coordinates	37.936013, 122.026154
Location	One story commercial building
Address	2956-A Treat Blvd, Concord CA 94518
County	Contra Costa
Distance to road from gaseous probe (meters)	Treat Blvd: 181 Oak Grove Rd: 244
Traffic count (AADT, year)	Treat Blvd: 35,013 (2013) Oak Grove Rd: 20,498 (2013)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Concord was chosen for air monitoring because it is the largest city in Contra Costa County, with a population of 122,067 according to the 2010 census; and because of the high pollution potential due to locally emitted and transported pollutants into the area. Since Concord is located in the Diablo Valley, locally emitted pollutants can become trapped when winds are light. Large emission sources in the valley include the two major freeways, Interstate 680 and California Highway 4; and two refineries at the north end of the valley.

The air monitoring site is located in the back of a shopping center, near the intersection of two major streets, and surrounded by residential neighborhoods. There is no industry in the immediate vicinity. NO/NO_2 is measured because of local mobile emissions. Ozone is measured at the site because hot, inland summertime temperatures combined with precursor pollutants stagnating in the surrounding valley often produces high ozone levels. Carbon monoxide is measured because the site is near two major roads, Treat Blvd and Oak Grove Road. SO_2 is measured because the site is six miles south of the Tesoro and the Shell Refineries, both potential major sources of SO_2. PM_{10} and $PM_{2.5}$ are measured because light winds combined with surface-based inversions during the winter months can cause elevated particulate levels in the valley.

VOC toxic compounds are sampled at Concord on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

During the most recent three years, this site recorded four exceedances of the national 8-hour ozone standard, one exceedance of the national 24-hour $PM_{2.5}$ standard, and no exceedances of the national standards for $PM_{10,}$ $NO_{2,}$ SO_2, or CO.

Concord Monitor Information

Pollutant, POC	O3, 1	CO, 1	NO, 1 / NO2, 1	SO2, 1
Primary/QA Collocated/Other	N/A	N/A	Primary	N/A
Parameter code	44201	42101	42601 / 42602	42401
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure & Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	TECO 43i
Method code	047	054	074	060
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	04/09/1980	02/21/1980	NO2: 02/21/1980 NO: 03/01/1980	02/21/1980
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	9	9	9	9
Distance from supporting structure (meters)	>1	>1	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	24	24	24	24
Distance to furnace or incinerator flue (meters)	None	None	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	10	11	12	12
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	07/24/2014	07/24/2014	07/24/2014	07/24/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A	N/A

Concord Monitor Information

Pollutant, POC	**PM10, 1**	**PM2.5, 3**
Primary/QA Collocated/Other	Primary	Primary
Parameter code	81102	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure & Highest Conc.
Monitor type(s)	SPM	SLAMS
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	Andersen HiVol 1200	Met One BAM 1020
Method code	063	170
FRM/FEM/ARM/other	FRM	FEM
Collecting Agency	Air District	Air District
Analytical Lab	Air District	N/A
Reporting Agency	Air District	Air District
Spatial scale	Urban	Urban
Monitor start date	11/04/1986	1/1/2013
Current Sampling frequency	1:12	Continuous
Required Sampling frequency	N/A – No EE Flags - SPM	N/A
Sampling season	01/01-12/31	01/01-12/31
Probe height (meters)	6	6
Distance from supporting structure (meters)	>2	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from trees (meters)	15	22
Distance to furnace or incinerator flue (meters)	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	No	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	Y
Frequency of flow rate verification for manual PM samplers	Quarterly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	07/23/2014 01/13/2014	07/23/2014 01/13/2014

Crockett

Site Name	Crockett
AQS ID	06-013-1001
GPS coordinates	38.054920, 122.233229
Location	Pump house
Address	End of Kendall Avenue, Crockett CA 94525
County	Contra Costa
Distance to road from gaseous probe (meters)	San Pablo Ave: 68
Traffic count (AADT, year)	San Pablo Ave: 2,797 (2013)
Groundcover	Vegetative
Statistical Area	San Francisco-Oakland-Fremont CBSA

Crockett was chosen for SO_2 source oriented monitoring because it is downwind of the Phillips 66 Refinery. Prevailing winds in the area are from the west, which transport SO_2 emissions from the refinery over the town of Crockett, a predominately residential community with a population of 3,094 according to the 2010 census. The monitoring site is located on the west side of Crockett 0.9 miles northeast of the refinery boundary. The only other major industry near Crockett is C&H Sugar, which is not a significant source of SO_2 emissions.

VOC toxic compounds are sampled at Crockett on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

Crockett is classified as an SPM site. EPA siting criteria require the probe be located at least 10 meters from the drip line of all trees within the 180 degree arc of unrestricted airflow for source oriented monitoring as determined by the predominant wind direction and the direction of the refinery. The closest tree drip line within the 180 degree arc is less than 10 meters from the probe, which does not meet siting criteria. The Air District has been unable to negotiate with the local homeowner's association for the removal of this tree. Even though the siting criteria for a SLAMS site cannot be met, the site is still suitable for source oriented monitoring as an SPM site.

SO_2 concentrations measured at Crockett did not exceed the national 1-hour 75 ppb standard during the last three years.

Crockett Monitor Information

Pollutant, POC	**SO2, 1**
Primary/QA Collocated/Other	N/A
Parameter code	42401
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population Exposure & Source Oriented
Monitor type(s)	SPM
Network affiliation(s)	N/A
Instrument manufacturer and model	TECO 43C
Method code	060
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitor start date	01/01/1979
Current Sampling frequency	Continuous
Required Sampling frequency	N/A
Sampling season	01/01 – 12/31
Probe height (meters)	6
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	1
Distance to furnace or incinerator flue (meters)	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	270
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	10
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	10/24/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

Fairfield

Site Name	Fairfield
AQS ID	06-095-0005
GPS coordinates	38.227066, 122.075624
Location	Small trailer in open field
Address	1010 Chadbourne Rd, Fairfield CA 94534
County	Solano
Distance to road from gaseous probe (meters)	Cordelia Rd: 194 Chadbourne Rd: 705
Traffic count (AADT, year)	Cordelia Rd: 2,145 (2011) Chadbourne Rd: 2,547 (2011)
Groundcover	Vegetative
Statistic Area	Vallejo-Fairfield CBSA

Fairfield was chosen for monitoring ozone transport between the San Francisco Bay Area and the Sacramento Valley. Fairfield lies in the northeast part of the Air District in the Carquinez Strait Region, the only sea level gap between the Bay Area and the Central Valley. Prevailing westerly winds carry ozone and its precursors from the Bay Area to the Sacramento Valley.

The monitoring site is located in a rural area between Fairfield/Suisun City and the greater Bay Area. Prevailing winds are westerly during the summer season. Therefore, the monitor normally measures ozone concentrations coming from the Bay Area. Occasionally easterly winds transport ozone from the Central Valley to Fairfield and the Bay Area.

Over the past decade the Fairfield/Suisun City area has grown considerably. According to the 2010 census the area has a combined population of 138,815, the largest urban area in Solano County. As a result, Fairfield is also a population exposure ozone monitoring site.

Ozone concentrations measured at Fairfield exceeded the national 8-hour ozone standard on one day during the last three years.

Fairfield Monitor Information

Pollutant, POC	**O3, 1**
Primary/QA Collocated/Other	N/A
Parameter code	44201
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population Exposure & Regional Transport & Max. Ozone Conc.[a]
Monitor type(s)	SLAMS
Network affiliation(s)	N/A
Instrument manufacturer and model	TECO 49i
Method code	047
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Urban
Monitor start date	05/29/2002
Current Sampling frequency	Continuous
Required Sampling frequency	N/A
Sampling season	04/01-11/30
Probe height (meters)	4
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	>50
Distance to furnace or incinerator flue (meters)	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	6
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	11/04/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

a Fairfield is highest in the Vallejo – Fairfield CBSA within the BAAQMD. Vacaville is the highest in the Vallejo – Fairfield CBSA and is in the Yolo-Solano AQMD.

Forest Knolls

Site Name	Forest Knolls
AQS ID	06-041-2001
GPS coordinates	38.015136, 122.689531
Location	Roof
Address	6 Castro Street
County	Marin
Distance to road from probe (meters)	Sir Francis Drake Blvd: 14 Montezuma Road: 48 Castro St: 6 Arroyo Rd: 316
Traffic count (AADT, year)	Sir Francis Drake Blvd: 2370 (2007) Montezuma Road: < 300 (est. 2013) Castro St: <300 (est. 2013) Arroyo Rd: <300 (est. 2013)
Groundcover	Paved
Statistic Area	San Francisco-Oakland-Fremont CBSA

Forest Knolls was chosen for monitoring Black Carbon (BC) due to community interest about wood smoke in the San Geronimo Valley and to better understand and characterize the wood smoke source category in sheltered valley locations where winter wood burning often is the primary source of home heating. The site will address independent monitoring done using non-FEM/FRM/ARM instruments that indicated valley areas may be more prone to variable localized impacts that are difficult to capture and characterize. Lagunitas-Forest Knolls is considered a Census Designated Place (CDP) with a population of 1,819 based on the 2010 census.

The monitoring site is located in a semi-rural west to east valley about 10 miles west to northwest of San Rafael. Wintertime meteorological conditions are frequently conducive to trapping wood smoke in the valley, particularly during cold, still evenings. Many of the homes do not have residential gas for heating and, therefore, burn wood. Wood smoke may become trapped in the valley at all times of year, although winter is believed to have the largest concentration of wood smoke.

Forest Knolls Monitor Information

Pollutant, POC	**BC, 1**
Primary/QA Collocated/Other	N/A
Parameter code	84313
Basic monitoring objective(s)	Public Information
Site type(s)	Population Exposure
Monitor type(s)	SPM
Network affiliation(s)	N/A
Instrument manufacturer and model	Teledyne API AE-633
Method code	894
FRM/FEM/ARM/other	N/A
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitor start date	01/16/2013
Current Sampling frequency	Continuous
Required Sampling frequency	N/A
Sampling season	01/01-12/31
Probe height (meters)	5
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	4
Distance to furnace or incinerator flue (meters)	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

Fort Cronkhite

Site Name	Fort Cronkhite
AQS ID	06-041-0004
GPS coordinates	37.832725, 122.527658
Location	At ground level behind a ranger residence
Address	Building 1111, Fort Cronkhite, Sausalito CA
County	Marin
Distance to road from probe (meters)	Bunker Road: 16
Traffic count (AADT, year)	Bunker Road: 948 (2007)
Groundcover	Vegetative
Statistical Area	San Francisco-Oakland-Fremont CBSA

Fort Cronkhite was chosen for an air toxics monitoring site because it is representative of ambient levels of toxics compounds transported into the Bay Area from the Pacific Ocean due to prevailing westerly winds. The site is ½ mile east of the Pacific Ocean, on the north side of the Golden Gate gap which opens into San Francisco Bay. The monitor is located within the Golden Gate National Recreation Area (GGNRA) near the visitor center at Fort Cronkhite. Low concentrations of toxics from this site provide a baseline to compare other toxics measurements in the Bay Area.

Toxics concentrations measured at this site should not be considered to be at pristine natural background levels. There are toxics contributions from emissions transported across the Pacific Ocean from Asia, from ships headed to and from the Bay Area and Central Valley ports, and from ships sailing along the coast. Additionally, there can be a small contribution from vehicle traffic in areas upwind of the site within the GGNRA. In spite of these contributions, when winds are from the west, the toxics levels at this site reflect the lowest levels in the Bay Area.

The closest industrial sources are in San Francisco about eight miles southeast of the site. The closest towns are Sausalito, three miles to the east northeast with a population of 7,061, and Marin City, three miles to the northeast with a population of 2,666 based on the 2010 census. Sausalito and Marin City have little impact on the monitoring site because winds are typically from the west so the site is upwind of these towns, and the towns have no significant industrial sources.

This site is operated as part of the Air District's Toxics Program with samples taken on a 1:12 schedule. Samples are collected using a Xontech canister and are analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

Fort Cronkhite Monitor Information

Pollutant, POC	**Toxics, 3**
Primary/QA Collocated/Other	N/A
Parameter code	See toxics section
Basic monitoring objective(s)	Research
Site type(s)	General / Background
Monitor type(s)	SPM
Network affiliation(s)	N/A
Instrument manufacturer and model	Xontech 910A
Method code	210
FRM/FEM/ARM/other	N/A
Collecting Agency	Air District
Analytical Lab	Air District
Reporting Agency	Air District
Spatial scale	Regional
Monitor start date	03/26/1987
Current Sampling frequency	1:12
Required Sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	7
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	20
Distance to furnace or incinerator flue (meters)	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Glass
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

Gilroy

Site Name	Gilroy
AQS ID	06-085-0002
GPS coordinates	36.999571, 121.574684
Location	Air monitoring shelter next to water pump station
Address	9th and Princevalle St, Gilroy, CA 95020
County	Santa Clara
Distance to road from gaseous probe (meters)	Princevalle St: 18 9th St: 16 10th St. 185
Traffic count (AADT, year)	Princevalle St: 5,000 (2008) 9th St: 1,400 (est. 2013) 10th St. 12,700 (2008)
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

Gilroy was chosen for air monitoring to measure ozone and particulate transport between the San Francisco and Monterey Bay Areas. Prevailing northwesterly afternoon winds carry ozone and ozone precursors from the San Jose area southward through the Santa Clara Valley. When temperatures are hot, and solar insolation is strong, these precursors react and can form high concentrations of ozone in the Gilroy area. As Gilroy grew in population (48,821 according to the 2010 census) the site was considered not only a regional ozone transport site but also a population exposure ozone site. $PM_{2.5}$ is measured because light winds combined with surface-based inversions during the winter months can cause elevated particulate levels in the valley.

The monitoring site is located in a residential area of Gilroy on the west side of the Santa Clara Valley. Air quality studies have shown that the west side of the valley has higher ozone levels than the east side. This is due to elevated terrain on the west side that shelters the western part of Gilroy from the strong winds in the afternoon produced by the Monterey Bay sea breeze. Residents have preferred the sheltered area and built most of the town on the west side of the valley.

In the most recent three years, the national 8-hour ozone standard and the national 24-hour $PM_{2.5}$ standard were never exceeded.

Gilroy Monitor Information

Pollutant, POC	**O3, 1**	**PM2.5, 3**
Primary/QA Collocated/Other	N/A	Primary
Parameter code	44201	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure & Regional Transport	Population Exposure & Regional Transport
Monitor type(s)	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	TECO 49i	Met One FEM BAM 1020
Method code	047	170
FRM/FEM/ARM/other	FEM	FEM
Collecting Agency	Air District	Air District
Analytical Lab	N/A	N/A
Reporting Agency	Air District	Air District
Spatial scale	Neighborhood	Neighborhood
Monitor start date	07/01/1980	10/31/2009
Current Sampling frequency	Continuous	Continuous
Required Sampling frequency	N/A	N/A
Sampling season	04/01-11/30	01/01 - 12/31
Probe height (meters)	5	4
Distance from supporting structure (meters)	>1	No supporting structure / ground level
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	N/A
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	N/A	1.8[a]
Distance from trees (meters)	26	26
Distance to furnace or incinerator flue (meters)	14	14
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	Teflon	N/A
Residence time for reactive gases (seconds)	17	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	11/13/2014	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	11/13/2014 04/15/2014

a The $PM_{2.5}$ monitor is outdoors, ground based. The probe is 3m above ground. A nearby shelter is 1.8m away and is the eve of the shelter is 0.12m above the probe height. This is not an obstruction because the probe is more than twice the distance that the eve extends above the probe. The shelter has a slanted roof that peaks at a height of 3.99m. The probe is 3.9m away from the roof peak which is 0.99m above the probe. This is not an obstruction because the probe is more than twice the distance that the roof peak extends above the probe.

Hayward

Site Name	Hayward
AQS ID	06-001-2001
GPS coordinates	37.654456, 122.031547
Location	Pump house near water tank
Address	3466 La Mesa Drive, Hayward, CA 94542
County	Alameda
Distance to road from gaseous probe (meters)	Hayward Blvd: 26 La Mesa Dr: 38 Farmhill Drive: 205
Traffic count (AADT, year)	Hayward Blvd: 4,293 (2010) La Mesa Drive: 500 (est. 2012) Farmhill Drive: 2,500 (<2006)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

The Hayward air monitoring site was chosen to measure ozone at a higher elevation. The city of Hayward has a population of 144,186 according to the 2010 census. Located on the east side of Hayward at an elevation of 951 feet, it is the highest elevation ozone monitoring site in the Air District. Studies had shown that on high ozone days, a cloud of ozone and ozone precursors moves southward from Oakland on the west side of the East Bay Hills.

Because ozone monitoring sites were already in place in the low-lying areas of the East and South Bay, i.e. in Oakland and San Jose, this site was chosen to be between them, but at a higher elevation. Thus, the site gives an indication of ozone levels aloft and sub-regional transport. The Hayward site is also important because it provides air quality forecasting information concerning residual ozone from the previous day. Although there is a large water tank onsite in the upwind direction, the instrument probe is high enough to avoid the tank being an obstacle.

During the last three years, no exceedances of the national 8-hour ozone were measured at Hayward.

Hayward Monitor Information

Pollutant, POC	**O3, 1**
Primary/QA Collocated/Other	N/A
Parameter code	44201
Basic monitoring objective(s)	NAAQS comparison & Research
Site type(s)	Other (Sub-Regional Transport) & Population Exposure
Monitor type(s)	SLAMS
Network affiliation(s)	N/A
Instrument manufacturer and model	TECO 49i
Method code	047
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Urban
Monitor start date	05/31/1977
Current Sampling frequency	Continuous
Required Sampling frequency	N/A
Sampling season	04/01-11/30
Probe height (meters)	7
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	11
Distance to furnace or incinerator flue (meters)	N/A
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	15
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	11/07/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

Laney College (Near-road)

Site Name	Laney College
AQS ID	06-001-0012
GPS coordinates	37.793624, 122.263376
Location	Trailer east of Interstate 880
Address	Laney College 8th St. parking lot Aisle J, Oakland, CA 94607
County	Alameda
Distance to road from gaseous probe (meters)	20
Traffic count (AADT, year)	Interstate 880: 216,000 (2013)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

The Air District began monitoring pollutants at this site on February 1, 2014. The site is along a segment of roadway with the second highest Fleet Equivalent AADT (FE-AADT) in the Bay Area. The roadway segment with the highest FE-AADT in the Bay Area was not suitable for monitoring because it was near train tracks and no access was permitted across the easement by the land owner (Union Pacific) due to safety concerns. The site is in Oakland which is the largest city in Alameda County, with a population of 390,724 according to the 2010 census.

This site monitors NO/NO_2, CO, and $PM_{2.5,}$ Ultrafine Particulate Matter (UFP), Black Carbon (BC) and toxics. $PM_{2.5}$ monitoring at this site is considered representative of area-wide concentrations within this major metropolitan region and are comparable to nearby neighborhood scale (Oakland West) and middle scale (Oakland) $PM_{2.5}$ monitoring locations in the city of Oakland. Figure 4 on Page 18 shows a diagram comparing $PM_{2.5}$ measured at Laney College and Oakland West with a correlation of 0.92 between February 1, 2014 and February 28, 2015. The Air District will continue to evaluate this comparison in our Annual Network Plan next year.

The site type for NO/NO_2, CO, and $PM_{2.5}$ in AQS and in the accompanying tables has been updated since our last annual plan from source oriented to source oriented and population exposure based on the similarity in pollutant concentration with other nearby measurements. The site is within ¼ mile of residential and commercial areas in Oakland.

Laney College Monitor Information

Pollutant, POC	**NO, 1 / NO2, 1**	**CO, 1**	**PM2.5, 3**	**BC, 1**
Primary/QA Collocated/Other	Primary	N/A	Primary	N/A
Parameter code	42601 / 42602	42101	88101	84313
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	Public Information
Site type(s)	Source Oriented & Population Exposure	Source Oriented & Population Exposure	Source Oriented & Population Exposure	Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS	SPM
Network affiliation(s)	Near Road	Near Road	Near Road	N/A
Instrument manufacturer and model	TECO 42i	TECO 48i	Met One FEM BAM 1020	Teledyne API AE-633
Method code	074	054	170	894
FRM/FEM/ARM/other	FRM	FRM	FEM	N/A
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Micro	Micro	Micro	Micro
Monitor start date	02/01/2014	02/01/2014	02/01/2014	02/01/2014
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01-12/31
Probe height (meters)	6	6	5	5
Distance from supporting structure (meters)	>1	>1	>2	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	None	None	None	None
Distance to furnace or incinerator flue (meters)	None	None	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	No	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	N/A	N/A
Residence time for reactive gases (seconds)	16	16	N/A	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	Y	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-weekly	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	08/12/2014	08/12/2014	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	08/12/2014 03/10/2014	N/A

Livermore

Site Name	Livermore
AQS ID	06-001-0007
GPS coordinates	37.687526, 121.784217
Location	One story commercial building
Address	793 Rincon Avenue, Livermore, CA 94551
County	Alameda
Distance to road from gaseous probe (meters)	Rincon Ave: 67 Pine St: 94 Interstate 580: 1,320 Portola Ave: 722
Traffic count (AADT, year)	Rincon Ave: 3,091 (2013) Portola Ave: 18,295 (2012) Pine St: 4,263 (2013) Interstate 580: 182,000 (2013)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Livermore was chosen for air monitoring because it is the largest city in eastern Alameda County, with a population of 80,968 according to the 2010 census. Past measurements have shown this area to have the highest ozone levels in the Bay Area. Livermore is located within the Livermore Valley, an east-west oriented inland valley between the San Francisco Bay and the Central Valley. Wind analyses of high ozone days show ozone precursors moving to this valley from the Hayward and Niles Canyon Gaps to the west, and from the San Ramon Valley to the north. The air monitoring site is west of the city center, in a residential neighborhood. The station is in a small one-story shopping center, with a little-used parking lot in front of the station and a city park behind it.

There are no industrial sources in the immediate vicinity of the site. Ozone and its precursors and NO/NO_2, are measured because the area is downwind of large sources of ozone precursors. $PM_{2.5}$ is measured because light winds combined with surface-based inversions during the winter months can cause elevated particulate levels. Black Carbon (BC) is measured to better determine the composition and relationship between BC and $PM_{2.5}$.

VOC toxic compounds are sampled at Livermore on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

The Livermore site is part of a Bay Area Photochemical Assessment Monitoring Stations (PAMS) program. This is a program to measure hourly speciated hydrocarbons using a gas chromatograph analyzer at three Bay Area locations. The other two locations are San Ramon and Patterson Pass. A full description of the PAMS program can be found in the PAMS section of this document.

During the most recent three years, this site recorded eight exceedances of the national 8-hour ozone standard, five exceedances of the national 24-hour $PM_{2.5}$ standard, and no exceedances of the national NO_2 standard.

Livermore Monitor Information

Pollutant, POC	**O3, 1**	**NO, 1 / NO2, 1**	**PM2.5, 3**
Primary/QA Collocated/Other	N/A	Primary	Primary
Parameter code	44201	42601 / 42602	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison & Research	NAAQS comparison
Site type(s)	Population Exposure & Max. Ozone Conc.	Population Exposure	Population Exposure & Highest Conc.
Monitor type(s)	SLAMS	SLAMS	SLAMS
Network affiliation(s)	Unofficial PAMS	Unofficial PAMS	N/A
Instrument manufacturer and model	TECO 49i	TECO 42i	Met One FEM BAM 1020
Method code	047	074	170
FRM/FEM/ARM/other	FEM	FRM	FEM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	Air District	Air District	Air District
Reporting Agency	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitor start date	01/01/2000	NO2:12/31/1999 NO: 01/01/2000	03/01/2011
Current Sampling frequency	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	6	6	5
Distance from supporting structure (meters)	>1	>1	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from trees (meters)	51	51	52
Distance to furnace or incinerator flue (meters)	16	16	21
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	13	13	N/A
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	07/30/2014	07/30/2014	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	07/28/2014 01/27/2014

Livermore Monitor Information

Pollutant, POC	**Speciated PM2.5, 5**	**BC, 1**
Primary/QA Collocated/Other	Other	N/A
Parameter code	88502 (pm mass) – many others see SASS section	84313
Basic monitoring objective(s)	Research	Research
Site type(s)	Population Exposure	Population Exposure
Monitor type(s)	SPM	SPM
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	Met One SASS	Teledyne API AE-633
Method code	810	894
FRM/FEM/ARM/other	N/A	N/A
Collecting Agency	Air District	Air District
Analytical Lab	DRI	N/A
Reporting Agency	DRI	Air District
Spatial scale	Neighborhood	Neighborhood
Monitor start date	06/11/2008	01/01/2012
Current Sampling frequency	1:6	Continuous
Required Sampling frequency	N/A	N/A
Sampling season	01/01 - 12/31	01/01-12/31
Probe height (meters)	5	6
Distance from supporting structure (meters)	>2	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from trees (meters)	55	52
Distance to furnace or incinerator flue (meters)	17	17
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N	N/A
Frequency of flow rate verification for manual PM samplers	Monthly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	07/28/2014 01/27/2014	N/A

Los Gatos

Site Name	Los Gatos
AQS ID	06-085-1001
GPS coordinates	37.226862, 121.979675
Location	Top of fire station's hose drying tower
Address	306 University Ave, Los Gatos, CA 95030
County	Santa Clara
Distance to road From gaseous probe (meters)	University Ave: 37 Bentley Ave: 27 State Route 17: 291 State Route 9: 121
Traffic count (AADT, year)	University Ave: 10,308 (2014) Bentley Ave: 500 (est. 2015) State Route 17: 65,000 (2013) State Route 9: 34,500 (2013)
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

Los Gatos was chosen for ozone monitoring because prevailing northerly winds transport ozone and ozone precursors from the densely populated area around the south Bay Area to the west side of the Santa Clara Valley.

High ozone levels are in part due to Los Gatos being situated at the base of the Santa Cruz Mountains, which act as a barrier to the movement of polluted air. The monitoring site is located near the downtown area at a fire station surrounded by residential neighborhoods. The city of Los Gatos has a population of 29,413 according to the 2010 census.

In the most recent three years, this site recorded one exceedance of the national 8-hour ozone standard.

Los Gatos Monitor Information

Pollutant, POC	**O3, 1**
Primary/QA Collocated/Other	N/A
Parameter code	44201
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population Exposure
Monitor type(s)	SLAMS
Network affiliation(s)	N/A
Instrument manufacturer and model	TECO 49i
Method code	047
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitor start date	04/01/1972
Current Sampling frequency	Continuous
Required Sampling frequency	N/A
Sampling season	04/01 – 11/30
Probe height (meters)	11.0
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	N/A
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	N/A
Distance from trees (meters)	16
Distance to furnace or incinerator flue (meters)	4
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	11
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Daily
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	11/06/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

Martinez

Site Name	Martinez
AQS ID	06-013-2001
GPS coordinates	38.012816, 122.134467
Location	Small sampling shelter next to fire station
Address	521 Jones St, Martinez, CA 94553
County	Contra Costa
Distance to road from gaseous probe (meters)	Jones St: 22 Alhambra Ave: 19
Traffic count (AADT, year)	Jones St: 2,000 (2008) Alhambra Ave: 9,800 (2008)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Martinez was chosen for SO_2 source oriented monitoring because the Shell and Tesoro oil refineries are located in north and east sections of the city. The Carquinez Strait boarders the city to the north and the prevailing winds are from the west. However, north and east winds can transport SO_2 emissions from the refineries over populated areas of the city.

The monitoring site is located near downtown Martinez and is 0.5 miles south of the Shell Refinery and 2.5 miles west of the Tesoro Refinery. According to the 2010 census, Martinez has a 2010 population of 35,824. There are no industrial activities or SO_2 sources nearby other than the refineries.

VOC toxic compounds are sampled at Martinez on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

SO_2 concentrations measured at Martinez did not exceed the national 1-hour 75-ppb standard during the last three years.

Martinez Monitor Information

Pollutant, POC	**SO2, 1**
Primary/QA Collocated/Other	N/A
Parameter code	42401
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population Exposure & Source Oriented
Monitor type(s)	SLAMS
Network affiliation(s)	N/A
Instrument manufacturer and model	TECO 43C
Method code	060
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitor start date	07/02/1973
Current Sampling frequency	Continuous
Required Sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	7
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	11
Distance to furnace or incinerator flue (meters)	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	12
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	07/09/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

Napa

Site Name	Napa
AQS ID	06-055-0003
GPS coordinates	38.310942, 122.296189
Location	One story commercial building
Address	2552 Jefferson Street, Napa ,CA 94558
County	Napa
Distance to road from gaseous probe (meters)	Jefferson St: 16 Brown St: 79 Lincoln Ave: 283 Central Ave: 122
Traffic count (AADT, year)	Jefferson St: 19,143 (2007) Brown St: 3,392 (2008) Lincoln St: 23,061 (2004) Central Ave: 2,927 (2007)
Groundcover	Paved
Statistical Area	Napa CBSA

Napa was chosen for air monitoring because it is the largest city in Napa County with a population of 76,915 according to the 2010 census. The city is located in the center of Napa Valley where agricultural burning and fireplace usage during the fall and winter can result in high particulate levels. In summer months, Napa can have elevated ozone levels when central Bay Area ozone precursors are transported north to the city. The site will be closed and a new site will open at Napa College during the 2nd half of 2015.

The air monitoring site is situated about a mile north of downtown Napa in a mixed residential and commercial neighborhood. There are no industrial sources in the immediate vicinity. Ozone and NO/NO_2 are measured because southerly winds carry ozone and its precursors into Napa. The Napa ozone monitor is classified as middle scale based on the nearby traffic count and distance between the monitor and the roadway (per 40 CFR Part 58). However, data is representative at neighborhood spatial scale per waiver from EPA Region 9 (see page 17 for details). Therefore, the Air District considers this monitor to be comparable to the NAAQS.

Carbon monoxide is measured because the Napa Valley is a major tourist attraction with resulting high traffic volumes through the city. PM_{10} and continuous $PM_{2.5}$ are measured because of agricultural and household wood burning.

VOC toxic compounds are sampled at Napa on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

$PM_{2.5}$ is measured using a FEM BAM which began operation on December 13, 2012. The FEM BAM is classified as middle scale based on its distance from the roadway and nearby traffic volume. The Air District considers this monitor to be comparable to the NAAQS because the monitor is representative of area-wide $PM_{2.5}$ concentrations in the Napa CBSA.

During the most recent three years, this site recorded one exceedance of the national 8-hour ozone standard but no exceedances of the national standards for PM_{10}, NO_2 or CO. The $PM_{2.5}$ FEM BAM recorded one exceedance of the national 24-hour $PM_{2.5}$ standard since it was deployed on December 13, 2012.

Napa Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**
Primary/QA Collocated/Other	N/A	N/A	Primary
Parameter code	44201	42101	42601 / 42602
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure & Max. Ozone Conc.	Population Exposure	Population Exposure
Monitor type(s)	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i
Method code	047	054	074
FRM/FEM/ARM/other	FEM	FRM	FRM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District
Spatial scale	Neighborhood per EPA waiver (see p17)	Middle	Middle
Monitor start date	07/01/1976	07/01/1973	07/01/1973
Current Sampling frequency	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	9	9	9
Distance from supporting structure (meters)	>1	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from trees (meters)	25	25	25
Distance to furnace or incinerator flue (meters)	6	6	6
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	10	7	9
Will there be changes within the next 18 months?	Yes[a]	Yes[a]	Yes[a]
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	08/07/2014	08/07/2014	08/07/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A

a The site will be closing and a new site will open at Napa College during the 2nd half of 2015.

Napa Monitor Information

Pollutant, POC	**PM10, 1**	**PM10, 2**	**PM2.5, 3**
Primary/QA Collocated/Other	Primary	QA Collocated	Primary
Parameter code	81102	81102	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Quality Assurance	Population Exposure & Highest Conc.
Monitor type(s)	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A
Instrument manufacturer and model	Tisch Env. HiVol TE-6000	Tisch Env. HiVol TE-6000	Met One FEM BAM 1020
Method code	141	141	170
FRM/FEM/ARM/other	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	Air District	Air District	N/A
Reporting Agency	Air District	Air District	Air District
Spatial scale	Middle	Middle	Middle
Monitor start date	11/04/1986	06/08/2004	12/13/2012
Current Sampling frequency	1:6	1:6	Continuous
Required Sampling frequency	1:6 – No EE Flags	1:12 – No EE Flags	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01-12/31
Probe height (meters)	6	6	6
Distance from supporting structure (meters)	>2	>2	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from trees (meters)	21	18	26
Distance to furnace or incinerator flue (meters)	5	4	9
Distance between monitors fulfilling a QA collocation requirement (meters)	3.4	3.4	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	No	No	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	N/A	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A	N/A
Will there be changes within the next 18 months?	Yes[a]	Yes[a]	Yes[a]
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	Quarterly	Quarterly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	N/A	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	08/06/2014 02/19/2014	08/06/2014 02/19/2014	08/06/2014 02/19/2014

a The site will be closing and a new site will open at Napa College during the 2nd half of 2015.

Oakland

Site Name	Oakland
AQS ID	06-001-0009
GPS coordinates	37.743065, 122.169935
Location	Two-story commercial building
Address	9925 International Blvd, Oakland, CA 94603
County	Alameda
Distance to road from gaseous probe (meters)	International Blvd: 19 98th St: 43 99th St: 23
Traffic count (AADT, year)	International Blvd: 21,988 (2011) 98th St: 31,340 (<2006) 99th St: 100 (2008)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Oakland is an important area for air pollution monitoring because it is the largest city in Alameda County, with a population of 390,724 according to the 2010 census. It has large emission sources within its boundaries, such as a major maritime port, an international airport, extensive areas of industry, and a number of major freeways. These sources have the potential to emit significant amounts of CO and ozone precursors, as well as particulates and toxic compounds.

The monitoring site is located seven miles southeast of downtown Oakland, on a commercial strip in a residential area. Ozone and NO/NO_2 are measured to monitor population exposure to these pollutants. Carbon monoxide is measured because of the high volume of traffic in the city, which includes several major freeways. $PM_{2.5}$ is measured due to the large emission sources in the area, and because light winds combined with wood burning, vehicular traffic, and surface-based inversions during winter can cause elevated particulate concentrations.

The monitoring scale for ozone is middle scale. Following an EPA Region 9 review of the distance between the gaseous probe and the roadway, and the corresponding traffic count, EPA Region 9 suggested this monitor be changed from SLAMS to SPM and the Air District agreed to the change. Consequently, this monitor cannot be used toward meeting the minimum monitoring requirements for ozone.

The $PM_{2.5}$ FEM BAM is middle scale based on the monitors distance from the roadway and nearby traffic count. The Air District considers this monitor to be comparable to the NAAQS because the monitor is representative of area wide emissions.

VOC toxic compounds are sampled at Oakland on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

During the most recent three years, the national 24-hour $PM_{2.5}$ standard was exceeded on three days. No exceedances of the national standards for Ozone, NO_2 or CO were measured during the last three years.

Oakland Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**	**PM2.5, 3**
Primary/QA Collocated/Other	N/A	N/A	Primary	Primary
Parameter code	44201	42101	42601 / 42602	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type(s)	SPM	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	API 300E	TECO 42i	Met One FEM BAM 1020
Method code	047	093	074	170
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Middle	Middle	Middle	Middle
Monitor start date	11/01/2007	11/01/2007	11/01/2007	10/01/2009
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	10	10	10	7
Distance from supporting structure (meters)	>1	>1	>1	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	21	21	21	21
Distance to furnace or incinerator flue (meters)	8	8	8	5
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	13	14	15	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	10/30/2014	10/30/2014	10/30/2014	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A	10/30/2014 06/11/2014

Oakland West

Site Name	Oakland West
AQS ID	06-001-0011
GPS coordinates	37.814781, 122.282347
Location	Shelter in parking lot
Address	1100 21st St, Oakland, CA 94607
County	Alameda
Distance to road from gaseous probe (meters)	Grand Ave: 34 Linden St: 33 Adeline St: 168 21st St: 80
Traffic count (AADT, year)	Grand Ave: 19,796 (2012) Linden St: 500 (2012) Adeline St: 7,586 (2012) 21st St: 600 (2012)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

The Air District opened a monitoring station one mile downwind of the Port of Oakland in February 2009 because the Port of Oakland is considered a major area source of diesel particulate matter emissions. Studies have shown that the West Oakland community is exposed to higher concentrations of diesel particulate matter than elsewhere in the Bay Area, resulting in higher potential cancer risks. This site is one of the forty nationwide sites for community monitoring of NO_2 in areas with susceptible and vulnerable populations.

Carbon monoxide, NO/NO_2, and $PM_{2.5}$ are measured to determine the impact of emissions from the Port of Oakland and its associated diesel-truck traffic, and vehicle traffic from nearby highways. SO_2 is measured to determine the impact of emissions from ship traffic. Black Carbon (BC) is measured to better determine the composition and relationship between BC and $PM_{2.5}$.

VOC toxic compounds are sampled at Oakland West on a 1:12 schedule, and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

Since $PM_{2.5}$ FEM BAM monitoring began on December 18, 2012, this site recorded three exceedances of the national 24-hour $PM_{2.5}$ standard. No national exceedances of the national standards for Ozone, NO_2, SO_2, or CO were measured during the past three years.

Oakland West Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**	**SO2, 1**
Primary/QA Collocated/Other	N/A	N/A	Primary	N/A
Parameter code	44201	42101	42601 / 42602	42401
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure & Source Oriented	Population Exposure & Source Oriented	Population Exposure & Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	TECO 43i
Method code	047	054	074	060
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Middle	Neighborhood	Neighborhood
Monitor start date	12/13/2010	02/25/2009	02/25/2009	02/25/2009
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	6	6	6	6
Distance from supporting structure (meters)	>1	>1	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	40	40	40	40
Distance to furnace or incinerator flue (meters)	None	None	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	10	10	11	10
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	11/21/2014	11/21/2014	11/21/2014	11/21/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A	N/A

Oakland West Monitor Information

Pollutant, POC	**PM2.5, 3**	**Speciated PM2.5, 5**	**BC, 1**
Primary/QA Collocated/Other	Primary	Other	N/A
Parameter code	88101	88502 (pm mass) – many others see SASS section	84313
Basic monitoring objective(s)	NAAQS comparison	Research	Research
Site type(s)	Population Exposure & Source Oriented	Population Exposure & Source Oriented	Population Exposure & Source Oriented
Monitor type(s)	SLAMS	SPM	SPM
Network affiliation(s)	N/A	N/A	N/A
Instrument manufacturer and model	Met One FEM BAM 1020	Met One SASS	Teledyne API AE-633
Method code	170	810	894
FRM/FEM/ARM/other	FEM	N/A	N/A
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	RTI	N/A
Reporting Agency	Air District	RTI	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitor start date	12/18/2012	02/12/2009	03/17/2009
Current Sampling frequency	Continuous	1:6	Continuous
Required Sampling frequency	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	5	5	5
Distance from supporting structure (meters)	>2	>2	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from trees (meters)	40	39	40
Distance to furnace or incinerator flue (meters)	None	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	No	No	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	N/A	N/A	Glass
Residence time for reactive gases (seconds)	N/A	N/A	N/A
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	Y	N	N/A
Frequency of flow rate verification for manual PM samplers	N/A	Monthly	N/A
Frequency of flow rate verification for automated PM analyzers	Bi-weekly	N/A	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	11/21/2014 06/02/2014	11/21/2014 06/02/2014	N/A

Palo Alto Airport

Site Name	Palo Alto Airport
AQS ID	06-085-2010
GPS coordinates	37.457621, 122.112286
Location	The end of the runway in the aircraft run-up zone
Address	1925 Embarcadero Road, Palo Alto, CA 94303
County	Santa Clara
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

Palo Alto airport was chosen by EPA as a lead monitoring site because piston engine aircraft utilizing this airport use leaded fuel. Additionally, very few air monitoring studies have been conducted to measure lead emissions near general aviation runways. To better assess lead emissions and possible public exposure to lead in the ambient air near general aviation airports, the EPA selected 15 airports from across the nation to participate in a one year airport lead monitoring study.

Lead monitoring at this site began on February 3, 2012 but was extended indefinitely because monitoring results showed that lead concentrations exceed 50% of the NAAQS in all but one of the rolling 3-month quarters since monitoring began. Lead monitoring ended on December 19, 2014 because Santa Clara County sold the property to the City of Palo Alto. The sale triggered an FAA review of various operational plans and permits, revealing that the lead sampler was not properly located according to FAA regulations. The closure date in AQS is December 23, 2014 (the date of the last audit).

As of June 2015, the Air District continues to work with the airport authorities to find a suitable new monitoring location at the airport, if one can be found. The site will be giving a new AQS identifier so that the results from two different locations are maintained separately in the database.

Palo Alto Airport Monitor Information

Pollutant, POC	**Lead (TSP), 3**
Primary/QA Collocated/Other	Primary
Parameter code	14129
Basic monitoring objective(s)	NAAQS Comparison & Research
Site type(s)	Source Oriented
Monitor type(s)	SLAMS
Network affiliation(s)	N/A
Instrument manufacturer and model	Tisch TE-HVPLUS-BL
Method code	191
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	RTI
Reporting Agency	Air District
Spatial scale	Micro
Monitor start date	02/03/2012
Current Sampling frequency	1:6
Required Sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	2.0
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	>20
Distance to furnace or incinerator flue (meters)	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	No
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	Yes – closed Dec 2014 Looking for new site on Airport
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	Quarterly
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	12/23/2014 06/09/2014

Patterson Pass

Site Name	Patterson Pass
AQS ID	06-001-2005
GPS coordinates	37.689615, 121.631916
Location	Trailer
Address	13224 Patterson Pass Road, Livermore, CA 94550
County	Alameda
Distance to road from gaseous probe (meters)	Patterson Pass Road: 400
Traffic count (AADT, year)	Patterson Pass Road: 3,595 (2012)
Groundcover	Vegetative
Statistical Area	San Francisco-Oakland-Fremont CBSA

The Patterson Pass site is part of a Bay Area Photochemical Assessment Monitoring Stations (PAMS) program. This is a program to measure hourly speciated hydrocarbons using a gas chromatograph analyzer at three Bay Area locations (the other two locations are San Ramon and Livermore). A full description of the PAMS program can be found in the PAMS section of this document.

The site is located in a sparsely populated unincorporated area in the hills east of Livermore. It was established in August 2010 to provide additional information about potential transport of ozone precursor compounds eastward from the Bay Area to the Central Valley. EPA is funding the VOC speciated hydrocarbon monitoring. In March 2011, the Air District added a NO/NO_2 monitor at this site. The Air District does not operate the NOx monitor during winter (December 1-March 31).

The Air District chooses to operate all monitors at this site as PAMS-like sites that meet both Appendix E and Appendix A as allowed under Part 58.11(d). In operation for more than 24 months, these monitors are eligible for NAAQS comparison, but will continue as SPMs and not contribute to minimum monitoring design requirements.

Since NO_2 monitoring began in March 2011, no exceedances of the national NO_2 standard have been measured.

Patterson Pass Monitor Information

Pollutant, POC	**NO, 1 / NO2, 1**
Primary/QA Collocated/Other	Primary
Parameter code	42601 / 42602
Basic monitoring objective(s)	Research
Site type(s)	Extreme downwind
Monitor type(s)	SPM
Network affiliation(s)	Unofficial PAMS
Instrument manufacturer and model	TECO 42i
Method code	074
FRM/FEM/ARM/other	FRM
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Regional
Monitor start date	03/01/2011
Current Sampling frequency	Continuous
Required Sampling frequency	N/A
Sampling season	04/01-11/30
Probe height (meters)	6
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	>50
Distance to furnace or incinerator flue (meters)	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	8
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	12/02/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

Point Richmond

Site Name	Point Richmond
AQS ID	06-013-0005
GPS coordinates	37.926162, 122.385561
Location	Air monitoring shelter next to fire station
Address	140 W. Richmond Ave, Richmond, CA 94801
County	Contra Costa
Distance to road From gaseous probe (meters)	Washington Ave: 25 W. Richmond Ave: 10 Park Place: 27 Interstate 580: 266
Traffic count (AADT, year)	Washington Ave: 1,000 (2012) W. Richmond Ave: 1,340 (2003) Park Place: 250 (2012) Interstate 580: 71,000 (2013)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Point Richmond was chosen for H_2S source oriented monitoring because the community is at the immediate southern periphery of the Chevron Refinery. The monitoring site is located in downtown Point Richmond, 0.2 miles south of the Chevron Refinery boundary. Point Richmond, a neighborhood within the City of Richmond, has a population of 3,780 according to the 2010 census.

Although prevailing winds in the area are from the south-southwest, occasional northerly winds will transport H_2S emissions from the refinery over the community. H_2S gases at Chevron can be emitted from the processing units, one mile to the north, or the Chevron Richmond Long Wharf Complex, one mile to the west, where crude oil and other feedstock chemicals from tankers are unloaded.

Point Richmond Monitor Information

Pollutant, POC	**H2S, 1**
Primary/QA Collocated/Other	N/A
Parameter code	42402
Basic monitoring objective(s)	Public Information
Site type(s)	Population Exposure & Source Oriented
Monitor type(s)	SPM
Network affiliation(s)	N/A
Instrument manufacturer and model	TECO 45C
Method code	020
FRM/FEM/ARM/other	N/A
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitor start date	01/01/1999
Current Sampling frequency	Continuous
Required Sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	3
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	N/A
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	N/A
Distance from trees (meters)	17
Distance to furnace or incinerator flue (meters)	7
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	5
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other week
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	10/23/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

Redwood City

Site Name	Redwood City
AQS ID	06-081-1001
GPS coordinates	37.482934, 122.203500
Location	One story commercial building
Address	897 Barron Ave, Redwood City, CA 94063
County	San Mateo
Distance to road from gaseous probe (meters)	Barron Ave: 13 Bay Road: 24 Warrington Ave: 131 US Highway 101: 455
Traffic count (AADT, year)	Barron Ave: 1,200 (2009) Warrington Ave: 1,140 (2008) Bay Road: 8,715 (2008) US Highway 101: 213,000 (2013)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Redwood City was chosen for air monitoring because it is one of the largest cities in San Mateo County, with a population of 76,815 according to the 2010 census. Being midway between San Francisco and San Jose, the site is well positioned to monitor ozone precursors and ozone moving southward across the peninsula as they are channeled by the coastal mountains to the west. Generally, Redwood City characterizes an area between South San Francisco and Palo Alto, which has a low air pollution potential due to the frequent presence of the sea breeze. Although the sea breeze typically keeps pollution levels low, when winds are light, high levels of ozone precursors, ozone, or particulates can occur due to the large number of sources in the area.

The air monitoring site is located in a commercial/industrial zone bordered by US Highway 101 on one side and residential areas on the other three sides. NO/NO_2 and ozone are collected because the area is a large source of ozone precursor emissions and ozone. Carbon monoxide is monitored because of the high traffic volume in the area with US Highway 101 0.3 miles north of the site. $PM_{2.5}$ is collected because light winds combined with surface-based inversions during the winter months can cause particulate levels to become elevated.

VOC toxic compounds are sampled at Redwood City on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

In the most recent three years, this site recorded no exceedances of the national 8-hour ozone standard and three exceedances of the national 24-hour $PM_{2.5}$ standard. No exceedances of the national standards for NO_2 or CO were measured during the last three years.

Redwood City Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**	**PM2.5, 3**
Primary/QA Collocated/Other	N/A	N/A	Primary	Primary
Parameter code	44201	42101	42601 / 42602	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population exposure	Population exposure	Population exposure	Population exposure
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	Met One FEM BAM 1020
Method code	047	054	074	170
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	07/01/1976	03/01/1967	03/01/1967	10/01/2009
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	7	7	7	6
Distance from supporting structure (meters)	>1	>1	>1	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	46	46	46	47
Distance to furnace or incinerator flue (meters)	13	13	13	14
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	17	17	17	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	08/05/2014	08/05/2014	08/05/2014	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A	08/04/2014 02/24/2014

Redwood City – Twin Dolphin

Site Name	Redwood City – Twin Dolphin
AQS ID	06-081-2003
GPS coordinates	37.518769, 122.249353
Location	One story building - Redwood City water pumping station
Address	1050 Twin Dolphin Drive, Redwood City, CA 94065
County	San Mateo
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

This Special Purpose Monitoring (SPM) site was established to measure potential population exposure to lead by piston engine aircraft at San Carlos Airport. The site was opened on March 17, 2013 because the nearby source-oriented, microscale lead monitor near the runway at San Carlos Airport recorded lead levels above the national 24-hour standard.

Measured lead concentrations at this site were well below the national standard and the site was closed on March 12, 2014.

Redwood City – Twin Dolphin Monitor Information

Pollutant, POC	**Lead (PM10), 3**
Primary/QA Collocated/Other	Primary
Parameter code	85129
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Population Exposure & Source Oriented
Monitor type(s)	SPM
Network affiliation(s)	N/A
Instrument manufacturer and model	Lo-Vol Partisol 2025
Method code	811
FRM/FEM/ARM/other	FRM
Collecting Agency	Air District
Analytical Lab	Air District
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitor start date	03/18/2013
Current Sampling frequency	1:6
Required Sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	6
Distance from supporting structure (meters)	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	7
Distance to furnace or incinerator flue (meters)	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	Yes – site closed
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	Monthly
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	02/24/2014 Site closed Apr 2014

Reid-Hillview Airport

Site Name	Reid-Hillview Airport
AQS ID	06-085-2011
GPS coordinates	37.329841, 121.815438
Location	The end of the runway in the aircraft run-up zone
Address	2500 Cunningham Ave., San Jose, CA 95148
County	Santa Clara
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

Reid-Hillview airport was chosen by EPA as a lead monitoring site because piston engine aircraft utilizing this airport use leaded fuel. Additionally, very few air monitoring studies have been conducted to measure lead emissions near general aviation runways. To better assess lead emissions and possible public exposure to lead in the ambient air near general aviation airports, the EPA selected 15 airports from across the nation to participate in a one year airport lead monitoring study. Lead monitoring at this site began on February 3, 2012.

For all airport lead monitoring sites in the EPA study, if the rolling three month average exceeds 50% of the 0.15 µg/m3 NAAQS, then the site will continue to operate indefinitely. For Reid-Hillview airport, results through December 2014 indicate that lead concentrations exceeded 50% of the NAAQS in a few of the rolling three month quarters. Consequently, this site will continue indefinitely.

Reid-Hillview Airport Monitor Information

Pollutant, POC	**Lead (TSP), 3**
Primary/QA Collocated/Other	Primary
Parameter code	14129
Basic monitoring objective(s)	NAAQS Comparison & Research
Site type(s)	Source Oriented
Monitor type(s)	SLAMS
Network affiliation(s)	N/A
Instrument manufacturer and model	Tisch TE-HVPLUS-BL
Method code	191
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	RTI
Reporting Agency	Air District
Spatial scale	Micro
Monitor start date	02/03/2012
Current Sampling frequency	1:6
Required Sampling frequency	N/A
Sampling season	01/01 - 12/31
Probe height (meters)	1.6[a]
Distance from supporting structure (meters)	N/A
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	> 20
Distance to furnace or incinerator flue (meters)	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	No
Unrestricted airflow (degrees)	360
Probe material for reactive gases	N/A
Residence time for reactive gases (seconds)	N/A
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	Quarterly
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	12/08/2014 06/09/2014

a The probe height of the lead sampler at Reid-Hillview is set to the height of the fence standing between the samplers and Tully Road in order to place the sampler within the area designated by EPA for sampling. This was a requirement of the Reid-Hillview Airport and was designed to ensure that the samplers were in unquestionable compliance with the FAA requirements in 14 CFR Part 77. Operation of the samplers at the airport was contingent on meeting this requirement. Movement of the sampler to achieve a probe height greater than or equal to 2 meters would result in the sampler being located off airport property.

Richmond 7th

Site Name	Richmond 7th
AQS ID	06-013-0006
GPS coordinates	37.948172, 122.364852
Location	Fire station
Address	1065 7th Street, Richmond, CA 94801
County	Contra Costa
Distance to road from gaseous probe (meters)	7th St: 22 Hensley St: 30 Richmond Parkway: 200
Traffic count (AADT, year)	7th St: 3,125 (2007) Hensley St: 3,700 (2012) Richmond Parkway: 32,000 (2012)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Richmond 7th Street was chosen for H_2S and SO_2 source oriented monitoring because it is near the eastern boundary of the Chevron Refinery. Richmond has a population of 103,701 according to the 2010 census and the site is located 0.5 miles east of the refinery boundary where public exposure to the highest H_2S and SO_2 concentrations are expected. Normally, monitoring is done downwind of the prevailing wind direction. However, the prevailing winds are from the south, and carry emissions over San Pablo Bay. Since it is impractical to monitor over San Pablo Bay, a monitoring site was chosen downwind of the secondary wind direction, on the east side of the refinery.

VOC toxic compounds are sampled at Richmond 7th on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

SO_2 concentrations measured at Richmond 7th did not exceed the national 1-hour 75 ppb standard during the last three years.

Richmond 7th Monitor Information

Pollutant, POC	**SO2, 1**	**H2S, 1**
Primary/QA Collocated/Other	N/A	N/A
Parameter code	42401	42402
Basic monitoring objective(s)	NAAQS comparison	Public information
Site type(s)	Population Exposure & Source Oriented	Population Exposure & Source Oriented
Monitor type(s)	SLAMS	SPM
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	TECO 43i	TECO 43C
Method code	060	020
FRM/FEM/ARM/other	FEM	N/A
Collecting Agency	Air District	Air District
Analytical Lab	N/A	N/A
Reporting Agency	Air District	Air District
Spatial scale	Neighborhood	Neighborhood
Monitor start date	07/01/1980	01/01/1999
Current Sampling frequency	Continuous	Continuous
Required Sampling frequency	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	8	8
Distance from supporting structure (meters)	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from trees (meters)	10	10
Distance to furnace or incinerator flue (meters)	12	12
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	Teflon	Teflon
Residence time for reactive gases (seconds)	5	6
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other week
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	11/03/2014	11/03/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A

Rodeo

Site Name	Rodeo
AQS ID	06-013-0007
GPS coordinates	38.034331, 122.270336
Location	Single story storage area at fire station
Address	326 Third Street, Rodeo, CA 94572
County	Contra Costa
Distance to road from gaseous probe (meters)	Third St: 13 Parker St: 249
Traffic count (AADT, year)	Third St: 500 (2007) Parker St: 9,484 (2013)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

Rodeo was chosen for H_2S source oriented monitoring because the Phillips 66 Refinery is on the northeastern boundary of the city with a population of 8,679 according to the 2010 census. Although the prevailing winds in the area are from the southwest, northeast winds can transport H_2S emissions from the refinery over the populated area of the town. The monitoring site is located in a residential area 0.6 miles southwest of the refinery.

Rodeo Monitor Information

Pollutant, POC	**H2S, 1**
Primary/QA Collocated/Other	N/A
Parameter code	42402
Basic monitoring objective(s)	Public information
Site type(s)	Population Exposure & Source Oriented
Monitor type(s)	SPM
Network affiliation(s)	N/A
Instrument manufacturer and model	TECO 45C
Method code	020
FRM/FEM/ARM/other	N/A
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Neighborhood
Monitor start date	04/01/2002
Current Sampling frequency	Continuous
Required Sampling frequency	N/A
Sampling season	01/01 – 12/31
Probe height (meters)	7
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None
Distance from trees (meters)	>50
Distance to furnace or incinerator flue (meters)	11
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	10
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other week
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	07/08/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

San Carlos Airport (I)

Site Name	San Carlos Airport (I) - Closed
AQS ID	06-081-2002
GPS coordinates	37.508813, 122.247291
Location	The end of the runway in the aircraft run-up zone
Address	620 Airport Drive, San Carlos, CA 94070
County	San Mateo
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

The lease agreement with the property owner where the monitoring equipment was located expired in August 2013. Consequently, the Air District shut down this site on September 13, 2013. A new San Carlos Airport monitoring site (San Carlos Airport II with AQS site ID of 06-081-2004) opened on March 25, 2015.

This site description will be removed from subsequent annual network plans because the new San Carlos Airport II began operating in March of 2015.

San Carlos Airport (I) Monitor Information

Pollutant, POC	**Lead (TSP), 3**	**Lead (TSP), 5**
Primary/QA Collocated/Other	Primary	QA Collocated
Parameter code	14129	14129
Basic monitoring objective(s)	NAAQS Comparison & Research	NAAQS Comparison & Research
Site type(s)	Source Oriented	Source Oriented
Monitor type(s)	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	Tisch TE-HVPLUS-BL	Tisch TE-HVPLUS-BL
Method code	191	191
FRM/FEM/ARM/other	FEM	FEM
Collecting Agency	Air District	Air District
Analytical Lab	RTI	RTI
Reporting Agency	Air District	Air District
Spatial scale	Micro	Micro
Monitor start date	03/10/2012	03/10/2012
Current Sampling frequency	1:6	1:12
Required Sampling frequency	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	1.6	1.6
Distance from supporting structure (meters)	N/A	N/A
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from trees (meters)	>20	>20
Distance to furnace or incinerator flue (meters)	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	3.1	3.1
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	No	No
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	Yes – shut down	Yes – shut down
Is it suitable for comparison against the annual PM2.5?	N/A	N/A
Frequency of flow rate verification for manual PM samplers	Quarterly	Quarterly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	06/06/2013 Site closed 9/13/13	06/06/2013 Site closed 9/13/13

San Carlos Airport (II)

Site Name	San Carlos Airport (II)
AQS ID	06-081-2004
GPS coordinates	37.508162, 122.246305
Location	The end of the runway in the aircraft run-up zone
Address	620 Airport Drive, San Carlos, CA 94070
County	San Mateo
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

San Carlos airport was chosen by EPA as a lead monitoring site because piston engine aircraft utilizing this airport use leaded fuel. Additionally, very few air monitoring studies have been conducted to measure lead emissions near general aviation runways. To better assess lead emissions and possible public exposure to lead in the ambient air near general aviation airports, the EPA selected 15 airports from across the nation to participate in a one year airport lead monitoring study. For all airport lead monitoring sites, if the rolling three month average exceeds 50% of the 0.15 µg/m3 NAAQS, then the site will continue to operate indefinitely. At San Carlos Airport, lead concentrations exceeded the 50% limit in almost every rolling three month quarter and, therefore, monitoring will continue at this airport indefinitely.

Lead monitoring at this site (both primary and collocated) started on March 25, 2015. This site has a different AQS site ID (06-081-2004) than the original San Carlos Airport I site because the new site is about 120 meters to the southeast and farther away from the aircraft run-up area. Significantly lower lead concentrations are expected at the new site because it is further away from the runway.

San Carlos Airport (II) Monitor Information

Pollutant, POC	**Lead (TSP), 3**	**Lead (TSP), 5**
Primary/QA Collocated/Other	Primary	QA Collocated
Parameter code	14129	14129
Basic monitoring objective(s)	NAAQS Comparison & Research	NAAQS Comparison & Research
Site type(s)	Source Oriented	Source Oriented
Monitor type(s)	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	Tisch TE-HVPLUS-BL	Tisch TE-HVPLUS-BL
Method code	191	191
FRM/FEM/ARM/other	FEM	FEM
Collecting Agency	Air District	Air District
Analytical Lab	RTI	RTI
Reporting Agency	Air District	Air District
Spatial scale	Micro	Micro
Monitor start date	03/25/2015	03/25/2015
Current Sampling frequency	1:6	1:12
Required Sampling frequency	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	TBA	TBA
Distance from supporting structure (meters)	N/A	N/A
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from trees (meters)	>20	>20
Distance to furnace or incinerator flue (meters)	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	2.8	2.8
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	No	No
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	No	No
Is it suitable for comparison against the annual PM2.5?	N/A	N/A
Frequency of flow rate verification for manual PM samplers	Quarterly	Quarterly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the **past calendar year** for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	None in 2014 – site just opened	None in 2014 – site just opened

San Francisco

Site Name	San Francisco
AQS ID	06-075-0005
GPS coordinates	37.765946, 122.399044
Location	One-story commercial building
Address	10 Arkansas St, Suite N, San Francisco, CA 94107
County	San Francisco
Distance to road from gaseous probe (meters)	16th St: 32 Interstate 280: 300 Arkansas St: 17 US Highway 101: 504
Traffic count (AADT, year)	16th St: 11,764 (2012) Arkansas St: 1,500 (est. 2014) Interstate 280: 114,000 (2013) U.S. Highway 101: 227,000 (2013)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

San Francisco was chosen for air monitoring because it is the second largest city in the Bay Area with a population of 805,235 according to the 2010 census. Although the sea breeze usually keeps pollution levels low, light wind conditions can result in high levels of ozone precursors or particulates due to the large number of sources in the city. The east side of the city was selected for air monitoring because it is densely populated (including a large number of daytime visitors and commuters), has some industry, and, as a transportation hub, has generally higher traffic volume. The site is located near the fringe of the central business district, in an area of light industry that is close to a residential area and two major freeways.

Ozone and NO/NO_2 are measured to monitor population exposure to these pollutants, and because this is a source area for ozone precursors. Carbon monoxide is measured due to high traffic volume. PM_{10} and $PM_{2.5}$ are measured due to stagnant days, surface-based inversions, and heavy vehicular traffic can cause elevated PM levels.

Because the Bay Area is well above the minimum monitoring requirements for PM_{10}, it was decided to convert PM_{10} monitoring from SLAMS to SPM, thus allowing a less frequent monitoring schedule (1:12 starting January 1, 2013) due to limited resources. Therefore, this monitor is no longer counted in PM_{10} minimum monitoring requirement.

VOC toxic compounds are sampled at San Francisco by both the Air District and CARB on a 1:12 schedule and analyzed by their respective laboratories. Carbonyls and metals are also sampled by CARB on the same 1:12 schedule. Details about the CARB toxics monitoring program can be found at http://www.arb.ca.gov/toxics/toxics.htm. Information about toxics monitoring by the Air District can be found in the Toxics Program section of this report.

During the most recent three years, this site recorded three exceedances of the national 24-hour $PM_{2.5}$ standard and one exceedance of the national 1-hour NO_2 standard. There were no exceedances of the national standards for ozone, PM_{10}, or CO recorded.

San Francisco Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**
Primary/QA Collocated/Other	N/A	N/A	Primary
Parameter code	44201	42101	42601 / 42602
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure
Monitor type(s)	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i
Method code	047	054	074
FRM/FEM/ARM/other	FEM	FRM	FRM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitor start date	01/01/1986	01/01/1986	NO: 12/01/1985 NO2: 01/01/1986
Current Sampling frequency	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	11	11	11
Distance from supporting structure (meters)	>1	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from trees (meters)	15	15	15
Distance to furnace or incinerator flue (meters)	5	5	5
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	11	11	11
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	12/02/2014	12/02/2014	12/02/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A

San Francisco Monitor Information

Pollutant, POC	**PM10, 1**	**PM2.5, 3**
Primary/QA Collocated/Other	Primary	Primary
Parameter code	81102	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure
Monitor type(s)	SPM	SLAMS
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	Andersen HiVol 1200	Met One FEM BAM 1020
Method code	063	170
FRM/FEM/ARM/other	FRM	FEM
Collecting Agency	Air District	Air District
Analytical Lab	Air District	N/A
Reporting Agency	Air District	Air District
Spatial scale	Neighborhood	Neighborhood
Monitor start date	11/16/1986	10/01/2009
Current Sampling frequency	1:12	Continuous
Required Sampling frequency	N/A – No EE Flags - SPM	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	8	8
Distance from supporting structure (meters)	>2	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from trees (meters)	18	16
Distance to furnace or incinerator flue (meters)	7	7
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	No	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	Y
Frequency of flow rate verification for manual PM samplers	Quarterly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	11/24/2014 05/27/2014	11/24/2014 05/27/2014

San Jose Jackson

Site Name	San Jose Jackson
AQS ID	06-085-0005
GPS coordinates	37.348497, 121.894898
Location	Top floor of two-story commercial building
Address	158 E. Jackson St, San Jose, CA 95112
County	Santa Clara
Distance to road from gaseous probe (meters)	Jackson St: 15 4th St: 35
Traffic count (AADT, year)	Jackson St: 5,992 (2007) 4th St: 6,164 (2007)
Groundcover	Paved
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

San Jose was chosen for air monitoring because it is the largest city in the Bay Area, with a population of 945,942 according to the 2010 census. The air monitoring site is located in the center of northern Santa Clara Valley, in a commercial and residential part of downtown San Jose. This area is encircled by major freeways with an international airport 1.5 miles to the northwest.

Ozone precursors emitted within the central San Francisco Bay Area are often carried into the San Jose area by the prevailing northwesterly winds. The northern half of the Santa Clara Valley is densely populated and the associated activities of the residents also add significant pollutant emissions into the air. The air quality in this location is representative of a large part of the valley due to the diurnal up valley and down valley air flow, which mixes the pollutants throughout the valley.

NO/NO_2 and ozone are monitored because of the large amount of ozone precursor emissions near the area as well as from upwind areas. Carbon monoxide is measured because of the significant traffic volume in the area. PM_{10} and $PM_{2.5}$ are monitored because light winds combined with surface-based inversions within the valley during winter months can cause elevated particulate levels.

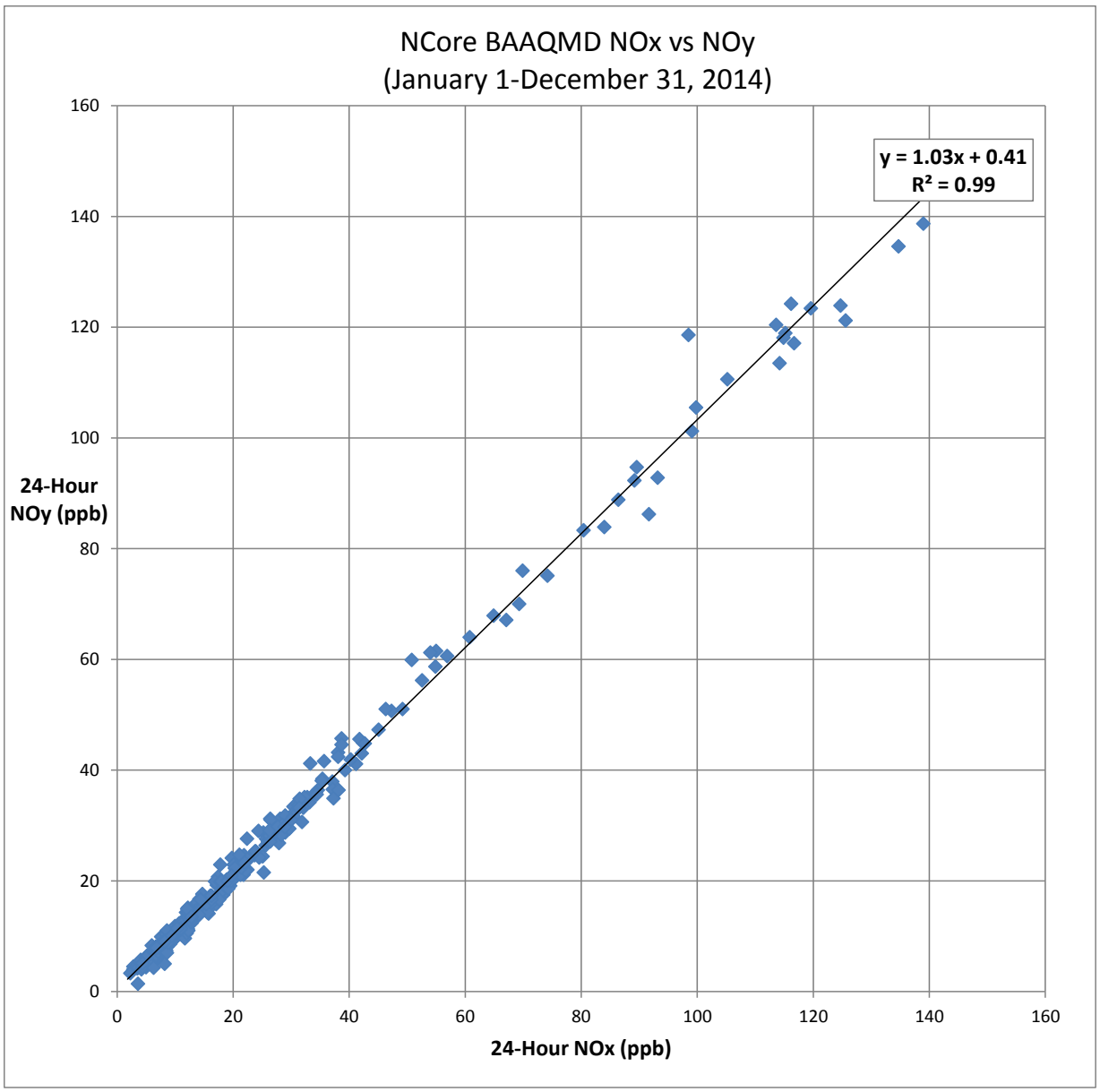
The San Jose station was approved by EPA as a National Core (NCore) multi-pollutant monitoring station on October 30, 2009 and NCore air monitoring began on January 1, 2011. In March 2014, the Air District requested a waiver (see Appendix F) to discontinue NO_y monitoring for the NCore program because 2011-2013 data showed an insignificant statistical difference between NO_x and NO_y. 2014 data shows identical finding as shown Figure 12.

Gaseous VOC toxic compounds, carbonyls, and metals are sampled on a 1:6 schedule as part of the NATTS program. Gaseous toxic compounds and carbonyls are analyzed by the Air District laboratory while metals are analyzed by an outside laboratory. CARB also does sampling for VOC toxic compounds, carbonyls, and metals at San Jose but on a 1:12 schedule with the analysis done by the CARB laboratory. More information about CARB toxics monitoring can be found at http://www.arb.ca.gov/toxics/toxics.htm. Information about toxics monitoring by the Air District can be found in the Toxics Program section of this report.

The NCore program requires reporting of PM coarse ($PM_{10-2.5}$) every 3rd day. PM coarse is determined by subtracting the concentration from the $PM_{2.5}$ sampler and the PM_{10} sampler. There is not an instrument that directly measures PM coarse. This site also operates a $PM_{2.5}$ continuous FEM-BAM for real time air quality forecasting and public health assessments. Lead is analyzed from the PM_{10} filters for NCore and NATTS programs on a 1:6 schedule.

In the most recent three years, this site recorded one exceedance of the national 8-hour ozone standard and ten exceedances of the national 24-hour $PM_{2.5}$ standard. No exceedances of the national standards for PM_{10}, NO_2, SO_2, or CO were measured during the last three years.

Figure 12. Scatter plot of NOx vs NOy at the NCore San Jose Jackson air monitoring site



San Jose Jackson Monitor Information

Pollutant, POC	**O3, 1**	**CO[a], 1**	**NO, 1 / NO2, 1**	**SO2[a], 1**
Primary/QA Collocated/Other	N/A	N/A	Primary	N/A
Parameter code	44201	42101	42601 / 42602	42401
Basic monitoring objective(s)	NAAQS comparison & Research	NAAQS comparison & Research	NAAQS comparison & Research	NAAQS comparison & Research
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	NCore	NCore	N/A	NCore
Instrument manufacturer and model	TECO 49i	TECO 48iTLE	TECO 42i	TECO 43iTLE
Method code	047	554	074	560
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Urban
Monitor start date	11/01/2002	11/01/2002	11/01/2002	02/10/2009
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	12	12	12	12
Distance from supporting structure (meters)	>1	>1	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	>50[b]	>50[b]	>50[b]	>50[b]
Distance to furnace or incinerator flue (meters)	5	5	5	5
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	14	15	14	15
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	12/09/2014	09/09/2014	12/09/2014	09/09/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A	N/A

a Trace level instruments required for CO and SO_2 at NCore sites.

b The closest tree was trimmed on 11/14/2014, making its height below the inlet probe. The closest tree above the inlet probe is now >50 meters away.

San Jose Jackson Monitor Information

Pollutant, POC	**NOy[a], 2**	**NO[a], 2 (from NOy)**	**PM10, 1**	**Lead (from PM10), 1**
Primary/QA Collocated/Other	N/A	N/A	Primary	Primary
Parameter code	42600	42601	81102	85129
Basic monitoring objective(s)	Research	Research	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population exposure	Population exposure (not source oriented)
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	NCore	NCore	N/A	NCore
Instrument manufacturer and model	API 200 EU/NOy	API 200 EU/NOy	Partisol 2025 without VSCC	Partisol 2025 without VSCC
Method code	699 (was 599)[b]	699 (was 599)[b]	127	907
FRM/FEM/ARM/other	N/A	N/A	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	Air District	ERG
Reporting Agency	Air District	Air District	Air District	ERG
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	01/13/2011	01/01/2011	10/15/2002	06/01/2012
Current Sampling frequency	Continuous	Continuous	1:3 (1:6 required)	1:6
Required Sampling frequency	N/A	N/A	1:6 – No EE Flags	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	11	11	9	9
Distance from supporting structure (meters)	>1	>1	>2	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	>50[c]	>50[c]	>50[c]	>50[c]
Distance to furnace or incinerator flue (meters)	5	5	3	3
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	No	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	N/A	N/A
Residence time for reactive gases (seconds)	None	None	N/A	N/A
Will there be changes within the next 18 months?	Y – wavier to shut down pending	Y – wavier to shut down pending	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Monthly	Monthly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A	N/A	NA
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	12/08/2014 06/26/2014	12/08/2014 06/26/2014

a Trace level instruments required for NO and NOy at NCore sites.

b The BAAQMD changed method code to 699 per EPA memo released on December 22, 2014, affecting oxides of nitrogen analyzers.

c The closest tree was trimmed on 11/14/2014, making its height below the inlet probe. The closest tree above the inlet probe is now >50 meters away.

San Jose Jackson Monitor Information

Pollutant, POC	**PM10-2.5 (PM coarse)**	**PM2.5, 1**[a]	**PM2.5, 3**	**Speciated PM2.5, 5**
Primary/QA Collocated/Other	Primary	QA Collocated	Primary	Other
Parameter code	86101	88101	88101	88502 (pm mass) – many others see SASS section
Basic monitoring objective(s)	Research	NAAQS comparison	NAAQS comparison	Research
Site type(s)	Population exposure	Quality Assurance	Population exposure & Highest Conc.	Population exposure
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	NCore	NCore	NCore	NCore CSN STN
Instrument manufacturer and model	Partisol 2025 without VSCC	Partisol-Plus 2025 w/VSCC	Met One FEM BAM 1020	Met One SASS
Method code	176	145	170	810
FRM/FEM/ARM/other	FRM	FRM	FEM	N/A
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	Air District	Air District	N/A	RTI
Reporting Agency	Air District	Air District	Air District	RTI
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	1/1/2011	10/05/2002	10/01/2012	10/05/2002
Current Sampling frequency	1:3 (NCore)	1:3 (NCore)	Continuous	1:3
Required Sampling frequency	1:3 (NCore)	1:3 (NCore)	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	9	9	10	9
Distance from supporting structure (meters)	>2	>2	>2	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	>50[b]	>50[b]	>50[b]	>50[b]
Distance to furnace or incinerator flue (meters)	2	2	4	4
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	4.0	4.0	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	No	No	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	No	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A	N/A	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	Y	Y	N
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	Monthly
Frequency of flow rate verification for automated PM analyzers	Monthly	Monthly	Bi-weekly	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	12/08/2014 06/26/2014	12/08/2014 06/26/2014	12/08/2014 06/26/2014	12/08/2014 06/26/2014

a $PM_{2.5}$ POC 1 was the primary sampler from October 2002 through September 2012 and was changed to be the collocated sampler after October 1, 2012 when $PM_{2.5}$ POC 3 became operational as the primary monitor.

b The closest tree was trimmed on 11/14/2014, making its height below the inlet probe. The closest tree above the inlet probe is now >50 meters away.

San Jose – Knox Avenue (Near-road)

Site Name	San Jose – Knox Avenue
AQS ID	06-085-0006
GPS coordinates	37.338135, 121.849783
Location	Trailer within 50m of freeway
Address	1007 Knox Ave. San Jose
County	Santa Clara
Distance to road from gaseous probe (meters)	32.8
Traffic count (AADT, year)	245,000 (2013)
Groundcover	Gravel
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

The Air District is monitoring pollutants at this site because it has the 4th highest Fleet Equivalent AADT (FE-AADT) in Santa Clara County. Road segments with higher FE-AADT values in Santa Clara County did not meet EPA siting requirements for monitoring (either the roadway was elevated or was otherwise in an unsafe location).

This site is monitoring NO/NO_2, CO, $PM_{2.5,}$ Ultrafine Particulate Matter (UFP), Black Carbon (BC) and toxics. Toxics sampling began on August 15, 2014. Monitoring for all other parameters began on September 1, 2014. The site is located with the city of San Jose which is the largest city in the Bay Area with a population of 945,942 according to the 2010 census.

$PM_{2.5}$ monitoring at this site is considered representative of area-wide concentrations within this major metropolitan region and are comparable to neighborhood scale $PM_{2.5}$ monitoring being conducted at the San Jose Jackson air monitoring site. Figure 4 on Page 18 shows a diagram comparing $PM_{2.5}$ measured at San Jose Knox Avenue and San Jose Jackson with a correlation of 0.93 between September 1, 2014 and February 28, 2015 which, in general, is the high $PM_{2.5}$ season for $PM_{2.5}$ in the Bay Area. The Air District will continue to evaluate this comparison in our Annual Network Plan next year.

The site type for NO/NO_2, CO, and $PM_{2.5}$ in AQS and in the accompanying tables has been updated since our last annual plan from source oriented to source oriented and population exposure based on the similarity in pollutant concentration with other nearby measurements. The site is within ¼ mile of residential and commercial areas in San Jose.

San Jose – Knox Avenue Monitor Information

Pollutant, POC	**NO, 1 / NO2, 1**	**CO, 1**	**PM2.5, 3**	**BC, 1**
Primary/QA Collocated/Other	Primary	N/A	Primary	N/A
Parameter code	42601 / 42602	42101	88101	84313
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	Public Information
Site type(s)	Source Oriented & Population Exposure	Source Oriented & Population Exposure	Source Oriented & Population Exposure	Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS	SPM
Network affiliation(s)	Near Road	Near Road	Near Road	N/A
Instrument manufacturer and model	TECO 42i	TECO 48i	Met One FEM BAM 1020	Teledyne API AE-633
Method code	074	054	170	894
FRM/FEM/ARM/other	FRM	FRM	FEM	N/A
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Micro	Micro	Micro	Micro
Monitor start date	09/01/2014	09/01/2014	09/01/2014	09/01/2014
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01-12/31
Probe height (meters)	6	6	5	6
Distance from supporting structure (meters)	>1	>1	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	8	8	8	8
Distance to furnace or incinerator flue (meters)	None	None	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	No	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	N/A	N/A
Residence time for reactive gases (seconds)	17	16	N/A	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	Y	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-weekly	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	10/21/2014	10/21/2014	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	10/21/2014 Site opened Sep 2014	N/A

San Martin

Site Name	San Martin
AQS ID	06-085-2006
GPS coordinates	37.079379, 121.600031
Location	Air monitoring shelter next to maintenance shed
Address	13030 Murphy Ave, San Martin, CA 95046
County	Santa Clara
Distance to road from gaseous probe (meters)	Murphy Ave: 57 US Highway 101: 455 Monterey Rd: 562 San Martin Ave: 920
Traffic count (AADT, year)	Murphy Ave: 400 (2011) US Highway 101: 109,000 (2013) Monterey Rd: 9350 (2011) San Martin Ave: 8360 (2011)
Groundcover	Vegetative
Statistical Area	San Jose-Sunnyvale-Santa Clara CBSA

San Martin was chosen for monitoring ozone because earlier field measurements showed this area to have the highest ozone concentrations in the Santa Clara Valley. Prevailing winds transport ozone and ozone precursors down the valley from the densely populated San Jose area as well as the surrounding San Francisco Bay. Because ozone is formed by a chemical reaction between organic and nitrogen oxide gases in the presence of sunlight, the highest ozone concentrations are usually observed tens of miles downwind from the highest concentration of emission sources (freeways, power generating facilities, etc.) because the reactions involving the organic gases are relatively slow.

San Martin is located in an agricultural area at the south end of the Santa Clara Valley approximately 24 miles southeast of downtown San Jose and is a Census Designated Place (CDP) with a population of 7,027 based on the 2010 census. The monitoring site is located at the South County Airport, in the center of the valley and about 0.3 miles west of US Highway 101.

In the most recent three years, this site recorded five exceedances of the national 8-hour ozone standard.

San Martin Monitor Information

Pollutant, POC	**O3, 1**
Primary/QA Collocated/Other	N/A
Parameter code	44201
Basic monitoring objective(s)	NAAQS comparison
Site type(s)	Max. Ozone Conc. & Population Exposure & Regional Transport
Monitor type(s)	SLAMS
Network affiliation(s)	N/A
Instrument manufacturer and model	TECO 49i
Method code	047
FRM/FEM/ARM/other	FEM
Collecting Agency	Air District
Analytical Lab	N/A
Reporting Agency	Air District
Spatial scale	Urban
Monitor start date	04/30/1994
Current Sampling frequency	Continuous
Required Sampling frequency	N/A
Sampling season	04/01-11/30
Probe height (meters)	5
Distance from supporting structure (meters)	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	N/A
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	N/A
Distance from trees (meters)	23
Distance to furnace or incinerator flue (meters)	N/A
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees)	360
Probe material for reactive gases	Teflon
Residence time for reactive gases (seconds)	17
Will there be changes within the next 18 months?	N
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check for gaseous instruments	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	11/13/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

San Pablo

Site Name	San Pablo
AQS ID	06-013-1004
GPS coordinates	37.960400, 122.356811
Location	One story commercial building
Address	1865-D Rumrill Blvd, San Pablo, CA 94806
County	Contra Costa
Distance to road from gaseous probe (meters)	Rumrill Blvd: 16
Traffic count (AADT, year)	Rumrill Blvd: 15,518 (2013)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

San Pablo, with a population of 29,139 according to the 2010 census, was chosen for air monitoring because the city is in the most populated portion of western Contra Costa County. San Pablo is almost completely surrounded by the city of Richmond with a population of 103,701. This area of the county has heavy industry, high traffic volume including two major freeways, and is close to the Chevron Refinery. Ozone and NO/NO_2 are measured because the area is downwind of the central San Francisco Bay Area, which is a large source of ozone precursor emissions. Carbon monoxide is measured due to the high traffic volume in the area. SO_2 is measured because the site is 1.2 miles downwind of the Chevron refinery, which can be a significant source of SO_2 emissions. $PM_{2.5}$ and PM_{10} are measured because stagnant days in the fall and winter can result in elevated particulate levels.

A $PM_{2.5}$ FEM BAM began operation on December 12, 2012. The FEM BAM is classified as middle scale based on its distance from the roadway and nearby traffic volume. The Air District considers this monitor to be comparable to the NAAQS because the monitor is representative of area-wide $PM_{2.5}$ concentrations.

The monitoring scale for ozone is middle scale. Following an EPA Region 9 review of the distance between the gaseous probe and the roadway, and the corresponding traffic count, EPA Region 9 suggested this monitor be changed from SLAMS to SPM and the Air District agreed to the change. Consequently, this monitor cannot be used toward meeting the minimum monitoring requirements for ozone.

VOC toxic compounds are sampled at San Pablo on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

Since $PM_{2.5}$ monitoring began in December 2012, this site recorded three exceedances of the national 24-hour $PM_{2.5}$ standard. No national exceedances of the national standards for Ozone, NO_2, SO_2, CO or PM_{10} were measured during the past three years.

San Pablo Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**	**SO2, 1**
Primary/QA Collocated/Other	N/A	N/A	Primary	N/A
Parameter code	44201	42101	42601 / 42602	42401
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure & Source Oriented
Monitor type(s)	SPM	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	TECO 43i
Method code	047	054	074	060
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Middle	Middle	Middle	Neighborhood
Monitor start date	09/13/2002	09/13/2002	09/13/2002	09/13/2002
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	9	9	9	9
Distance from supporting structure (meters)	>1	>1	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	>50	>50	>50	>50
Distance to furnace or incinerator flue (meters)	3	3	3	3
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	9	9	10	9
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	11/05/2014	11/05/2014	11/05/2014	11/05/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A	N/A

San Pablo Monitor Information

Pollutant, POC	**PM10, 1**	**PM2.5, 3**
Primary/QA Collocated/Other	Primary	Primary
Parameter code	81102	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure
Monitor type(s)	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	Tisch Env. HiVol TE-60	Met One FEM BAM 1020
Method code	141	170
FRM/FEM/ARM/other	FRM	FEM
Collecting Agency	Air District	Air District
Analytical Lab	Air District	Air District
Reporting Agency	Air District	Air District
Spatial scale	Middle	Middle
Monitor start date	09/23/2002	12/12/2012
Current Sampling frequency	1:6	Continuous
Required Sampling frequency	1:6 – No EE Flags	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	5	6
Distance from supporting structure (meters)	>2	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from trees (meters)	>50	>50
Distance to furnace or incinerator flue (meters)	7	7
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	No	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	Y
Frequency of flow rate verification for manual PM samplers	Quarterly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	11/05/2014 06/19/2014	11/05/2014 06/19/2014

San Rafael

Site Name	San Rafael
AQS ID	06-041-0001
GPS coordinates	37.972310, 122.520004
Location	Second floor of two-story commercial building
Address	534 4th Street, San Rafael, CA 94901
County	Marin
Distance to road from gaseous probe (meters)	4th St: 18 Irwin St: 48 US Highway 101: 112 3rd St: 124
Traffic count (AADT, year)	4th St: 10,967 (2011) Irwin St: 17,606 (2011) US Highway 101: 135,000 (2013) 3rd St: 24,692 (2011)
Groundcover	Paved
Statistical Area	San Francisco-Oakland-Fremont CBSA

San Rafael was chosen for air monitoring because it is the largest city in Marin County with a population of 57,713 according to the 2010 census. The city's climate and air quality is representative of that found throughout the populous eastern side of the county. Afternoon sea breezes typically keep pollution levels low. However, when the sea breeze is absent, local sources can cause elevated pollution levels.

The monitoring site is located in a commercial building about a block east of US Highway 101 and near major highway access ramps. It is one half mile east of the downtown San Rafael business district. There is no industrial activity in the immediate area. Ozone and NO/NO_2 are measured to monitor general population exposure to these pollutants. Carbon monoxide and PM_{10} are measured because the site is close to a major transportation corridor. $PM_{2.5}$ is measured because light winds combined with wood burning, vehicular traffic, and surfaced-based inversions during winter can cause elevated particulate concentrations.

VOC toxic compounds are sampled at San Rafael on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

The monitoring scale for ozone is middle scale. Following an EPA Region 9 review of the distance between the gaseous probe and the roadway, and the corresponding traffic count, EPA Region 9 suggested this monitor be changed from SLAMS to SPM and the Air District agreed to the change. Consequently, this monitor cannot be used toward meeting the minimum monitoring requirements for ozone.

The $PM_{2.5}$ FEM BAM that has operated since 2009 was reclassified as middle scale based on its distance from the roadway and nearby traffic volume. The Air District considers this monitor to be comparable to the NAAQS because the monitor is representative of area-wide $PM_{2.5}$ concentrations.

During the most recent three years this site recorded three exceedances of the national 24-hour $PM_{2.5}$ standard and no exceedances of the national standards for PM_{10}, NO_2 or CO.

San Rafael Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**
Primary/QA Collocated/Other	N/A	N/A	Primary
Parameter code	44201	42101	42601 / 42602
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure
Monitor type(s)	SPM	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i
Method code	047	054	074
FRM/FEM/ARM/other	FEM	FRM	FRM
Collecting Agency	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District
Spatial scale	Middle	Middle	Middle
Monitor start date	07/01/1976	10/01/1967	NO: 01/01/1968 NO2:10/01/1967
Current Sampling frequency	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	12	12	12
Distance from supporting structure (meters)	>1	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	H Dist = 23[a] V Dist above probe = 17	H Dist = 23[a] V Dist above probe = 17	H Dist = 23[a] V Dist above probe = 17
Distance from trees (meters)	14	14	14
Distance to furnace or incinerator flue (meters)	4	4	4
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A
Unrestricted airflow (degrees)	320	320	320
Probe material for reactive gases	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	11	12	13
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	09/04/2014	09/04/2014	09/04/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A

a The "obstruction not on the roof" is between zero degrees (north) and 40 degrees (northeast) leaving greater than 270 degrees of unobstructed airflow. The prevailing winds are from the south and lay within the unobstructed arc.

San Rafael Monitor Information

Pollutant, POC	**PM10, 1**	**PM2.5, 3**
Primary/QA Collocated/Other	Primary	Primary
Parameter code	81102	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure
Monitor type(s)	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	Andersen HiVol 1200	Met One FEM BAM 1020
Method code	063	170
FRM/FEM/ARM/other	FRM	FEM
Collecting Agency	Air District	Air District
Analytical Lab	Air District	N/A
Reporting Agency	Air District	Air District
Spatial scale	Middle	Middle
Monitor start date	11/04/1986	10/27/2009
Current Sampling frequency	1:6	Continuous
Required Sampling frequency	1:6 – No EE Flags	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	8	9
Distance from supporting structure (meters)	>2	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	H Dist = 22[a] V Dist above probe = 21	H Dist = 25 [a] V Dist above probe = 20
Distance from trees (meters)	13	10
Distance to furnace or incinerator flue (meters)	2	3
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	No	N/A
Unrestricted airflow (degrees)	320	320
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	Y
Frequency of flow rate verification for manual PM samplers	Quarterly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	09/03/2014 03/19/2014	09/03/2014 03/19/2014

a The "obstruction not on the roof" is between zero degrees (north) and 40 degrees (northeast) leaving greater than 270 degrees of unobstructed airflow. The prevailing winds are from the south and lay within the unobstructed arc.

San Ramon

Site Name	San Ramon
AQS ID	06-013-2007
GPS coordinates	37.743649, 121.934188
Location	Top of trailer
Address	9885 Alcosta Blvd, San Ramon, CA 94582
County	Contra Costa
Distance to road from gaseous probe (meters)	Alcosta Blvd: 300 Pine Valley Rd: 100 Estero Dr: 250 Del Mar Dr: 350
Traffic count (AADT, year)	Alcosta Blvd: 8,277 (2010) Pine Valley Rd: <500 (est. 2012) Estero Dr: <500 (est. 2012) Del Mar Dr: <500 (est. 2012)
Groundcover	Gravel
Statistical Area	San Francisco-Oakland-Fremont CBSA

San Ramon was chosen to be an upwind ozone and ozone precursor background site to better characterize ozone levels in the Livermore Valley where the highest ozone design values in the Bay Area occur. San Ramon is also a population oriented monitoring site and has a population of 72,148 according to the 2010 census. The site is located along the I-680 corridor which connects the Livermore Valley with San Ramon Valley and other major cities of Contra Costa County.

During summer, localized north winds can be channeled southward from Concord and Walnut Creek along the I-680 corridor and pass through San Ramon before turning eastward into the Livermore Valley. Consequently, ozone and NO/NO_2 are measured at Sam Ramon in support of the Bay Area Photochemical Assessment Monitoring Stations (PAMS) program. Additionally, hourly speciated hydrocarbons are also measured using a gas chromatograph analyzer for the PAMS program. A full description of the PAMS program can be found in the PAMS section of this document. In late 2013, the Air District decided to not operate the NOx monitor during winter.

The Air District chooses to operate all monitors at this site as PAMS-like sites that meet both Appendix E and Appendix A as allowed under Part 58.11(d). In operation for more than 24 months, these monitors are eligible for NAAQS comparison, but will continue as SPMs and not contribute to minimum monitoring design requirements.

During the last three years, six exceedances of the national 8-hour ozone standard have been recorded. During the same period, no exceedances of the national NO_2 standard have been measured.

San Ramon Monitor Information

Pollutant, POC	**O3, 1**	**NO, 1 / NO2, 1**
Primary/QA Collocated/Other	N/A	Primary
Parameter code	44201	42601 / 42602
Basic monitoring objective(s)	Research	Research
Site type(s)	Population Exposure & Upwind Background	Population Exposure & Max precursor impact
Monitor type(s)	SPM	SPM
Network affiliation(s)	Unofficial PAMS	Unofficial PAMS
Instrument manufacturer and model	TECO 49i	TECO 42i
Method code	047	074
FRM/FEM/ARM/other	FEM	FRM
Collecting Agency	Air District	Air District
Analytical Lab	N/A	N/A
Reporting Agency	Air District	Air District
Spatial scale	Urban	Urban
Monitor start date	01/01/2012	01/01/2012
Current Sampling frequency	Continuous	Continuous
Required Sampling frequency	N/A	N/A
Sampling season	04/01 – 11/30	01/01-11/30 in 2013 04/01-11/30 in 2014
Probe height (meters)	6	6
Distance from supporting structure (meters)	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None
Distance from trees (meters)	62	62
Distance to furnace or incinerator flue (meters)	None	None
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases	Teflon	Teflon
Residence time for reactive gases (seconds)	16	16
Will there be changes within the next 18 months?	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	12/04/2014	12/04/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A

Sebastopol

Site Name	Sebastopol
AQS ID	06-097-0004
GPS coordinates	38.403765, 122.818294
Location	Top of two-story commercial building
Address	103 Morris Street, Sebastopol, CA 95472
County	Sonoma
Distance to road from gaseous probe (meters)	Morris St.: 80 Highway 12: 70
Traffic count (AADT, year)	Morris St.: 3,300 (2011) Highway 12: 23,200 (2013)
Groundcover	Paved
Statistical Area	Santa Rosa-Petaluma CBSA

Sebastopol was chosen for air monitoring because the Air District was forced to move out of the Santa Rosa location when the landlord refused to extend the lease. Although the Air District's first choice would be to find a new site in Santa Rosa, time constraints required the new site be opened by mid-January and a very good monitoring site was found in Sebastopol, in the fall of 2013. The site became operational on January 9, 2014.

Sebastopol's population was 7,379 according to the 2010 census. The city's climate is strongly influenced by the Pacific Ocean and the marine air flow is expected to keep pollution levels low.

There are no industrial sources in the immediate area. Ozone and NO/NO_2 are measured to monitor general population exposure to these pollutants. Carbon monoxide is measured because of the local urban traffic volume and proximity to the State Routes 12 and 116 corridor which connects Sebastopol to surrounding rural portions of Sonoma County, a region known as West County, which has a population of up to 50,000 residents. $PM_{2.5}$ is measured because light winds combined with wood burning, vehicular traffic, and surface-based inversions in winter can cause elevated particulate concentrations.

VOC toxic compounds are sampled on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

Pollutant concentrations measured at Sebastopol have not recorded any exceedances of the national standards for ozone, $PM_{2.5}$, NO_2 or CO since opening in January 2014.

Sebastopol Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**	**PM2.5, 3**
Primary/QA Collocated/Other	N/A	N/A	Primary	Primary
Parameter code	44201	42101	42601 / 42602	88101
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure & Highest Conc.
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	Met One FEM BAM 1020
Method code	047	054	074	170
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitor start date	01/09/2014	01/09/2014	01/09/2014	01/09/2014
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31	01/01 – 12/31
Probe height (meters)	12	12	12	9
Distance from supporting structure (meters)	>1	>1	>1	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	12	12	12	12
Distance to furnace or incinerator flue (meters)	4	4	4	4
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	N/A
Residence time for reactive gases (seconds)	7	8	9	N/A
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	Y
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	Bi-weekly
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	08/27/2014	08/27/2014	08/27/2014	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A	08/27/2014 01/22/2014

Vallejo

Site Name	Vallejo
AQS ID	06-095-0004
GPS coordinates	38.102507, 122.237976
Location	One story commercial building
Address	304 Tuolumne St, Vallejo, CA 94590
County	Solano
Distance to road from probe (meters)	Tuolumne St: 18 Solano Ave: 33 Capitol St: 30 Interstate 80: 700
Traffic count (AADT, year)	Tuolumne St: 5,093 (2008) Capitol St: 500 (2008) Solano Ave: 8,588 (2008) Interstate 80: 138,000 (2013)
Groundcover	Paved
Statistical Area	Vallejo-Fairfield CBSA

Vallejo was chosen for air monitoring because it is the largest city in Solano County with a population of 115,942 according to the 2010 census. The monitoring site is located in a mixed commercial and residential neighborhood one mile east of downtown and 0.5 miles west of Interstate 80.

Ozone and NO/NO_2 are measured because southerly winds can transport ozone and its precursors into Vallejo from the heavily populated central Bay Area. Easterly winds can transport particulates from the Central Valley through the Carquinez Strait into Vallejo during winter. Additionally, $PM_{2.5}$ can be elevated in Vallejo in winter due to local fireplace burning during nighttime temperature inversions when winds are light. Additionally, over the last several years, data has shown this site to be impacted by transport of particulates from the Central Valley. Carbon monoxide is measured because Interstate 80 passes through the middle of the urban area east of the monitoring site. SO_2 is measured to monitor general population exposure and because refineries located to the south and east can be significant sources of SO_2.

A collocated $PM_{2.5}$ FEM BAM is operated at Vallejo because this site has one of the highest $PM_{2.5}$ design values in the Bay Area.

VOC toxic compounds are sampled at Vallejo on a 1:12 schedule and analyzed in the Air District laboratory. More information about the toxics monitoring program can be found in the Toxics Program section of this report.

During the most recent three years, this site recorded eight exceedances of the national 24-hour $PM_{2.5}$ standard. No exceedances of the national standards for Ozone, NO_2, SO_2, or CO were measured during the last three years.

Vallejo Monitor Information

Pollutant, POC	**O3, 1**	**CO, 1**	**NO, 1 / NO2, 1**	**SO2, 1**
Primary/QA Collocated/Other	N/A	N/A	Primary	N/A
Parameter code	44201	42101	42601 / 42602	42401
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	NAAQS comparison	NAAQS comparison
Site type(s)	Population Exposure	Population Exposure	Population Exposure	Population Exposure & Source Oriented
Monitor type(s)	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A	N/A	N/A
Instrument manufacturer and model	TECO 49i	TECO 48i	TECO 42i	TECO 43i
Method code	047	054	074	060
FRM/FEM/ARM/other	FEM	FRM	FRM	FEM
Collecting Agency	Air District	Air District	Air District	Air District
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	Air District	Air District	Air District	Air District
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Urban
Monitor start date	07/01/1976	07/01/1976	07/01/1976	07/01/1976
Current Sampling frequency	Continuous	Continuous	Continuous	Continuous
Required Sampling frequency	N/A	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	10	10	10	10
Distance from supporting structure (meters)	>1	>1	>1	>1
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None	None
Distance from trees (meters)	>50	>50	>50	>50
Distance to furnace or incinerator flue (meters)	4	4	4	4
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	N/A	N/A	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360	360
Probe material for reactive gases	Teflon	Teflon	Teflon	Teflon
Residence time for reactive gases (seconds)	8	10	11	10
Will there be changes within the next 18 months?	N	N	N	N
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check for gaseous instruments	Every other day	Every other day	Every other day	Every other day
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	11/18/2014	11/18/2014	11/18/2014	11/18/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A	N/A	N/A

Vallejo Monitor Information

Pollutant, POC	**PM2.5, 3**	**PM2.5, 4**	**PM2.5, 5 Speciated**
Primary/QA Collocated/Other	Primary	QA Collocated	Other
Parameter code	88101	88101	88502 (pm mass) – many others see SASS section
Basic monitoring objective(s)	NAAQS comparison	NAAQS comparison	Research
Site type(s)	Population exposure Highest Conc. & Regional Transport	Quality Assurance	Population exposure
Monitor type(s)	SLAMS	SLAMS	SPM
Network affiliation(s)	N/A	N/A	N/A
Instrument manufacturer and model	Met One FEM BAM 1020	Met One FEM BAM 1020	Met One SASS
Method code	170	170	810
FRM/FEM/ARM/other	FEM	FEM	N/A
Collecting Agency	Air District	Air District	Air District
Analytical Lab	Air District	Air District	DRI
Reporting Agency	Air District	Air District	DRI
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Monitor start date	01/01/2011	01/01/2013	06/11/2008
Current Sampling frequency	Continuous	Continuous	1:6
Required Sampling frequency	N/A	N/A	N/A
Sampling season	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Probe height (meters)	6	6	7
Distance from supporting structure (meters)	>2	>2	>2
Distance from obstructions on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from obstructions not on roof (meters). Include horizontal distance + vertical height above probe for obstructions nearby (meters).	None	None	None
Distance from trees (meters)	>50	>50	>50
Distance to furnace or incinerator flue (meters)	3	3	5
Distance between monitors fulfilling a QA collocation requirement (meters)	4	4	N/A
For low volume PM instruments (flow rate < 200 liters/minute) is any PM instrument within 1m of the LoVol? If yes, please list distance (meters) and instruments(s).	No	No	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the HiVol? If yes, please list distance (meters) and instrument(s).	N/A	N/A	N/A
Unrestricted airflow (degrees)	360	360	360
Probe material for reactive gases	N/A	N/A	N/A
Residence time for reactive gases (seconds)	N/A	N/A	N/A
Will there be changes within the next 18 months?	N	N	N
Is it suitable for comparison against the annual PM2.5?	Y	Y	N
Frequency of flow rate verification for manual PM samplers	N/A	N/A	Monthly
Frequency of flow rate verification for automated PM analyzers	Bi-weekly	Bi-weekly	N/A
Frequency of one-point QC check for gaseous instruments	N/A	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	11/17/2014 06/17/2014	11/17/2014 06/17/2014	11/17/2014 06/17/2014

Special Monitoring Programs Conducted in 2014

Meteorology Program

The Air District operates a meteorological monitoring program to provide measurements of ambient meteorological parameters to meet the requirements of many programs within the Air District. Air District programs using meteorological data are: air quality forecasting, photochemical modeling, source modeling, and data analysis. To obtain high quality data to be used for regulatory applications, the Air District considers EPA recommendations for siting, instrumentation, data accuracy, and quality assurance.

The placement of meteorological stations depends on the use of the data. Sites chosen for air quality forecasting are located in areas that show the general wind and temperature patterns within the Air District. Photochemical modeling sites are chosen to show boundary conditions, general conditions, and upper air meteorological conditions. Source modeling sites are chosen to be representative of the source and receptor domain to be modeled. Sites used for data analysis are usually located near high pollution areas to determine the trajectories between source areas and downwind high concentration areas, as well as the general atmospheric conditions occurring during the episodes.

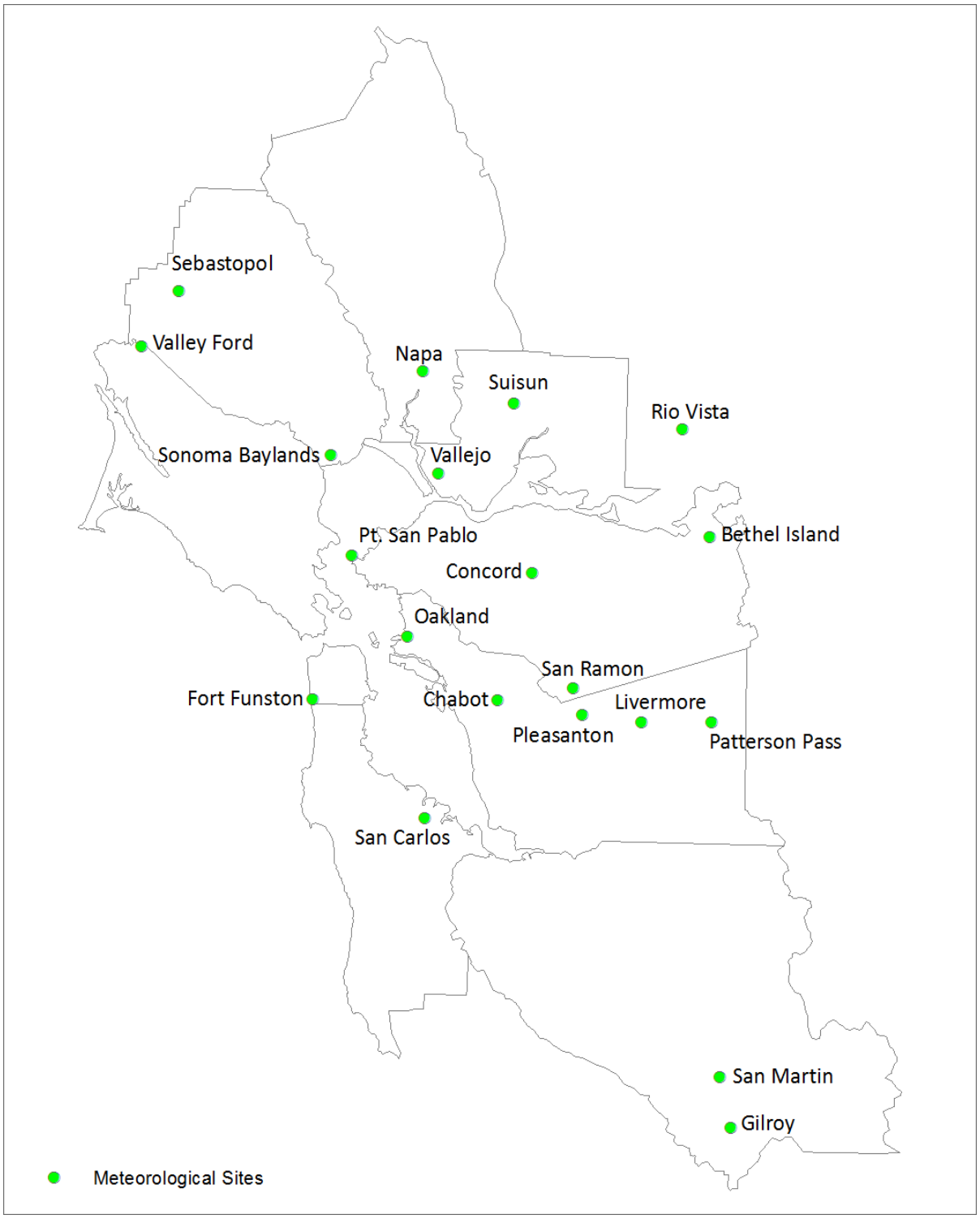
Because most Air District air monitoring stations are in urban or suburban neighborhoods where multistory buildings and trees are nearby, it is not possible to place meteorological systems at all Air District air monitoring stations and meet EPA meteorological siting recommendations. EPA recommends wind systems be located at a height of 10 meters or at plume height if the use is source oriented modeling. In addition, the distance between the wind instrument and any obstruction should be at least 10 times the height of the obstruction.

In 2014, the meteorological network consists of 19 sites. Figure 13 shows their locations. Nine are adjacent to air monitoring stations (Bethel Island, Suisun, Concord, Patterson Pass, San Ramon, Vallejo, Livermore, Gilroy, and San Martin). The other air monitoring stations have obstructions to air flow nearby, necessitating placement of the meteorological sites further away. Additionally, to meet forecasting or photochemical modeling needs, some meteorological sites have been placed on ridges or mountain tops, such as at Chabot and Patterson Pass. Sensors used in the Air District's meteorological network include wind speed and direction, temperature, relative humidity, precipitation, and pressure.

Hourly-averaged data are made available to District staff and the public on the Air District's web page, and are archived in the Technical Service Division's database. Each site is visited monthly by Air District staff for a visual inspection of the instrumentation. If problems are seen, a technician visits the site to correct problems. Data is also reviewed on an ongoing basis by Air District meteorologist providing daily air quality forecasts for the Bay Area.

Data recorded at airports, oil refineries, sewage treatment plants, universities, and private companies are included in the Technical Services Division meteorological database as long as they meet EPA recommended siting and maintenance specifications. If requested by facilities, Air District staff will advise where to place meteorological stations and how to maintain the sensors so the data can be used for regulatory purposes.

Figure 13. Map of Air District Meteorological Monitoring Sites in 2014



National Air Toxics Trends Station (NATTS) at San Jose

EPA established the National Air Toxics Trends Stations (NATTS) network in 2003. The program was created to improve national toxics monitoring with the goal of identifying toxics trends in urban and rural settings in the United States. EPA and the Air District agreed to include San Jose in the NATTS network because and because San Jose is the largest city in Northern California with a 2010 population of 945,942 and the San Jose air monitoring station has long data record (since 1991). The Air District began operating a NATTS site at the San Jose air monitoring station on January 1, 2003 with samples taken on a1:6 schedule.

Hazardous Air Pollutants (HAPs) Measurements

NATTS pollutants can be grouped into four categories: hazardous air pollutants, continuous measurements, polycyclic aromatic hydrocarbons, and metals. In 2014, the NATTS program required 19 compounds to be measured, as listed in Table 22. These compounds were selected for analysis based on toxicity, available measurement methods, measurement cost, correlation with other important HAPs, and expected concentration levels. Hexavalent chromium is the only required NATTS airborne toxic compound that the Air District does not directly measure, because the current sampling methodology allows significant deterioration of the compound before the analysis can be performed. Chromium is measured instead as an estimate of hexavalent chromium concentrations. In the future, the Air District may sample for hexavalent chromium when better sampling techniques are developed.

Table 22. List of the 19 NATTS HAPs Monitored by the Air District in 2014

Hazardous Air Pollutant or Species	Parameter	Method Code	Year NATTS Measurements Began	Parameter Type	Sample Source (24-hr Period)	Analyzing Lab	Analysis Equipment
1, 3 Butadiene	43218	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Benzene	45201	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Carbon tetrachloride	43804	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Chloroform	43803	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Tetrachloroethylene	43817	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Trichloroethylene	43824	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Vinyl Chloride	43860	210	2003	VOC	SUMMA canister	BAAQMD	GCMS
Acrolein	43505	210	2008	VOC	SUMMA canister	BAAQMD	GCMS
Formaldehyde	43502	202	2006	Carbonyl	Cartridge	BAAQMD	HPLC
Acetaldehyde	43503	202	2006	Carbonyl	Cartridge	BAAQMD	HPLC
Benzo(a)pyrene	17242	118	2008	PAH	Hi-Vol Polyurethane filter	ERG	GCMS
Naphthalene	17141	118	2008	PAH	Hi-Vol Polyurethane filter	ERG	GCMS
Arsenic	85103	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Beryllium	85105	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Cadmium	85110	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Chromium[1]	85112	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Lead	85129	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Manganese	85132	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS
Nickel	85136	907	2008	Metal	PM_{10} Lo-Vol Teflon filter	ERG	ICPMS

[1]Chromium is measured as an estimate of hexavalent chromium.

Emission sources of the NATTS HAPs:

- Benzene and 1, 3 butadiene are emitted by mobile sources (cars and trucks).
- Carbon tetrachloride, tetrachloroethylene and trichloroethylene are used for cleaning, but Air District regulations have significantly reduced their use.
- Chloroform is produced in the chlorination of water.
- Vinyl chloride is emitted by discharge of exhaust gases from factories that manufacture or process vinyl chloride, plastics and vinyl products as well as waste of mentioned products.
- Acrolein is generated by diesel and jet engines.
- Formaldehyde and acetaldehyde are formed during combustion processes. Formaldehyde is also created during the manufacture of some building materials and household products, and continues to off gas after manufacturing.
- Arsenic compounds originate from soil and the smelting of metals.
- Nickel and cadmium compounds are naturally found in some soils and can be emitted from fossil fuel combustion, cement manufacturing and electroplating. Also, cadmium comes from tire wear.
- Manganese compounds naturally occur in some soils and can be emitted from steel plants, power plants and coke ovens.
- Hexavalent chromium is emitted during chrome plating operations, and is believed to be a byproduct of the cement-making process.

Benzene; 1, 3 butadiene; acrolein; trichloroethylene; carbon tetrachloride; chloroform; trichloroethylene and vinyl chloride are collected in canisters using a Xontech 910a sampler. The canister contents are then analyzed in the Air District laboratory using a Gas Chromatograph Mass Spectrometer (GCMS) method TO-15.

Formaldehyde and acetaldehyde (carbonyls) are collected using a cartridge on one sampling channel of a Xontech 924 toxics sampler. In the Air District laboratory, exposed cartridges are analyzed for carbonyls using High Performance Liquid Chromatograph (HPLC) method TO-11.

Benzo(a)pyrene and Naphthalene (two PAH compounds) are collected using a HiVol Polyurethane Foam (PUF) filter and sent to ERG (EPA's designated contract laboratory) for analysis using GCMS method TO-13.

Metals are collected on a PM_{10} Low Volume Teflon filter and sent to ERG for analysis using Inductively Coupled Plasma Mass Spectrometry (ICPMS).

<u>Additional Polycyclic Aromatic Hydrocarbons (PAHs) Measurements</u>
The PAHs are products of incomplete combustion, and are found primarily in soil, sediment and oily substances, as opposed to in water or air. However, they are also a component of concern in particulate matter in air and have probable human carcinogenic (cancer), mutagenic (genetic mutation), and taratogenic (birth defects) properties.

In May 2008, the Air District began sampling for two PAHs for the NATTS program at San Jose (Benzo(a)pyrene and Naphthalene) as listed in Table 22. The PAH compounds are collected on a HiVol Polyurethane Foam (PUF) sampler on the NATTS 1:6 sampling schedule. ERG provides the filter media and does the analysis. Also, ERG provides the Air District with analysis results for 20 additional PAH compounds as listed in Table 23.

Table 23. Additional 20 PAH Compounds Measured by the Air District in 2014

Hazardous Air Pollutant or Species	Parameter	Method Code	Year Measurements Began	Sample Source (24-hr Period)	Analyzing Lab	Analysis Equipment
9-Fluorenone	17159	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Acenaphthene	17147	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Acenaphthylene	17148	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Anthracene	17151	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Benzo(a)anthracene	17215	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Benzo(b)fluoranthene	17220	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Benzo(e)pyrene	17224	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Benzo(g,h,i)perylene	17237	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Benzo(k)fluoranthene	17223	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Chrysene	17208	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Coronene	17211	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Cyclopenta(cd)pyrene	17160	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Dibenzo(a,h)anthracene	17231	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Fluoranthene	17201	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Fluorene	17149	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Indeno(1,2,3-cd)pyrene	17243	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Perylene	17212	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Phenanthrene	17150	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Pyrene	17204	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS
Retene	17158	118	2008	Hi-Vol Polyurethane filter	ERG	GCMS

Summary NATTS data are available from the EPA's AirData web site at http://www.epa.gov/airdata/ad_maps.html.

In addition to the NATTS analyses discussed in this section, the Air District also samples for other toxics compounds at San Jose. These are discussed in the Toxics Program section of this report.

NCore Program

In October 2006 the EPA revised 40 CFR Parts 53 and 58 to enhance ambient air quality monitoring to improve air quality measurements. One significant revision was the requirement to establish National Core (NCore) multi-pollutant monitoring stations. These stations will provide data on several pollutants at lower detection limits and replace the National Air Monitoring Station (NAMS) networks that have existed for several years. NCore stations will also be used to monitor trends of pollutants already in attainment. EPA recognized that pollutants already in attainment, and likely to remain so, did not need to be measured at all sites in a monitoring network. NCore stations are to be located in areas which represent the highest pollution levels for both attainment and non-attainment pollutants within an agency's boundaries. By reducing the number of monitors needed in a network, agencies can allocate scarce resources to other monitoring programs.

NCore stations are intended to:

- Report data to the public in a timely manner through AirNOW, air quality forecasting, and other public reporting mechanisms.
- Support development of emissions control strategies through air quality model evaluation and other observational methods.
- Track long-term trends for accountability of emissions control programs and health assessments that contribute to ongoing reviews and attainment of the National Ambient Air Quality Standards (NAAQS).
- Support scientific studies ranging across technological, health, and atmospheric disciplines including ecosystem assessments.

EPA designed the national NCore network to have a mixture of urban and rural sites. In Northern California, EPA desired a monitoring station that would represent a large urban area. Recommendations for locating NCore urban sites are found in 40 CFR Part 58 Appendix D and other EPA publications:

- Urban NCore stations are to be located at neighborhood or urban scale to provide representative exposure levels throughout the metropolitan area population.
- Urban NCore stations should be located where significant pollution levels exist.
- Population exposure monitoring is highly recommended.
- No biasing local pollutant emission sources should be within 500 meters at urban stations.
- Collocation with other network programs (such as NATTS, CSN, CASTNET, IMPROVE, NADP, PAMS) is encouraged.
- Siting of monitors at NCore sites must meet SLAMS requirements as specified in 40 CFR Part 58.

EPA and the Air District cooperatively agreed to establish the Northern California NCore station in San Jose effective January 1, 2011. EPA provides funding and the Air District operates the station. San Jose was chosen as the NCore site because it is the city with largest population in the Bay Area with nearly one million residents based on 2010 census data. Exceedances of both the ozone and 24-hour $PM_{2.5}$ national standards have been measured in San Jose. Consequently, operating an NCore station in the San Jose area would meet the requirement of being in an urban area with significant air pollution problems.

San Jose is located in the southern part of the Bay Area, and lies within the Santa Clara Valley. Wind patterns in the Santa Clara Valley are influenced greatly by the terrain, resulting in a prevailing flow roughly parallel to the valley's northwest-southeast orientation. During the daytime a sea breeze commonly carries pollutants from San Francisco, San Mateo and Alameda counties southward into the Santa Clara Valley, while a drainage flow carrying pollutants toward the bay, in the opposite direction, occurs during the nighttime hours. This diurnal up valley and down valley air flow mixes pollutants throughout the valley, making San Jose representative of a large part of the Bay Area.

The monitoring objective for the current San Jose air quality monitoring station is population exposure. Monitoring at a population-oriented station is intended to represent air quality levels over a large area having a high population density. Consequently, the site cannot be too close to large emission sources such as industrial sources or highways, and the surrounding land use should be relatively uniform. EPA has defined neighborhood or urban scale as the appropriate area of representativeness for population exposure monitoring. Neighborhood scale has dimensions of 4 km around the monitoring station, and urban scale has a 50 km radius. Figure 14 shows the location of the current San Jose monitoring station (as a blue balloon), and a 4 km circle around the site representing a neighborhood scale area.

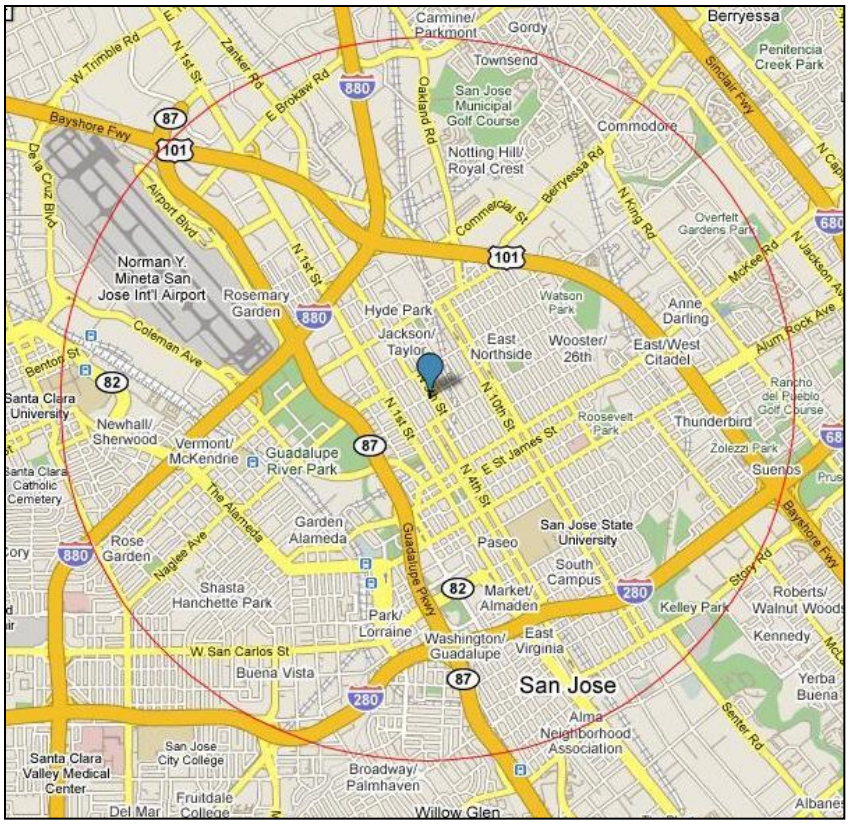


Figure 14. Map showing area of Neighborhood Scale at the San Jose NCore station

The map shows that the current station is located in a residential/commercial area of San Jose. The station is located on Jackson Street, 1.6 km NW of the downtown core. The Air District has operated air monitoring stations at various locations near downtown San Jose since 1968, and current station has been in operation since 2002. The downtown area is encircled by freeways, but the closest freeway to the air monitoring station is 800 meters to the WSW, which is sufficiently distant to prevent vehicular emissions from dominating the general air quality at the San Jose station. The San Jose Airport is 2 to 4 km from the air monitoring station, distant enough that impacts from airport emissions would be relatively low at the monitoring station. There are no large point sources within 500 meters of the station. The only significant emission sources within a 4 km radius of the San Jose air monitoring station are:

- The Norman Y. Mineta San José International Airport, located from 2-4 km NW of the site, is a significant source. The airport averaged 236 commercial and 132 general aviation departures and landings per day in 2013.
- Reed & Graham, Inc. (an asphalt batch plant) - located 3.7 km SSW of the site.
- Central Concrete Supply Company, Inc. - located 1.9 km SSW of the site.
- San Jose State University Cogeneration Plant - located 2.6 km SSE of the site.

The San Jose air monitoring station was located to provide air quality data representative of neighborhood scale monitoring. The station currently monitors all criteria pollutants, toxics, and is part of the EPA NATTS and STN programs.

NCore Monitors

Table 24 lists the NCore monitors operating at the San Jose station as well as the sampling methodology, sampling frequency and spatial scale for the monitors. Because ambient concentrations of the criteria pollutants CO and SO_2 are well below the NAAQS at population exposure sites across the U.S., EPA requires NCore sites to use higher sensitivity instruments than conventional instruments for these pollutants (note the use of TLE type instruments for CO and sulfur dioxide, meaning Trace Level-Enhanced). $PM_{10-2.5}$ is measured using the difference between measurements of a pair of Partisol-Plus Model 2025 Sequential samplers, with one configured as a $PM_{2.5}$ sampler and the other configured as a PM_{10} sampler. Lead is collected using the PM_{10} Teflon filter, which is sent to ERG (EPA's designated contract laboratory) for analysis using Inductively Coupled Plasma Mass Spectrometry (ICPMS).

In March 2014, the Air District requested a waiver to discontinue NO_y monitoring because the past three years of data showed an insignificant statistical difference between NOx and NOy. The waiver request is in Appendix F.

Table 24. NCore Monitors

Monitor Type	Sampling Method	Sampling Frequency	Spatial Scale
Carbon Monoxide (CO)	TECO 48i TLE	Continuously	Neighborhood
Ozone (O_3)	TECO 49i	Continuously	Neighborhood
Sulfur Dioxide (SO_2)	TECO 43i TLE	Continuously	Neighborhood
FRM $PM_{2.5}$	Partisol-Plus 2025 w/VSCC	1:3	Neighborhood
BAM $PM_{2.5}$	Met One FEM BAM 1020	Continuously	Neighborhood
$PM_{2.5}$ Speciation	Met One SASS	1:3	Neighborhood
Total Reactive Nitrogen (NO_y)	API 200EU/NOy	Continuously	Neighborhood
Nitric Oxide (NO) from NO_y	API 200EU/NOy	Continuously	Neighborhood
$PM_{10-2.5}$	Partisol-Plus 2025 Sequential $PM_{10-2.5}$ Air Sampler Pair	1:3	Neighborhood
Lead	PM_{10} Teflon filter analyzed by ERG using ICPMS	1:6	Neighborhood
Meteorological	EPA approved a waiver to use meteorological data from the San Jose Airport as official data for the NCore site.	Continuously	N.A.

Photochemical Assessment Monitoring Stations (PAMS)

The 1990 Clean Air Act Amendments required EPA to promulgate rules for the enhanced monitoring of ozone and its precursors (NO/NO_2 and VOCs) because of continued nonattainment of the National Ambient Air Quality Standard (NAAQS) for ozone nationwide. Subsequent revisions to EPA's Air Monitoring regulations, 40 CFR Part 58, required air pollution agencies to establish Photochemical Assessment Monitoring Stations (PAMS) in ozone nonattainment areas classified as serious, severe, or extreme. The Bay Area is not in any of these categories, but is in marginal nonattainment of the ozone NAAQS. Consequently, the Air District applied for and received funding from EPA to conduct measurements of VOC speciated hydrocarbons. Monitoring began in 2010 (at Livermore and Patterson Pass) and in 2012 (at San Ramon) and will continue indefinitely.

The objectives of the Bay Area PAMS program are to:

- Measure air quality improvement progress
- Track emission trends
- Improve photochemical model performance
- Adjust ozone control strategies

Traditionally, summertime Bay Area ozone concentrations are highest in the Livermore and Santa Clara Valleys. Meteorological conditions are ideal for ozone formation in these areas when precursor NO/NO_2 and hydrocarbons are present in upwind areas. To better understand the atmospheric chemistry, emissions sources, emission reductions strategies, and pollutant transport, three locations in the Livermore area monitor for speciated hydrocarbons. Each PAMS site has meteorological wind and temperature sensors.

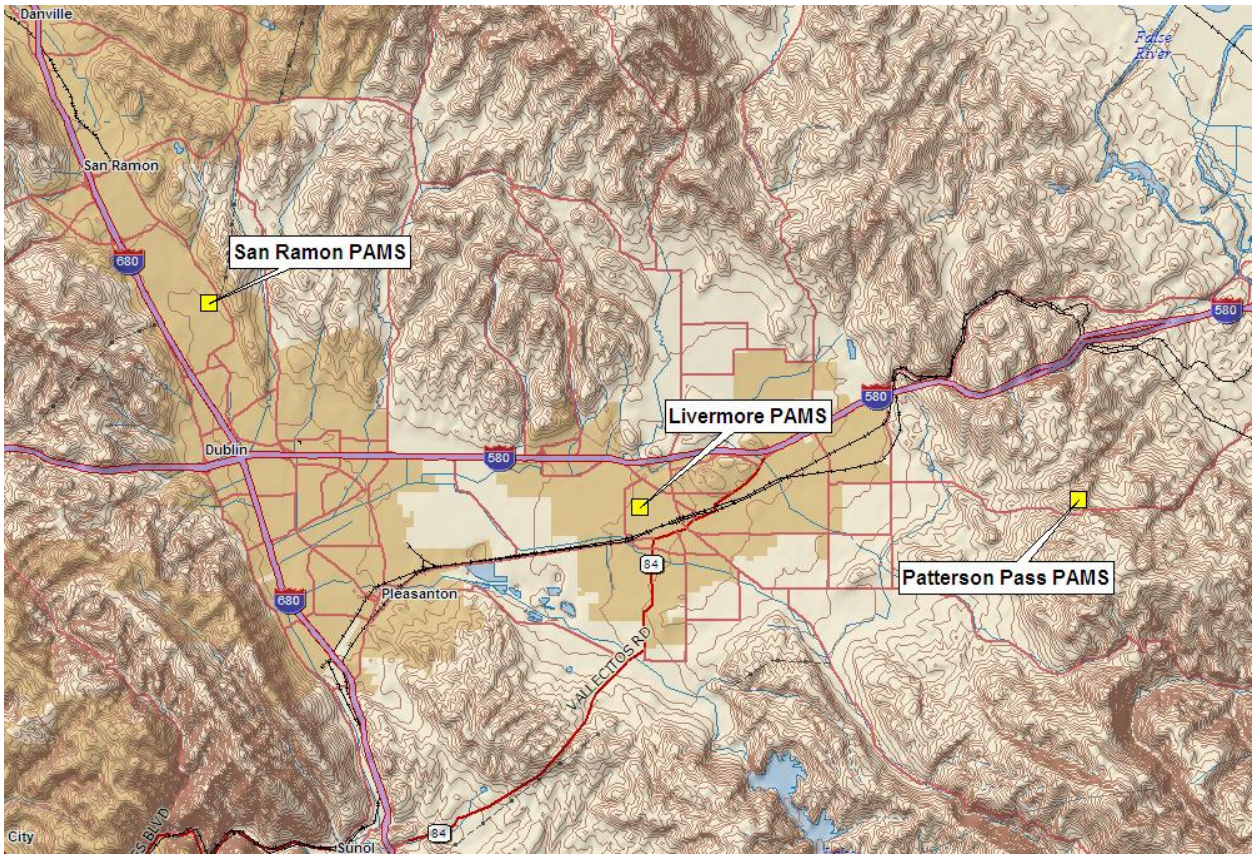
Site	Parameter	Start Date for PAMS Data Collection
Livermore	Air Monitoring	August 1, 2010
	Meteorology	August 1, 2010
San Ramon	Air Monitoring	January 1, 2012 (NO/NO_2)
		May 1, 2012 (hydrocarbons)
	Meteorology	December 14, 2011
Patterson Pass	Air Monitoring	March 1, 2011 (NO/NO_2)
		August 1, 2010 (hydrocarbons)
	Meteorology	October 27, 2011

The Air District's long existing Livermore air monitoring station was selected as a PAMS site because Livermore usually has the highest annual number of days exceeding the ozone NAAQS in the Bay Area. The site already had meteorological sensors measuring wind, temperature, and solar radiation; and air monitoring instruments measuring NO/NO_2 and ozone. As a result, the cost to add speciated hydrocarbon monitoring at Livermore was minimal.

The San Ramon and Patterson Pass sites are temporary sites operated solely for the PAMS program. The San Ramon PAMS provides information on ozone precursors and ozone formation in the San Ramon Valley that may contribute to ozone concentrations in the Livermore Valley. While the EPA provided funding for speciated hydrocarbon monitoring at San Ramon, the Air District added ozone and NO/NO_2 so data from this site can be compared to data collected at

Livermore. This site may become a permanent location for ozone and NO/NO_2 monitoring if these pollutants frequently exceed the NAAQS. The Patterson Pass site is located in the hills east of Livermore and provides additional information on the potential transport of ozone precursor compounds eastward from the Bay Area to the Central Valley. EPA funded speciated hydrocarbon monitoring and the Air District added a NOx monitor at this site. The three PAMS locations are shown in Figure 15.

Figure 15. Map of the three PAMS sites in the Livermore Valley



Prior to November 2013, EPA identified 57 organic ozone precursor compounds usually measured at PAMS locations because of their significance in photochemical ozone pollution. On November 20, 2013, EPA released a memo (http://www.epa.gov/ttn/amtic/files/ambient/pams/targetlist.pdf) revising the photochemical assessment monitoring station compound target list. The revisions divide the previous list into two categories – priority compounds and optional compounds. In addition, seven new compounds were added to the priority list, for a total of 34 priority compounds and 29 optional compounds.

The Air District measures 56 compounds every hour using a gas chromatograph (GC) instrument. The GC does not analyze for two compounds EPA considers important ozone precursors: formaldehyde and acetone. The Air District determined that it is too costly to measure these compounds hourly. In addition, the GC does not measure the new priority compounds identified in the November 2013 EPA memo, α/β-Pinene, 1,3 Butadiene, benzaldehyde, carbon tetrachloride, ethanol, and tetrachloroethylene. However, the GC does measure two additional

compounds not on the EPA target list, 1-hexene and n-dodecane. Table 25 below lists the 56 compounds measured by the GC.

Table 25. List of speciated hydrocarbons measured by Gas Chromatograph in 2014

Compound	Parameter Code	Method Code
n-dodecane	43141	142
Ethane	43202	142
Ethylene	43203	142
Propane	43204	142
Propylene	43205	142
Acetylene	43206	142
n-butane	43212	142
Isobutane	43214	142
t-2-butene / trans-2-butene	43216	142
c-2-butene / cis-2-butene	43217	142
n-pentane	43220	142
Isopentane	43221	142
1-pentene	43224	142
t-2-pentene / trans-2-pentene	43226	142
c-2-pentene / cis-2-pentene	43227	142
3-methylpentane	43230	142
n-hexane	43231	142
n-heptane	43232	142
n-octane	43233	142
n-nonane	43235	142
n-decane	43238	142
Cyclopentane	43242	142
Isoprene	43243	142
2-2-dimethylbutane	43244	142
2-4-dimethylpentane	43247	142
1-hexene	43245	142
Cyclohexane	43248	142
3-methylhexane	43249	142
2-2-4-trimethylpentane	43250	142
2-3-4-trimethylpentane	43252	142
3-methylheptane	43253	142
Methylcyclohexane	43261	142
Methylcyclopentane	43262	142
2-methylhexane	43263	142
1-butene	43280	142

Compound	Parameter Code	Method Code
2-3-dimethylbutane	43284	142
2-methylpentane	43285	142
2-3-dimethylpentane	43291	142
n-undecane	43954	142
2-methylheptane	43960	142
m/p xylene	45109	142
Benzene	45201	142
Toluene	45202	142
Ethylbenzene	45203	142
o-xylene	45204	142
1-3-5-trimethylbenzene	45207	142
1-2-4-trimethylbenzene	45208	142
n-propylbenzene	45209	142
Isopropylbenzene	45210	142
o-ethyltoluene	45211	142
m-ethyltoluene	45212	142
p-ethyltoluene	45213	142
m-diethylbenzene	45218	142
p-diethylbenzene	45219	142
Styrene	45220	142
1-2-3-trimethylbenzene	45225	142

The GCs, ozone and NO/NO_2 at San Ramon, and NO/NO_2 at Patterson Pass operated from April to November in 2014 and are intended to continue operating April through November in 2015. All ozone, NO/NO_2, and speciated hydrocarbon data are submitted to EPA's AQS database. When enough data is collected to yield a better understanding of emissions and photochemical processes in the Livermore area, the Air District will evaluate whether the instrumentation should be moved to the Santa Clara Valley for a similar PAMS program.

$PM_{2.5}$ Chemical Speciation Network (CSN)

In 1997, the EPA established national 24-hour and annual standards for fine particles less than or equal to 2.5 microns in diameter, known as $PM_{2.5}$ and required each state and local agency to begin ambient monitoring using Federal Reference Method (FRM) samplers. EPA also established a network of chemical speciation monitors to provide information for the development of control strategies in implementation plans and then to track the success of the plans. This monitoring program is known as the Chemical Speciation Network (CSN).

Speciation monitors provide chemical composition of $PM_{2.5}$ which aides in identification of emissions sources. Some CSN sites were designated as long-term trend sites predominately located in large urban areas. Such sites are part of the Speciation Trends Network (STN) to study longer term trends in the chemical composition of $PM_{2.5.}$ Other sites in the CSN program are known as CSN supplemental sites.

CSN STN monitoring has the primary objective of defining concentration trends of the elements, ions, and organic and elemental carbon components of $PM_{2.5}$. In January 1999, a $PM_{2.5}$ FRM sampler was installed in San Jose and the first year of data showed exceedances of the national standard. Consequently, EPA requested that a Met One Spiral Ambient Speciation Sampler (SASS) sampler be installed at the San Jose monitoring site which was located on Fourth Street at the time as part of the CSN STN program because the site is located in a major urban area. The site was relocated to Jackson Street in 2002. The sampler operates 24 hours from midnight to midnight, and samples are on a 1:3 schedule.

In April 2005, the Clean Air Scientific Advisory Committee supported changes to the EPA $PM_{2.5}$ speciation network to improve comparability with the rural Interagency Monitoring of Protected Visual Environments (IMPROVE) $PM_{2.5}$ carbon concentration data. The EPA process, designed to achieve this comparability, included replacing the carbon sampling method with the IMPROVE carbon Thermal Optical Reflectance (TOR) analysis method instead of the Thermal Optical Transmittance (TOT) method. Additionally, the EPA also requested the manufacturer of the IMPROVE sampler, URG Corporation, to modify the sampler to incorporate mass flow control versus fixed-orifice flow control. This effort resulted in a new instrument called the URG-3000N Sequential Particulate Speciation System. In the Bay Area, the Air District began operating the URG 3000 to collect $PM_{2.5}$ carbon concentrations at San Jose starting on April 1, 2009 while continuing to operate the SASS sampler to collect all the other compounds.

The SASS samplers draw air through size-selective nozzles that exclude particles greater than 2.5 microns. SASS samplers uses Teflon, nylon and quartz filters upon which to collect the samples, which are later weighed using a mass balance and analyzed using energy-dispersive X-ray fluorescence, ion chromatography, and thermal/optical analysis techniques to measure the components. The San Jose filter analysis is done by RTI, an EPA contract laboratory in North Carolina. Sixty-five chemical species listed in Table 26 are measured from each SASS filter sample at RTI, and can be viewed on the EPA's AirData web site at http://www.epa.gov/airdata/ad_maps.html.

BAAQMD Supplemental Chemical Speciation Network Program

The Air District added SASS samplers to existing air monitoring sites at Vallejo and Livermore in 2008 and at the Oakland West station in 2009. These samplers are NOT part of the national CSN program but are solely an Air District program. Vallejo and Livermore were selected for sampling because there was an interest in determining the source of $PM_{2.5}$ on days that exceed the standard at those sites. These sites may have a different $PM_{2.5}$ composition from that of San Jose because exceedances often occur on days when the air flow is from the Central Valley. Oakland West was selected because it is downwind of the Port of Oakland, a major source of diesel particulate matter. The Air District operates these samplers on a1:6 schedule. Additionally, DRI provides the filters, does the analysis, and submits the data to AQS; and the filters are also analyzed for palladium, thallium and uranium. Starting with data collected in January 2015, the Air District's laboratory staff will be preparing the filters and doing the analysis. The data will be quality assured and submitted to AQS by the Air District.

Table 26. $PM_{2.5}$ Speciation Measurements at Air District Sites in 2014

Compound	Parameter Code at San Jose	Parameter Code at Other Sites	Method Code at San Jose	Method Code at Other Sites
Metals				
Antimony	88102	88102	811	811
Arsenic	88103	88103	811	811
Aluminum	88104	88104	811	811
Barium	88107	88107	811	811
Bromine	88109	88109	811	811
Cadmium	88110	88110	811	811
Calcium	88111	88111	811	811
Chromium	88112	88112	811	811
Cobalt	88113	88113	811	811
Copper	88114	88114	811	811
Chlorine	88115	88115	811	811
Cerium	88117	88117	811	811
Cesium	88118	88118	811	811
Europium	88121	88121	811	811
Gallium	88124	88124	811	811
Gold	88143	88143	811	811
Hafnium	88127	88127	811	811
Iron	88126	88126	811	811
Indium	88131	88131	811	811
Iridium	88133	88133	811	811
Lanthanum	88146	88146	811	811
Lead	88128	88128	811	811
Manganese	88132	88132	811	811
Molybdenum	88134	88134	811	811
Magnesium	88140	88140	811	811
Mercury	88142	88142	811	811
Nickel	88136	88136	811	811
Niobium	88147	88147	811	811
Palladium[1]	-	88151	-	811
Phosphorous	88152	88152	811	811
Potassium	88180	88180	811	811

Compound	Parameter Code at San Jose	Parameter Code at Other Sites	Method Code at San Jose	Method Code at Other Sites
Rubidium	88176	88176	811	811
Samarium	88162	88162	811	811
Scandium	88163	88163	811	811
Selenium	88154	88154	811	811
Silicon	88165	88165	811	811
Silver	88166	88166	811	811
Sodium	88184	88184	811	811
Strontium	88168	88168	811	811
Sulfur	88169	88169	811	811
Tantalum	88170	88170	811	811
Terbium	88172	88172	811	811
Thallium[1]	-	88173	-	811
Tin	88160	88160	811	811
Titanium	88161	88161	811	811
Tungsten	88186	88186	811	811
Uranium[1]	-	88179	-	811
Vanadium	88164	88164	811	811
Yttrium	88183	88183	811	811
Zinc	88167	88167	811	811
Zirconium	88185	88185	811	811
Anions and Cations				
Ammonium Cation	88301	88301	812	812
Sodium Cation	88302	88302	812	812
Chloride Anion	88203	88203	812	812
Sulfate Anion	88403	88403	812	812
Potassium Cation	88303	88303	812	812
Nitrate Anion	88306	88306	812	812
Organic and Elemental Carbon				
Total Organic Carbon (sum of the OC Fractions below)	88370	88320	838	815
Elemental Carbon Fraction 1 (carbon released at 550ºC in 10% oxygen/90% helium gas)	88383	88329	841	814
Elemental Carbon Fraction 2 (carbon released at 700ºC in 10% oxygen/90% helium gas)	88384	88330	841	814
Elemental Carbon Fraction 3 (carbon released at 800ºC in 10% oxygen/90% helium gas)	88384	88331	841	814
Organic Carbon Fraction 1 (carbon released at 120ºC in helium gas)	88374	88324	841	814
Organic Carbon Fraction 2 (carbon released at 250ºC in helium gas)	88375	88325	841	814
Organic Carbon Fraction 3 (carbon released at 450ºC in helium gas)	88376	88326	841	814
Organic Carbon Fraction 4 (carbon released at 550ºC in helium gas)	88377	88327	841	814

[1] Elements measured only at Vallejo, Livermore, and Oakland West.

Toxics Program

The Clean Air Act Amendments of 1990 required EPA to set emission standards for major sources of Hazardous Air Pollutants (HAPs). The Act also required EPA to assess the risks to human health from HAPs. As of 2012 EPA had listed 187 compounds as HAPs and are known to cause or are suspected of causing cancer, birth defects, reproduction problems, and other serious illnesses. Exposure time to certain levels of some HAPs can cause difficulty in breathing, nausea or other illnesses and can even cause death.

Toxic pollutants (HAPs) are emitted daily by industrial and chemical manufacturing processes, commercial activities, refinery operations, gasoline marketing and motor vehicles within the Bay Area. Ambient concentrations vary by proximity to sources and current meteorological conditions.

The Air District established an ambient air toxics monitoring program with the objectives of:

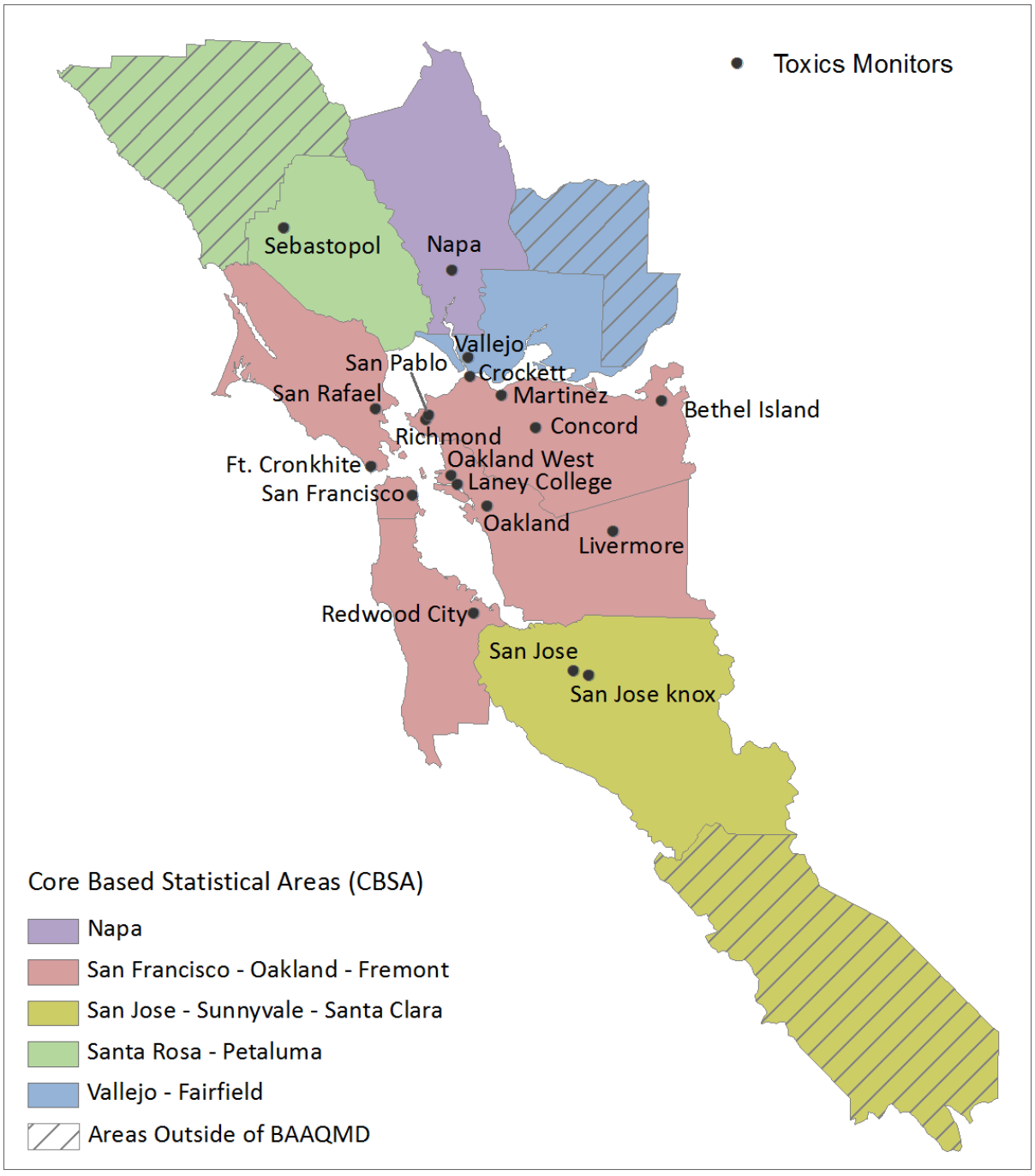
- Establishing trends and evaluating the effectiveness of HAP reduction strategies.
- Characterizing ambient concentrations in local areas.
- Providing data to support and evaluate dispersion and deposition models.
- Providing data to the scientific community to support studies to reduce uncertainty about the relationships between ambient levels of HAPs, actual human exposure to air toxics, and health effects from such exposures.

Figure 16 is a map of the 19 toxics monitoring sites operating in 2014. They are located at existing Air District monitoring stations to measure a wide range of contaminant levels throughout the Bay Area. The sites are generally located in major population centers or downwind of major industrial sources such as refineries. There is also an ambient background site at Fort Cronkhite. The toxics data collected at San Jose are reported to EPA as part of the NATTS program.

Air samples are collected at Air District toxics monitoring sites for a 24 hour period on a 1:12 schedule except at San Jose where sampling is on a 1:6 schedule as part of the NATTS program. A 1:12 schedule allows samples to be taken on a different day of the week over the course of months. This is the same schedule EPA and CARB use for their toxics monitoring programs, thereby allowing Bay Area toxics concentrations to be compared to concentrations measured elsewhere across the country.

Gaseous (VOC) toxics are collected in 6-liter SUMMA stainless steel canisters using Xontech 910 samplers. The sampler continuously collects an ambient air sample for 24-hours to ensure capturing transient and intermittent toxic releases. Since 2012, samples have been analyzed using gas chromatography mass spectrometry.

Figure 16. Map of Air District Toxics Monitoring Sites in 2014



Both the Air District and CARB have toxic monitoring programs in the Bay Area. CARB conducts toxic monitoring on a 1:12 schedule at two sites: San Francisco and San Jose. CARB supplies the canisters and performs the laboratory analyses, while Air District staff operates the CARB sampler and ships the canisters to CARB. Because the Air District also does toxics monitoring at San Francisco and San Jose, the two sets of data allow calculation of the measurement precision at these sites, and by extrapolation, an estimate of the precision of the toxics measurement program.

For Quality Assurance purposes, once a quarter at San Francisco, an additional canister sample is taken on a scheduled sample day using a collocated sampler. Both samples are analyzed by the Air District laboratory, and the results allow an additional measure of precision. Additionally, at least one canister per month is chosen at random for a second analysis. The results are sent to AQS for both the San Francisco collocated sample and the randomly selected replicate analysis.

From each canister sample, the Air District laboratory analyzes for the 23 gaseous toxic compounds shown in Table 27 from canister samples collected using a gas chromatography mass spectrometry instrument. The compounds selected for analysis were those that had high toxicity or were known to have high emissions in the Bay Area, or a combination of the two. Another consideration was whether the current methodology could accurately detect a compound at reasonable expense, based on previous CARB studies. Some compounds, such as carbon tetrachloride, are measured because their concentration in the ambient air does not change much over time. This is useful because carbon tetrachloride or other similar, stable compounds can be used for quality control purposes. If the measurement of such a control is unusually high or low, there may be a problem in the sampling, transport, storage, or analysis procedures.

Table 27. List of Toxic Compounds Measured by the Air District in 2014

Compound	Parameter Code	Method Code
1,3-Butadiene	43218	210
Acetone	43551	210
Acetonitrile	43702	210
Acrolein	43505	210
Acrylonitrile	43704	210
Benzene	45201	210
Carbon tetrachloride	43804	210
Chloroform	43803	210
Dichloromethane	43802	210
Ethyl alcohol	43302	210
Ethylbenzene	45203	210
Ethylene dibromide	43843	210
Ethylene dichloride	43815	210
Freon 113	43207	210
m/p Xylene	45109	210
Methyl chloroform	43814	210
Methyl ethyl ketone	43552	210

Compound	Parameter Code	Method Code
o-Xylene	45204	210
Tetrachloroethylene	43817	210
Toluene	45202	210
Trichloroethylene	43824	210
Trichlorofluoromethane	43811	210
Vinyl chloride	43860	210

Additional Toxics Monitoring at San Jose

In addition to the compounds listed in Table 27, formaldehyde and acetaldehyde are measured at San Jose on a 1:6 schedule as part of the NATTS program. These compounds are highly reactive and cannot be accurately measured using a canister sample. Instead, they are collected on a chemically treated cartridge using a Xontech 924 sampler, operated on the same 1:6 schedule. Samples are analyzed at the Air District laboratory using High Performance Liquid Chromatography.

Metals are also measured at San Jose as part of the NATTS program. A full description of the NATTS program can be found in the NATTS section of this document.

Summary toxics data are available from the EPA's AirData web site at http://www.epa.gov/airdata/.

Appendixes A through I

Appendix A. Ozone monitoring waiver correspondences

Air District request for ozone monitoring waiver December 1, 2013 through March 31, 2014. The request for the a waiver December 1, 2014 through March 31, 2015 was contained within the 2013 Annual Network Plan.

Novemer 4, 2013

Meredith Kurpius, Ph.D.
Manager, Air Quality Analysis Office
United States Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Dr. Kurpius:

As has been the practice since 1996, the Bay Area Air Quality Management District (BAAQMD) is requesting that a waiver from ambient ozone air monitoring be granted in accordance with 40 CFR Part 58.12 (a.3) from December 1, 2013 through March 31, 2014. We request that the following five SLAMS ozone stations be considered under this waiver:

1.	Hayward	AQS# 060012001
2.	Gilroy	AQS # 060850002
3.	San Martin	AQS # 060852006
4.	Fairfield	AQS # 060950005
5.	Los Gatos	AQS # 060851001

The Air District is also providing a courtesy notification of our intent to stop winter operation of one ozone SPM as well;

6.	San Ramon	AQS # 060132007

The San Ramon ozone monitor began operation on Jan 1, 2012 as a SPM as part of the District's unofficial PAMS network, and is not a required monitor for the San Francisco-Oakland-Fremont MSA. Historical data indicates the probability of these sites reaching any national or state standard during the winter months is extremely low. Fifteen ambient ozone analyzers at other BAAQMD air monitoring stations will continue operating during the waiver period.

Please contact Glen Colwell at (415) 749-4672 if you have any questions or concerns.

Sincerely,

Eric D. Stevenson
Director of Technical Services

cc: G. Yoshimura
F. Clover

939 ELLIS STREET • SAN FRANCISCO CALIFORNIA 94109 • 415.771.6000 • *www.baaqmd.gov*

Approval for ozone monitoring waiver December 1, 2013 through March 31, 2014

E. EPA approval of the waiver request for an ozone season deviation at five sites

Bay Area Air Quality Management District (BAAQMD) has requested a waiver to suspend operation of ozone analyzers from December 1, 2013 to March 31, 2013, at the following five sites: Fairfield, Hayward, Los Gatos, San Martin, and Gilroy (see the *2012 Air Monitoring Network Plan*, submitted July 2013, page 17). Per 40 CFR 58, Appendix D, Section 4.1(i), monitoring agencies must have deviations from regulatory sampling reasons approved by EPA, documented in the annual monitoring network plan, and updated in EPA's Air Quality System (AQS) database. Note that the ozone SPM at San Ramon will also suspend operations from December 1, 2013 to March 31, 2013.

The continuing record of data from the San Francisco Bay Area shows a low probability that these sites would measure an exceedance of the national ozone standards during these winter months. As shown in the attached AQS report, the past ten years of data show no exceedances of the National Ambient Air Quality Standard (NAAQS) for ozone at any monitors in the District during the months of November through March. In addition, BAAQMD will continue to operate ozone monitors at nine SLAMS and four SPM sites in the District throughout the waiver period. Therefore EPA approves the request for the waiver for the sites listed above.

Approval for ozone monitoring waiver December 1, 2014 through March 31, 2015

D. EPA approval of the waiver request for an ozone season deviation

Bay Area Air Quality Management District (BAAQMD) has requested a waiver to suspend operation of ozone analyzers from December 1, 2014 to March 31, 2015, at the following five sites: Fairfield, Hayward, Los Gatos, San Martin, and Gilroy (see the *2013 Air Monitoring Network Plan*, submitted June 2014, page 16). Per 40 CFR 58, Appendix D, Section 4.1(i), monitoring agencies must have deviations from regulatory sampling reasons approved by EPA, documented in the annual monitoring network plan, and updated in EPA's Air Quality System (AQS) database. Note that the ozone SPM at San Ramon will also suspend operations from December 1, 2014 to March 31, 2015.

The continuing record of data from the San Francisco Bay Area shows a low probability that these sites would measure an exceedance of the national ozone standards during these winter months. As shown in the attached AQS report showing certified data from 2010-2013 and preliminary data in 2014, there were no exceedances of the National Ambient Air Quality Standard (NAAQS) for ozone at any monitors in the District during the months of October through March in the previous five ozone seasons. In addition, BAAQMD will continue to operate ozone monitors at nine SLAMS and four SPM sites in the District throughout the waiver period. Therefore, EPA approves the request for the waiver for the sites listed above.

In future network plan requests for ozone season waivers, please include an analysis of the most recent data from your network, demonstrating that the shortened season is still appropriate. There are early May exceedances in 2013, and an exceedance in April in 2014, although no exceedances past September during those five years, so an updated evaluation of whether the April through November sampling season should be adjusted for a shift in the high ozone season seems warranted.

Appendix B. Ozone monitoring agreement between BAAQMD and MBUAPCD

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

June 4, 2014

Mr. Michael J. Gilroy
Deputy Air Pollution Control Officer
Monterey Bay Unified Air Pollution Control District
24580 Silver Cloud Court
Monterey, CA 93940

Dear Mr. Gilroy:

The Bay Area Air Quality Management District has signed the Ozone monitoring agreement as described in your letter of May 23, 2014 (attached). We will continue to operate the Ozone monitors at San Jose, Los Gatos, Gilroy, and San Martin as stated in your letter. We will advise you well in advance if any of these monitors are shutdown or moved to another location.

Sincerely,

Eric D. Stevenson
Director, Technical Services Division

Enclosure

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MBUAPCD
Monterey Bay Unified Air Pollution Control District
Serving Monterey, San Benito, and Santa Cruz Counties

24580 Silver Cloud Court
Monterey, CA 93940
PHONE: (831) 647-9411 • FAX: (831) 647-8501

May 23, 2014

Mr. Eric D. Stevenson
Director, Technical Services Division
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Subject: Shared Ozone Monitoring Responsibilities

Dear Mr. Stevenson:

For Ozone monitoring in the San Jose-Sunnyvale-Santa Clara Metropolitan Statistical Area (MSA), both of our agencies are required to meet the full minimum monitoring requirements of 40 CFR Part 58 Appendix D, section (2)(e) in the absence of an Ozone monitoring agreement. The Monterey Bay Unified Air Pollution Control District (MBUAPCD) currently operates one SLAMS Ozone monitor in this MSA (at Hollister) but two monitors are required. Therefore, MBUAPCD would like this letter to serve as a monitoring agreement between our two agencies.

The MBUAPCD requests BAAQMD reply to this letter confirming agreement to continue operation of the SLAMS Ozone monitors at San Jose, Los Gatos, Gilroy, and San Martin. Both agencies will advise each other if changes to the instruments listed below are planned.

	AQS#	Parameter	Method	POC
San Jose	060850005	44201	047	1
Los Gatos	060851001	44201	047	1
Gilroy	060850002	44201	047	1
San Martin	060852006	44201	047	1
Hollister	060690002	44201	047	1

Sincerely,

Michael J Gilroy
Deputy Air Pollution Control Officer
Monterey Bay Unified Air Pollution Control District
24580 Silver Cloud Court
Monterey, CA 93940
(831) 647-9411

Appendix C. PM_{10} monitoring agreement between BAAQMD and MBUAPCD

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

January 14, 2013

Mr. William Chevalier
Supervising Air Monitoring Specialist
Monterey Bay Unified Air Pollution Control District
24580 Silver Cloud Court
Monterey, CA 93940

Dear Mr. Chevalier:

During a recent review of the Annual Network Report for the Bay Area Air Quality Management District (BAAQMD), EPA Region 9 pointed out that we do not have a written agreement to share minimum monitoring requirements with neighboring Air Districts. For PM_{10} monitoring in the San Jose-Sunnyvale-Santa Clara Metropolitan Statistical Area (MSA), both of our agencies are required to meet the full minimum monitoring requirements of 40 CFR Part 58 Appendix D, section (2)(e) in the absence of a PM_{10} monitoring agreement.

The San Jose-Sunnyvale-Santa Clara MSA must have two SLAMS PM_{10} monitors to meet EPA minimum monitoring requirements. The BAAQMD operates one SLAMS PM_{10} monitor at San Jose and will continue to operate this instrument indefinitely.

The BAAQMD requests Monterey Bay Unified Air Pollution Control District reply to this letter confirming agreement to continue operating the SLAMS PM_{10} monitor at Hollister. As part of the agreement, both agencies will advise each other if changes to the instruments (as shown below) are planned.

	AQS#	Parameter	Method	POC
San Jose	060850005	81102	127	1
Hollister	060690002	81102	122	3

Sincerely,

Eric D. Stevenson
Director, Technical Services Division

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Appendix D. NO_2 monitoring agreement between BAAQMD and MBUAPCD

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

June 4, 2014

Mr. Michael J. Gilroy
Deputy Air Pollution Control Officer
Monterey Bay Unified Air Pollution Control District
24580 Silver Cloud Court
Monterey, CA 93940

Dear Mr. Gilroy:

The Bay Area Air Quality Management District has signed the NO_2 monitoring agreement as described in your letter of May 23, 2014 (attached). We will continue to operate the NO_2 monitor at San Jose as stated in your letter. We will advise you well in advance if this monitor is shutdown or moved to another location.

Sincerely,

Eric D. Stevenson
Director, Technical Services Division

Enclosure

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Monterey, CA 93940
PHONE: (831) 647-9411 • FAX: (831) 647-8501

May 23, 2014

Mr. Eric D. Stevenson
Director, Technical Services Division
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Subject: Shared NO/NO2/NOX Monitoring Responsibilities

Dear Mr. Stevenson:

40 CFR Part 58 Appendix D, section (2)(e), requires air monitoring of oxides of nitrogen to be performed to meet minimum federal requirement for the San Jose-Sunnyvale-Santa Clara Metropolitan Statistical Area (MSA). The Monterey Bay Unified Air Pollution Control District (MBUAPCD) currently does not operate any SLAMS NO_2 monitors in this MSA and would like this letter to serve as a monitoring agreement between our two agencies.

The MBUAPCD requests the Bay Area Air Quality Management District reply to this letter confirming agreement to continue operation of the SLAMS NO_2 monitor at San Jose and advise MBUAPCD if changes to this instrument are planned.

	AQS#	Parameter	Method	POC
San Jose	060850005	42602	074	1

Sincerely,

Michael J Gilroy
Deputy Air Pollution Control Officer
Monterey Bay Unified Air Pollution Control District
24580 Silver Cloud Court
Monterey, CA 93940
(831) 647-9411

Appendix E. CO, NO_2, and $PM_{2.5}$ near-road monitoring agreement between BAAQMD and MBUAPCD

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

May 14, 2015

Mr. Michael J. Gilroy
Deputy Air Pollution Control Officer
Monterey Bay Unified Air Pollution Control District
24580 Silver Cloud Court
Monterey, CA 93940

Dear Mr. Gilroy:

The Bay Area Air Quality Management District has signed the shared near-road CO, NO_2 and $PM_{2.5}$ monitoring agreement as described in your letter of May 13, 2015 (attached). We will continue to operate these monitors at the San Jose Knox monitoring site (060850006) as stated in your letter. We will advise you in advance if any of these monitors are shutdown or moved to another location.

Sincerely,

Eric D. Stevenson
Director, Meteorology, Measurement and Rules Division

Enclosure

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Monterey, CA 93940
PHONE: (831) 647-9411 • FAX: (831) 647-8501

May 13, 2015

Mr. Eric D. Stevenson
Director, Technical Services Division
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Subject: Shared Near-Road CO, NO2, and $PM_{2.5}$ Monitoring Responsibilities

Dear Mr. Stevenson:

40 CFR Part 58 Subparts 58.10(a)(7), 58.13(e)(1), and Appendix D section 4.3.1, requires near-road monitoring of CO, NOx, and $PM_{2.5}$ to be performed to meet minimum federal requirements for the San Jose-Sunnyvale-Santa Clara Core Based Statistical Area (CBSA), 41940. The Bay Area Air Quality Management District (BAAQMD) established a near-road monitor in San Jose on September 1, 2014 and will take responsibility for meeting these near-road requirements as they currently exist. The Monterey Bay Unified Air Pollution Control District (MBUAPCD) currently does not operate any Near-Road CO, NO2, and $PM_{2.5}$ monitors in this MSA and would like this letter to serve as a monitoring agreement between our two agencies.

The MBUAPCD requests the Bay Area Air Quality Management District reply to this letter confirming agreement to continue operation of the Near-Road CO, NO2, and $PM_{2.5}$ monitors at San Jose-Knox Avenue and advise MBUAPCD if changes to this instrument are planned.

	AQS#	Parameter	Method	POC
San Jose	060850006	42101	054	1
San Jose	060850006	42602	074	1
San Jose	060850006	88101	170	1

Sincerely,

Michael J Gilroy
Deputy Air Pollution Control Officer
Monterey Bay Unified Air Pollution Control District
24580 Silver Cloud Court
Monterey, CA 93940
(831) 647-9411

Appendix F. Request to end monitoring of NOy at the San Jose NCore site.

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

March 3, 2014

Ms. Meredith Kurpius, Ph.D.
Manager, Air Quality Analysis Office
United States Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Ms. Kurpius:

Since January 2011, the Bay Area Air Quality Management District (Air District) has been operating a federally mandated NOy instrument as part of EPA NCore requirements at our San Jose NCore site; AQS ID 06-085-0005. Hourly average data from this monitor have been submitted to the EPA AQS data base using the required method code 599 and parameter code 42600.

Analysis of 24 hourly NOx vs. NOy averages indicate statistically insignificant differences between NOx and NOy measurements as demonstrated in the three figures (24 hr NOx vs NOy correlation, by year) included below. To enable more efficient utilization of both fiscal and personnel resources within the Air District Air Monitoring Section, we are requesting that the EPA Administrator grant a waiver permitting NOx monitoring to be substituted for the required NOy monitoring at the Air District NCore site, as allowed in ***40CFR Part 58 Appendix D.3: Design Criteria for NCore Sites.***

The EPA NCore requirements from 40CFR Part 58 Appendix D.3: Design Criteria for NCore Sites as last amended on Dec. 27th 2010 includes the following in paragraph 3 (b) (1);

Although the measurement of NOy is required in support of a number of monitoring objectives, available commercial instruments may indicate little difference in their measurement of NOy compared to the conventional measurement of NOX, particularly in areas with relatively fresh sources of nitrogen emissions. Therefore, in areas with negligible expected difference between NOy and NOX measured concentrations, the Administrator may allow for waivers that permit NOX monitoring to be substituted for the required NOy monitoring at applicable NCore sites.

All data represented in the figures below is available for further analysis in the EPA AQS data base, or can be provided upon request if independent verification by EPA is desired. We propose to close this monitor immediately upon receipt of the Administrator's letter providing the requested waiver.

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Please contact Glen Colwell at (415) 749-4672 if you have any questions or concerns.

Sincerely,

Eric D. Stevenson
Director of Technical Services

cc: K. Hoag, EPA Region 9
G. Yoshimura, EPA Region 9
E. Felix, EPA Region 9

cc: K. Malone,
M. Flagg, EPA Region 9

Figure 1 – NCore BAAQMD San Jose: NOx vs. NOy 2013 24 Hr Correlation: R2 = 0.995

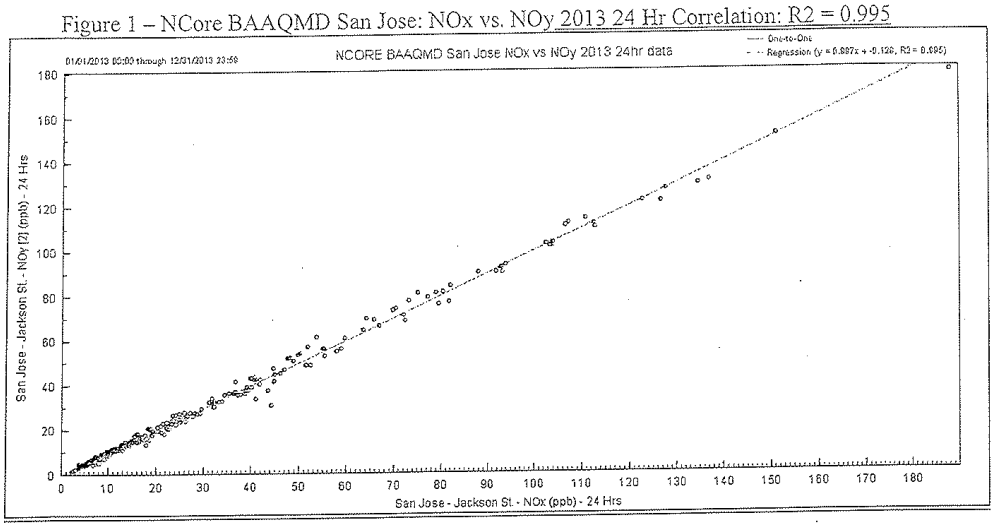

Figure 2 – NCore BAAQMD San Jose: NOx vs. NOy 2012 24 Hr Correlation: R2 = 0.994

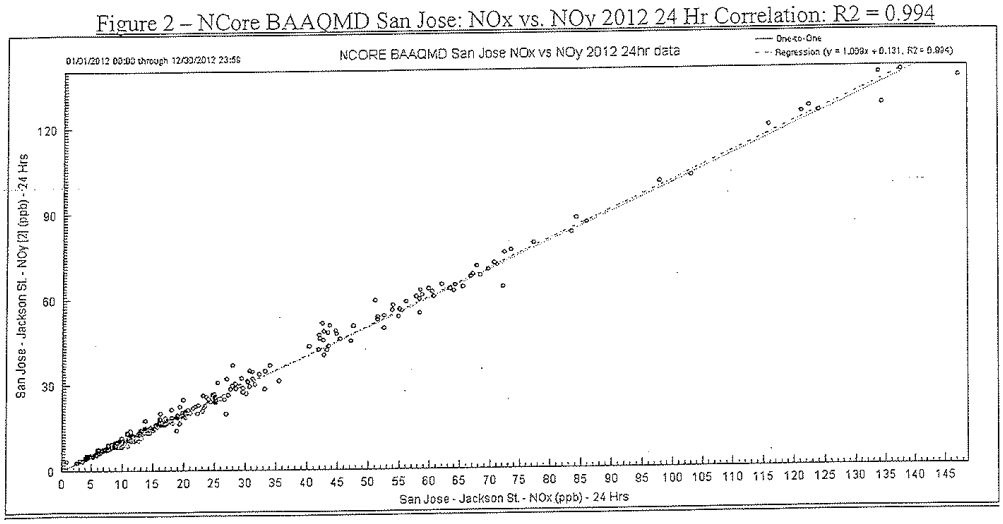

Figure 3 – NCore BAAQMD San Jose: NOx vs. NOy 2011 24 Hr Correlation: R2 = 0.996