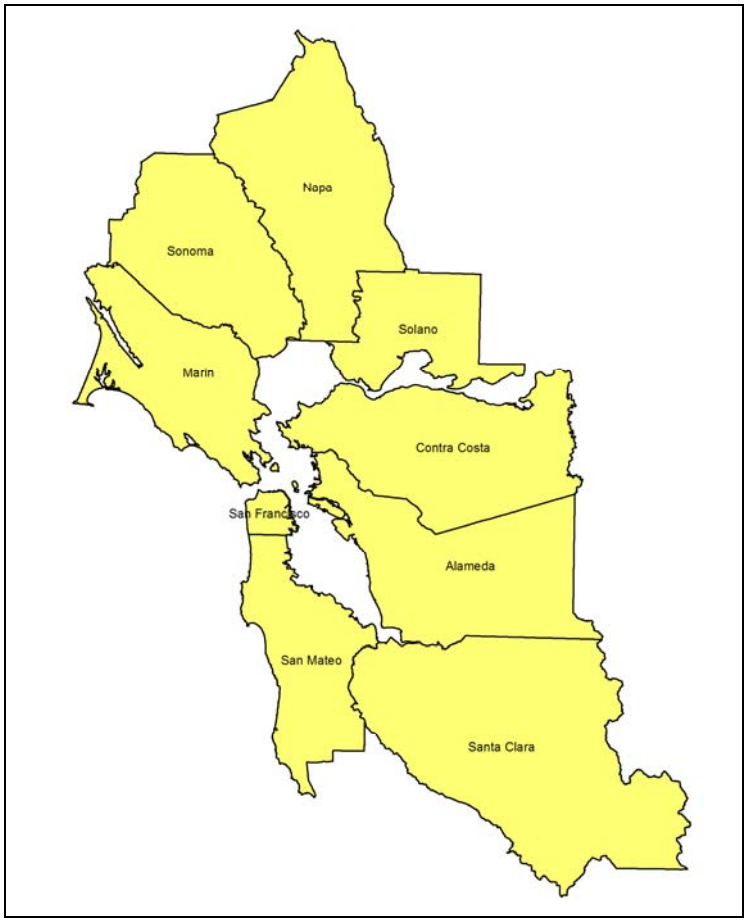
BAY AREA AIR QUALITY MANAGEMENT DISTRICT

2008 Air Monitoring Network Plan

Submitted: July 1, 2009



Dick Duker
Michael Basso
Ken Crysler
Kurt Malone
and
Mark Stoelting

Technical Services Division

Table of Contents

Section **Page**

List of Figures 4
List of Tables 4
Definition of Terms 5
Overview of Network Operation 6
Network Design 6
Minimum Monitoring Requirements for SLAMS Sites 12
Modifications Made to Network in 2008 16
Proposed Modifications to Network in 2009 18
Removing a NAAQS Compliance Monitor 20
Data Submission Requirement 21
Site Information Definitions 22
Detailed Site Information for SLAMS Stations 24
Bethel Island 24
Concord 26
Fairfield 29
Fremont 31
Gilroy 34
Hayward 36
Livermore 38
Los Gatos 41
Martinez 43
Napa 45
Oakland 48
Pittsburg 50
Point Reyes 53
Point Richmond 55
Redwood City 57
Richmond 7th 60
Rodeo 62
San Francisco 64
San Jose 67
San Leandro 70
San Martin 72
San Pablo 74
San Rafael 76
Santa Rosa 78
Sunnyvale 80
Vallejo 82

Table of Contents

Section **Page**

Detailed Site Information for non-SLAMS Monitors 86
Benicia 86
Berkeley 90
Crockett 94
Cupertino 96
Oakland PM2.5 SPM 98
National Air Toxics Trends Station (NATTS) at San Jose 100
$PM_{2.5}$ Speciation Sampling Program 103
Toxics Program 105
Appendix A. NCore Monitoring Station Plan for San Jose, California A-1

List of Figures

Figure		Page
1.	Map of Air District SLAMS and SPM Sites for 2008	11
2.	Map of Air District Toxics Monitoring Sites for 2008	106

List of Tables

Table		Page
1.	SLAMS Monitoring Objectives and Appropriate Spatial Scales	8
2.	List of Monitoring Stations within the Air District for 2008	9
3.	Minimum Monitoring Requirements for Ozone SLAMS Sites	12
4.	Minimum Monitoring Requirements for $PM_{2.5}$ SLAMS Sites	13
5.	Minimum Monitoring Requirements for PM_{10} SLAMS Sites	14
6.	Monitor Information and EPA Air Monitoring Siting Criteria	22
7.	List of the 14 NATTS HAPs Monitored by the Air District	100
8.	List of 22 NATTS PAH Compounds Measured by the Air District	102
9.	SASS Speciation Measurements for $PM_{2.5}$ Samples Collected by the Air District	104
10.	List of Toxic Compounds Measured by the Air District in 2008	107

Definition of Terms

ADT …….	Average Daily Traffic
AQS …….	Air Quality System; the EPA national air quality database
Air District ……	Bay Area Air Quality Management District
BAM ……	Beta Attenuation Monitor, a type of continuous $PM_{2.5}$ monitor
CFR …….	Code of Federal Regulations
CO ……	Carbon Monoxide
CH_4 …….	Methane
CSN ……..	Chemical Speciation Network
Design Value …	A calculated concentration, using a methodology specific to each pollutant, which is compared with the applicable national standard to determine the attainment status of an area for that pollutant.
EPA …….	U. S. Environmental Protection Agency
FRM …….	Federal Reference Method
GIS ……...	Geographic Information System
HC ……	Hydrocarbons, including CH_4 and NMOC
HiVol ……	High Volume
H_2S …….	Hydrogen Sulfide
KM ……	Kilometer (0.62 miles per kilometer)
M ……..	Meters
Maintenance Plan..	A Plan submitted by states to EPA that outlines how the NAAQS will be maintained for a particular region.
MSA …….	Metropolitan Statistical Area
N/A ……...	Not Applicable
NAAQS ……	National Ambient Air Quality Standards
NATTS ……..	National Air Toxics Trends Stations
NMOC ……..	Non-methane Organic Carbon
NO_2 ……...	Nitrogen Dioxide
O_3 ……...	Ozone
PM …….	Particulate Matter
$PM_{2.5}$……...	Particulates less than or equal to 2.5 microns in size measured using a filter-based monitor
$PM_{2.5cont}$……...	Particulates less than or equal to 2.5 microns in size measured using a continuous monitor
PM_{10} ……...	Particulates less than or equal to 10 microns in size
RAAS …….....	Reference Ambient Air Sampler
S …….....	Seconds
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

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 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 2008 there were 26 permanent stations in the Air District air monitoring network plus one permanent station operated by the California Air Resources Board.

In addition to the 26 permanent stations in the Bay Area, the Air District also performs short term monitoring at other sites. For these sites, re-locatable trailers and shelters are placed at a location for a minimum of one year to characterize the area's air quality. The instruments are operated on the same sampling schedule as the permanent network which allows comparison with other sites. Statistical relationships can be made with nearby permanent sites, thereby allowing estimates of air quality at the temporary sites in future years after the instruments have been removed to a new location. Two such relocatable trailers capable of monitoring all criteria pollutants and toxic pollutants were installed in 2008; one in Benicia adjacent to the Valero Refinery, and a second trailer was located in West Berkeley downwind from Pacific Steel Casting Company and Interstate 80. A temporary shelter containing a continuous PM_{10} sampler was also operated in Cupertino, near the Lehigh Cement Plant.

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 purpose of the Air District monitoring network is:

- 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 monitoring network 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 intended to characterize air pollution levels in areas of high pollution, high population, transported air pollution, and air pollution near specific sources.

Ambient air monitoring at Air District stations is intended to meet one or more of the following monitoring objectives:

- A determination of typical concentrations in areas of high population density.
- A determination of the highest concentrations expected to occur in the area covered by the network.
- A determination of impacts from significant sources.
- A determination of general background concentration levels.
- A determination of the extent of regional pollutant transport.

Population Oriented

As the primary purpose of air quality standards is to protect the public health, air monitoring stations have been placed in areas with high population density to determine the air pollution levels to which the majority of the population is exposed. In most cases these are within the largest cities of each county. Because people spend more time at home than at work, air monitoring sites generally have been located in residential areas rather than downtown locations. To be consistent with EPA's list of Site Types in Table D-1 of 40CFR Part 58, the term "population orientated" will be used in place of "typical concentrations in areas of high population density", for clarity in this monitoring objective.

Highest Concentration

EPA regulations require that air quality in areas where the public has access be reduced to levels below the national ambient air standards. Consequently, monitoring must also be done at locations expected to have the highest concentrations, 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.

Source Impact

There are five refineries within the Air District: Chevron, Shell, Tesoro, ConcocoPhillips, and Valero. Because these sources have the potential to emit significant amounts of SO_2 and H_2S, the Air District operates SO_2 and H_2S monitoring stations near these sources. When the monitors downwind of the source show concentrations above the applicable standards or exceed concentrations listed in Air District Regulation 9, Rules 1 and 2, a notice of violation may be issued to the source.

General Background

The Air District operates stations 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. When designing control strategies to reduce pollution levels, it is important to know if areas outside the boundaries of the Air District are contributing to high pollutant levels within the Air District. 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 transported into the Bay Area Air District 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.

Each monitoring objective is associated with a spatial scale for each site. 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 monitoring objective.

Table 1. SLAMS Monitoring Objectives and Appropriate Spatial Scales.

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

The desired spatial scale of a monitoring site 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. Additionally, the spatial scale can also be affected if trees or obstructions are too close to the monitoring probe. The goal in siting monitoring stations is to match the spatial scale with the desired monitoring objective. Table 2 lists the stations, their monitoring objectives, and the pollutants measured at each site.

Table 2. List of Monitoring Stations within the Air District for 2008.

Site	SLAMS Stations	Type[1]	Monitoring Objective	Pollutants Monitored[1]
1	Bethel Island	SLAMS	Regional Transport& Highest Concentration	O_3, NO_2, SO_2, CO, PM_{10}
2	Concord	SLAMS	Population Oriented, Highest Concentration	O_3, NO_2, SO_2, CO, HC, PM_{10}, $PM_{2.5}$
3	Fairfield	SLAMS	Population Oriented & Regional Transport	O_3
4	Fremont	SLAMS	Population Oriented	O_3, NO_2, CO, HC, PM_{10}, $PM_{2.5}$
5	Gilroy	SLAMS	Population Oriented, Highest Concentration, & Regional Transport	O_3, $PM_{2.5}$
6	Hayward	SLAMS	Population Oriented & Regional Transport	O_3
7	Livermore	SLAMS	Population Oriented & Highest Concentration	O_3, NO_2, CO, HC, PM_{10}, $PM_{2.5}$, $PM_{2.5cont}$, Speciated $PM_{2.5}$
8	Los Gatos	SLAMS	Population Oriented & Highest Concentration	O_3
9	Martinez	SLAMS	Source Impact	SO_2
10	Napa	SLAMS	Population Oriented	O_3, NO_2, CO, PM_{10}, $PM_{2.5cont}$
11	Oakland	SLAMS	Population Oriented	O_3, NO_2, CO
12	Pittsburg	SLAMS	Population Oriented	O_3, NO_2, SO_2,CO, PM_{10}
13	Pt Reyes[2]	SLAMS	General Background	$PM_{2.5cont}$
14	Pt Richmond	SLAMS	Source Impact	H_2S
15	Redwood City	SLAMS	Population Oriented	O_3, NO_2, CO, PM_{10}, $PM_{2.5}$, $PM_{2.5cont}$
16	Richmond 7th	SLAMS	Source Impact	SO_2, H_2S
17	Rodeo	SLAMS	Source Impact	H_2S
18	San Francisco	SLAMS	Population Oriented	O_3, NO_2, SO_2, CO, HC, PM_{10}, $PM_{2.5}$, $PM_{2.5cont}$
19	San Jose	SLAMS	Population Oriented & Highest Concentration	O_3, NO_2, CO, HC, PM_{10}, $PM_{2.5}$, $PM_{2.5cont}$
20	San Leandro	SLAMS	Population Oriented	O_3
21	San Martin	SLAMS	Highest Concentration	O_3
22	San Pablo	SLAMS	Population Oriented	O3, NO_2, SO_2, CO, PM_{10}
23	San Rafael	SLAMS	Population Oriented	O_3, NO_2, CO, PM_{10}
24	Santa Rosa	SLAMS	Population Oriented	O_3, NO_2, CO, PM_{10}, $PM_{2.5}$
25	Sunnyvale	SLAMS	Population Oriented	O_3
26	Vallejo	SLAMS	Population Oriented	O_3, NO_2, SO_2, CO, PM_{10}, $PM_{2.5}$, $PM_{2.5cont}$, Speciated $PM_{2.5}$

Table 2 continued. List of Monitoring Stations within the Air District for 2008.

Site	Non-SLAMS Stations	Type[1]	Monitoring Objective	Pollutants Monitored[1]
27	Benicia	SPM	Population Oriented & Source Impact	O_3, NO_2, SO_2, CO, PM_{10}, $PM_{2.5cont}$
28	Berkeley	SPM	Population Oriented & Source Impact	O_3, NO_2, SO_2, CO, HC, PM_{10}, $PM_{2.5cont}$
29	Crockett	SPM	Source Impact	SO_2
30	Cupertino	SPM	Population Oriented & Source Impact	PM_{10cont}
31	Oakland	SPM	Population Oriented	$PM_{2.5}$
32	San Jose	STN	Population Oriented	Speciated $PM_{2.5}$
33	San Jose	NATTS	Population Oriented	CO, Toxics, Black Carbon

[1] See page 3 for acronym definitions.
[2] Operated by the California Air Resources Board.

EPA suggests that the appropriate spatial scale for population oriented sites should be neighborhood or urban. Using the current EPA methodology to determine spatial scales, the air monitoring sites in Napa, Oakland, San Pablo and San Rafael would be characterized as middle scale. However, the Air District believes the spatial scale of the site would be better characterized as neighborhood scale. This is because EPA's distance requirements from roads are based on 1979 vehicle emission levels. Current fleet average vehicle emission factors in the Bay Area are 95% lower for HC, 94% lower for CO, 81% lower for NO_x, and 47% lower for PM_{10} in 2008 compared to 1979.

Figure 1 is a map of the 2008 Air District SLAMS and SPM monitoring sites. Tables 3, 4 and 5 list the minimum number of monitors required within the network for each pollutant. The section following Table 5 describes recent changes to the monitoring network, and proposed changes to the monitoring network.

The final section provides detailed descriptions of the monitoring objectives for each air monitoring site and a brief explanation for choosing the type of monitor at each site.

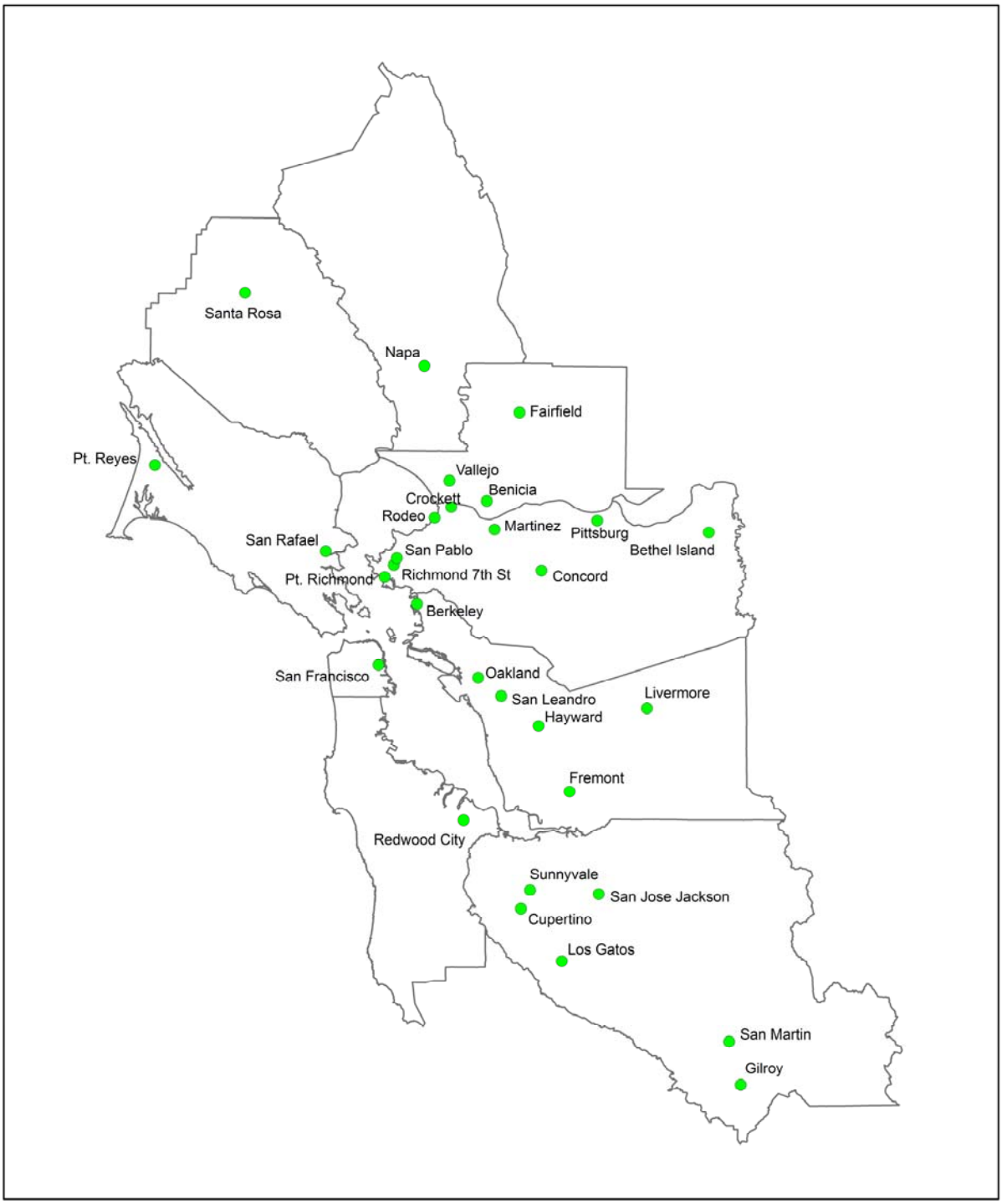


Figure 1. Map of Air District SLAMS and SPM Sites for 2008.

Minimum Monitoring Requirements for SLAMS Sites

Minimum Monitoring Requirements for Ozone

The number of required ozone monitors for each MSA in the Bay Area is determined by its population and design value, as specified in Table D-2 of 40 CFR Part 58, Appendix D – SLAMS Minimum O_3 Monitoring Requirements. Ozone design values are a calculated concentration (see footnote no.1 below) which are used for comparison with the national standard to determine the attainment status of an area for that pollutant. Table 3 shows that the Air District monitoring network meets or exceeds the ozone minimum monitoring requirements. No additional monitors have been required in the State Implementation Plan (SIP) or Maintenance Plan for ozone.

Table 3. Minimum Monitoring Requirements for Ozone SLAMS Sites.

MSA	County	Population (2008)	8-hour Design Value[1] (ppb) 2006-08	Number of Monitors Required	Number of Monitors Active	Additional Monitors Needed
San Francisco-Oakland-Fremont	SF, Marin, Alameda, San Mateo, Contra Costa	4,274,531	81	3	11	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,819,198	76	2	6[3]	0
Santa Rosa-Petaluma	Sonoma[4]	402,217	51	1[2]	1	0
Vallejo-Fairfield	Solano[5]	285,664	68	2	2	0
Napa	Napa	133,433	61	0[2]	1	0

[1] Design values are calculated at each monitoring site by taking the 3-year mean of the 4th highest 8-hour concentration. The MSA design value is the highest design value in the MSA. Design values at or below the 0.075 ppm National Ambient Air Quality 8-hour Ozone Standard meet the standard.

[2] Requirements based on design value concentrations <85% of the 0.07 ppm national ozone standard.

[3] One of the monitors is located in Hollister in San Benito County and is operated by the Monterey Bay Unified Air Pollution Control District.

[4] That portion of Sonoma County within the Bay Area Air Quality Management District.

[5] That portion of Solano County within the Bay Area Air Quality Management District.

Minimum Monitoring Requirements for $PM_{2.5}$

The number of required $PM_{2.5}$ monitors for each MSA in the Bay Area is determined by its population and design value, as specified in Table D-5 of Appendix D to Part 58 – $PM_{2.5}$ Minimum Monitoring Requirements. $PM_{2.5}$ design values are a calculated concentration (see footnotes no.1 & 2) which are used for comparison with the national standard to determine the attainment status of an area for that pollutant. Table 4 shows that the Air District monitoring network meets or exceeds the $PM_{2.5}$ minimum monitoring requirements. No additional monitors are required for the State Implementation Plan (SIP) or Maintenance Plan because the Bay Area has never been designated as non-attainment for $PM_{2.5}$, and no SIP or Maintenance Plans have been prepared for $PM_{2.5}$.

Table 4. Minimum Monitoring Requirements for $PM_{2.5}$ SLAMS Sites.

MSA	County	Population (2008)	Annual Design Value[1] µg/m^3 2006-08	Daily Design Value[2] µg/m^3 2006-08	Number of Monitors Required	Number of Monitors Active	Additional Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,274,531	9.4	36	3	5	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,819,198	11.1	36	3	3[3]	0
Santa Rosa-Petaluma	Sonoma[4]	402,217	8.1	30	1	1	0
Vallejo-Fairfield	Solano[5]	285,664	9.8	36	1	1	0
Napa	Napa	133,433	N/A[6]	N/A[6]	0	0	0

[1] Annual design values are calculated at each monitoring site by taking the 3-year mean of the annual averages for each site and using the highest value in the MSA. Design values at or below the national $PM_{2.5}$ annual standard of 15 µg/m^3 indicate the area meets the standard.

[2] Daily design values are calculated by taking the 3-year mean of the 98th percentiles for each site and using the highest value in the MSA. Design values at or below the national $PM_{2.5}$ 24-hour standard of 35 µg/m^3 indicate the area meets the standard.

[3] One of the monitors is located in Hollister in San Benito County and is operated by the Monterey Bay Unified Air Pollution Control District.

[4] That portion of Sonoma County within the Bay Area Air Quality Management District.

[5] That portion of Solano County within the Bay Area Air Quality Management District.

[6] There are no EPA FRM or FEM $PM_{2.5}$ monitors in Napa County.

Minimum Monitoring Requirements for PM_{10}

The number of required PM_{10} monitors for each MSA in the Bay Area is determined by its population and design value, as specified in Table D-4 of Appendix D to Part 58 – PM_{10} Minimum Monitoring Requirements. PM_{10} design values are a calculated concentration (see footnote no.1) which are used for comparison with the national standard to determine the attainment status of an area for that pollutant. Table 5 shows that the Air District monitoring network meets or exceeds the PM_{10} minimum monitoring requirements. No additional monitors are required for the State Implementation Plan (SIP) or Maintenance Plan because the Bay Area has never been designated as non-attainment for PM_{10}, and no SIP or Maintenance Plans have been prepared for PM_{10}.

Table 5. Minimum Monitoring Requirements for PM_{10} SLAMS Sites.

MSA	County	Population estimate (2008)	Daily Design[1] Value µg/m^3 2006-08	Number of Monitors Required	Number of Monitors Active	Additional Monitors Needed
San Francisco-Oakland-Fremont	SF, San Mateo, Alameda, Marin, Contra Costa	4,274,531	83.6	2	5	0
San Jose-Sunnyvale-Santa Clara	Santa Clara, San Benito	1,819,198	103.9	2	2[2]	0
Santa Rosa-Petaluma	Sonoma[3]	402,217	87.1[5]	0	1[6]	0
Vallejo-Fairfield	Solano[4]	285,664	49.1[5]	0	1[6]	0
Napa	Napa	133,433	48.6	0	1	0

[1] For PM_{10}, the design value is defined as the expected number of exceedances per year, which is calculated by averaging the number of exceedances for the past 3 years. Since there were no exceedances in the past 3 years, the PM_{10} design value is zero for all MSA's within the Bay Area Air Quality Management District. The 24-hour standard (150 µg/m^3) is attained when the design value is less than or equal to one. Instead of the PM_{10} design value, the number shown in this column is the highest 24-hour PM_{10} concentration in 2006-2008.

[2] One of the monitors is located in Hollister in San Benito County and is operated by the Monterey Bay Unified Air Pollution Control District.

[3] That portion of Sonoma County within the Bay Area Air Quality Management District.

[4] That portion of Solano County within the Bay Area Air Quality Management District.

[5] Since the one PM_{10} monitor in the BAAQMD portion of this MSA was closed in 2008, the value is the highest 24-hour PM_{10} concentration in 2006-2007.

[6] The one PM_{10} monitor is this MSA was closed on June 30, 2008.

Minimum Monitoring Requirements for NO_2

40 CFR, Part 58, Appendix D, Section 4.3 states that there are no minimum requirements for the number of NO_2 monitoring sites. No additional monitors are required for the SIP or Maintenance Plans, because the Air District has never been designated as non-attainment for NO_2, and no SIP or maintenance plans have been prepared for NO_2. The Air District has NO_2 monitors at all full stations because NO_2 and NO are important precursors in ozone formation, and they provide a Q/C function for ozone monitors. NO_2 monitoring may become important in the future because California has revised the 1-hr NO_2 standard and added an annual NO_2 standard, effective March 20, 2008. Also, as particulate control devices are added to heavy duty diesel vehicles, ambient NO_2 concentrations may increase because of increases in the NO_2/NO_x ratio in exhaust. The Air District currently operates 16 NO_2 monitors in its network.

Minimum Monitoring Requirements for SO_2

40 CFR, Part 58, Appendix D, Section 4.4 states that there are no minimum requirements for the number of SO_2 monitoring sites. No additional 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. The Air District operates 11 SO_2 monitors in its network.

Minimum Monitoring Requirements for CO

40 CFR, Part 58, Appendix D, Section 4.2 states that there are no minimum requirements for the number of CO monitoring sites. No additional monitors are required for SIP or Maintenance Plans. The Air District was re-designated attainment for the 8-hour average CO NAAQS in 1998. The Air District carbon monoxide maintenance plan is contained within the California Air Resource Board document "2004 Revision to the California State Implementation Plan for Carbon Monoxide." The maintenance plan does not specify the number of CO monitors needed. Generally, the Air District operates one CO monitor within each of the nine Bay Area counties plus additional CO monitors in large cities. Also, CO monitors are used to provide a Q/C function at full stations. CO monitoring could take on future importance because EPA is expected to review the current CO NAAQS and may revise the NAAQS to be more stringent. The Air District currently operates 16 CO monitors in its network.

Modifications Made to Network in 2008

Benicia

The temporary Benicia monitoring station was closed on December 31, 2008. The station operated from April 2007 through December 2008. Monitoring included O_3, SO_2, NO_2, NO, CO, continuous $PM_{2.5}$, PM_{10}, toxics, metals, and aldehydes. The purpose of the monitoring study was to characterize the air quality levels in Benicia near the Valero Refinery. During the monitoring period, all pollutants were below State and national standards except ozone, which had three days that exceeded the 8-hour national ozone standard, and $PM_{2.5}$, which had nine days that exceeded the 24-hour national standard, seven of which occurred during the summer 2008 wildfires.

Cupertino

The Air District installed a continuous PM_{10} monitor at a site in Cupertino near the Lehigh Cement Plant. The purpose is to determine if the residential area downwind of the cement plant and associated truck traffic are experiencing elevated particulate levels. The monitoring began in November 2008 and will continue through the end of 2009. Hourly PM_{10} and meteorological data from the site may be viewed on the Air District's real time air quality web page at http://gate1.baaqmd.gov/aqmet/aq.aspx.

Particulate Matter (PM10) Sites

The Air District made substantial changes to its PM_{10} network in 2008. Many years of monitoring have shown that Bay Area PM_{10} levels are well below both the 24-hour and annual national PM_{10} standards. Consequently, the Air District decided to reallocate resources by reducing the density of its PM_{10} network. Six PM_{10} monitors were shut down (Fremont, Livermore, Pittsburg, Redwood City, Santa Rosa, and Vallejo). These closures allow the expansion of the Air District's particulate network to add $PM_{2.5}$ speciation samplers at air monitoring stations in Livermore, Vallejo, and Oakland. These samplers give information about the composition of ambient $PM_{2.5}$ which is needed to determine the sources of $PM_{2.5}$. This is important because the Bay Area currently does not meet the national 24-hour $PM_{2.5}$ standard.

Pittsburg

The Pittsburg air monitoring station was closed at the end of 2008. New construction in the area and a large increase in the lease cost made this closure necessary. Pollution levels in Pittsburg have been found to be lower than nearby sites in Concord, Fairfield and Bethel Island. The national 8-hour ozone and the State 24-hour PM_{10} standards were exceeded within the most recent 5 years at Pittsburg, but pollutant levels are lower than nearby stations.

San Francisco

$PM_{2.5}$ monitoring was changed from everyday to every third day during the October 1st through March 31st winter season. This change was made on January 15, 2008 because recent measurements at the station showed that its 2005-2007 29 $\mu g/m^3$ $PM_{2.5}$ design value was not within 5% of the standard and consequently, everyday filter monitoring is not

required to demonstrate the attainment status of the 24-hour National Ambient Air Quality Standard. Additional $PM_{2.5}$ measurements are made at the station every day using a continuous (non-filter) $PM_{2.5}$ monitor, which produces hourly data. Although these data are valuable for forecasting and emissions estimates, data from the monitor can not be used for comparison with the national standards because the existing continuous $PM_{2.5}$ monitor (BAM) is not EPA certified.

SO_2 monitoring was discontinued because there are no longer any major sources of SO_2 in the vicinity of San Francisco, and data from the most recent five years have not shown any elevated levels of ambient SO_2.

San Jose

As part of the NATTS monitoring project, beginning in January 2008, toxics metals are now analyzed from PM_{10} samples collected at the San Jose station. Analyses are performed by an EPA contract laboratory. See the NATTS program description near the end of this document.

San Leandro

The Air District shut down the ozone monitor at San Leandro in 2008 because the new Oakland station, which opened in 2007, is close enough to San Leandro (the sites are 3 miles apart) to characterize the area. There have been no national exceedances of the ozone standard in the most recent 5 years at San Leandro. No other pollutants are measured at San Leandro, so the San Leandro station was closed.

Speciated PM2.5 Monitoring (CSN Program)

The Air District began speciated $PM_{2.5}$ monitoring at the Livermore and Vallejo air monitoring stations in 2008. The purpose of the monitoring is to collect data on the chemical makeup of the ambient $PM_{2.5}$ particles in the Bay Area. Samples are collected on filters and sent to a contract laboratory for analyses. Pollutants measured are selected ions, metals, carbon species, and organic compounds in $PM_{2.5}$. See the program description near the end of this document.

Sunnyvale

The Air District shut down the ozone monitor at Sunnyvale in 2008 because studies have shown that ozone levels at Sunnyvale are well correlated with ozone levels at the San Jose station, and generally not as high as those at the nearby station in Los Gatos, and therefore the site is not needed. There were two days with exceedances of the national 8-hour ozone standard in the most recent 5 years at Sunnyvale. The toxics monitor was also shut down because 7 years of data have shown that toxics levels are low. As no other pollutants are measured at Sunnyvale, the station was closed.

Vallejo

$PM_{2.5}$ monitoring was changed from every third day to everyday during the October 1st through March 31st winter season. This change was made on January 15, 2008 because

measurements at the station showed that its 2005-2007 36 µg/m^3 $PM_{2.5}$ design value is within 5% of the 24-hour National Ambient Air Quality Standard.

Proposed Modifications to Network in 2009

Berkeley

The Air District began operation of a temporary air monitoring station in Berkeley on December 13, 2007. The site will be shut down at the end of 2009. The purpose of the monitoring study is to determine air quality in West Berkeley downwind of Highway 80 and Pacific Steel Casting. Monitoring includes O_3, SO_2, NO_2, NO, CO, Non-Methane Hydrocarbons, Methane, continuous $PM_{2.5}$, PM_{10}, toxics, metals, and aldehydes. Data from the site may be viewed on the Air District's real time air quality web page at http://gate1.baaqmd.gov/aqmet/aq.aspx

Concord

A collocated $PM_{2.5}$ monitor at Concord has been operated once every 6 days to collect a 24-hour sample which is compared with the sample from the primary $PM_{2.5}$ sampler as a method of checking the precision of the primary monitor. Over the past 10 years, concentrations from the two monitors have shown good agreement. New regulations from EPA currently only require collocated $PM_{2.5}$ measurements every 12th day. The Air District plans to change operation of the collocated $PM_{2.5}$ monitor from a one in six day schedule to a one in twelve day schedule. The primary monitor will continue to be operated every day during the winter and every 3rd day during the summer.

Contra Costa County

The Air District is considering locating a monitoring trailer to a location in northeastern Contra Costa County. This is an area of rapid development, and a one-year monitoring study would demonstrate if further monitoring is needed. Monitoring would include O_3, SO_2, NO_2, NO, CO, continuous $PM_{2.5}$, PM_{10}, and toxics.

Denverton

The Air District is proposing to monitor NO_x and ozone at a site near Denverton along Highway 12 in Solano County beginning in 2009. The purpose will be to measure NO_x and ozone transport between the Bay Area and the Sacramento Valley. This site will also have a meteorological system, operated by CARB. The monitors will be operated for 3 years.

Lead Monitoring

On October 15, 2008, EPA strengthened the National Ambient Air Quality Standard for lead by lowering it from 1.5 µg/m^3 to 0.15 µg/m^3. The regulation requires that lead monitoring begin by January 1, 2010 in air districts with stationary sources having lead emissions greater than or equal to one ton per day. There are no stationary sources in the Bay Area that emit these levels of lead, so source-oriented lead monitoring will not be needed. Population-oriented lead monitoring will be needed in the Bay Area, and the Air District proposes to begin monitoring for lead at three locations by the January 1, 2011 deadline.

Livermore

Carbon monoxide monitoring will be discontinued in 2009 at the Livermore station to create space for an automatic gas chromatograph (GC). Carbon monoxide levels over the most recent 5 years at Livermore have been well below State and national standards, so further monitoring is not needed to show attainment. The GC is being added as part of the Precursor Air Monitoring Study listed below.

Oakland

The Air District has been operating a $PM_{2.5}$ monitor in Oakland since November 2007 to determine if $PM_{2.5}$ levels approach the State or national standards. Only one exceedance of the revised national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ has been recorded to date. If the remainder of 2009 continues to show values below the national standard, then the monitor will be removed in 2010.

Oakland West

The Air District located an air monitoring station in West Oakland in February 2009. It is located downwind of the Port of Oakland and measures SO_2, NOx, CO, black carbon, continuous $PM_{2.5}$, speciated $PM_{2.5}$, and toxics. It is intended to be a long-term site.

Precursor Air Monitoring Stations

EPA is funding the establishment of three precursor monitoring stations. Two sites would be new: one in San Ramon along the Highway 680 corridor and the other near Altamont Pass. A third site would be located at the current Livermore air monitoring station. All three sites will measure ozone, NO_2, NO, speciated hydrocarbons, and meteorology. The stations are expected to be operated for 3 years.

Particulate Matter (PM2.5) Sites

The Air District plans to replace filter-based $PM_{2.5}$ samplers with Federal Equivalent Method continuous $PM_{2.5}$ monitors at five stations in 2009: Fremont, San Francisco, Redwood City, Gilroy, and Santa Rosa. These sites were chosen because their design values (the average of 98^{th} percentile value from the most recent three years) are well below the national $PM_{2.5}$ standard and changing the monitoring method, which could slightly change the design value, will not affect the attainment status of these sites.

Particulate Matter (PM10) Sites

The Air District plans to replace high-volume PM_{10} samplers with low-volume PM_{10} samplers at the San Jose air monitoring station and will consider replacing high-volume PM_{10} samplers at other stations with low-volume PM_{10} samplers. These samplers use less power and are more accurate than the current high-volume PM_{10} technology, and are also needed to meet the PM coarse sampling requirements beginning in 2011.

San Jose

The Air District intends to designate the San Jose station as an NCORE site on January 1, 2011. Changes to the station to meet NCORE requirements are the addition of a trace SO_2 monitor and a meteorological system. A trace SO_2 monitor was added in February 2009. A

meteorological station will be added within the next 18 months. The Air District is requesting a waiver for the requirement to measure NO_y at the proposed NCORE station. The rational is that NO_y levels are so low that the data would be in the noise level of currently available measurement technology and therefore of little value. The Air District proposes to continue collecting NO_x as a surrogate for NO_y at the station.

San Pablo

The station ceased operation due to heavy damage from a fire in the building in March 2009. It is expected to reopen in early 2010.

School Air Toxics Monitoring Program

The EPA will fund a toxics monitoring program at schools across the country to gather data on whether outdoor toxic air pollution poses health concerns to schoolchildren. The Air District will participate in this nation-wide program by operating two samplers at the Stevens Creek Elementary School in Cupertino. The samplers will be operated on a 1 in 6 day schedule, and the samples sent to an EPA lab for analysis. The pollutant to be analyzed is Hexavalent chromium. Meteorological monitoring will also be conducted. Sampling will begin during the summer of 2009 and last three months.

South San Jose

The Air District may agree to operate a monitoring station near the Metcalf Energy Center power plant in South San Jose. This site is being established as part of an agreement between the City of San Jose and the Metcalf Energy Center. The station will be located in a residential neighborhood 1 mile northwest of the power plant and will monitor ambient levels of pollutants emitted by the power plant. Those pollutants are PM_{10}, NO_x, and CO. It is intended to be a long-term site. If the Air District takes over operation of the site, ozone levels may also be monitored as part of a special field study for 2 years.

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 to allow public comment on the proposed changes to the network. After the public comment period, the Air District reviews and considers the comments before making a final decision. The Air District then submits the Plan and any comments received to the EPA Region IX Regional Administrator.

Before shutting down a SLAMS (State or Local Air Monitoring Station) monitor, federal requirements require the Air District to obtain the Regional Administrator's written approval. The Regional Administrator will normally approve the shutdown when any of the following situations apply:

- Monitors that have always attained the national standards and that have not violated the national standards for the most recent 5 years may be closed if the State Implementation Plan (SIP) provides a method of representing the air quality in the applicable county.

- Monitors that were out of attainment of the national standards in the past and have not violated the national standards during the previous 5 years may be shut down if the probability is less than 10% that the monitor will exceed 80% of NAAQS during the next 3 years.
- Monitors may be removed on the basis of redundancy if it can be shown that concentrations are highly correlated ($r^2 > 0.75$) with a nearby monitor that shows consistently higher concentrations during the previous 5 years.
- Monitors which are located upwind of an urban area to characterize transport may be shut down if the monitor has not recorded any violations during the previous 5 years, and the monitor is being replaced by another monitor that characterizes transport.
- Monitors may be removed when EPA determines that measurements are not comparable to the relevant NAAQS because of siting issues.

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

- Precision/Accuracy reports are submitted monthly to the EPA AQS database.
- The 2008 annual data certification letter will be submitted to EPA Region 9 in June 2009.

Site Information Definitions

The next section describes each air quality station operated within the Bay Area Air Quality Management District. In 2008 there were 30 stations operating in the Air District: 26 long-term stations (SLAMS stations), and 4 temporary stations (SPM stations). Long-term stations are generally operated for decades, while temporary stations are expected to operate for 1 to 2 years.

The station description includes siting information about the station and the individual monitors at the station. Monitors must be operated following EPA requirements found in 40 CFR Part 58. These regulations also specify monitor siting criteria. Table 6 below lists these siting criteria where applicable.

Table 6. Monitor Information and EPA Air Monitoring Siting Criteria.

Pollutant	Pollutants measured at the Air District the air monitoring station.
Monitoring Objective	The purpose for monitoring at that location. Choices include Highest Concentration, Population Oriented, Source Impact, General Background, and Regional Transport.
Spatial scale	The relative distance over which the air pollution measurements are representative. Choices are Micro, Middle, Neighborhood, Urban, and Regional scales.
Sampling method	*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.
PM filter analysis method	Describes whether the PM filters are analyzed in-house by the local agency or at an outside laboratory.
Start date	The date valid data collection began for that pollutant at that air monitoring station.
Operation schedule	Describes if the monitor is operated continuously or intermittently (as for PM).
Sampling season	Most monitors operate all year, but some monitors may only operate during months when pollution potential is highest, e.g. ozone.
Distance to road from gaseous probe	*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.
Ground cover	*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.
Probe height (AGL)	*40 CFR Part 58 Appendix E, 2.0*: requires that probe height be 2-15 meters above ground level (AGL).
Probe height above roof	*40 CFR Part 58 Appendix E, 2.0*: requires the probe be at least 1 meter vertically or horizontally away from any supporting structure.
Distance from obstructions on roof	*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)

Table 6 continued. Monitor Information and EPA Air Monitoring Siting Criteria.

Distance from obstructions not on roof	*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 tree (DL)	*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	*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 NO. 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 collocated monitors	*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.
Unrestricted airflow	*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	*40 CFR Part 58, Appendix E, 9.0*: requires that either Pyrex glass or FEP Teflon be used for intake sampling lines.
Residence time	*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 mos?	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 $PM_{2.5}$?	*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 (gaseous)	*40 CFR Part 58 Appendix A, 3.2.1*: requires that QC checks be performed at least once every 2 weeks.
Last Annual Performance Evaluation (gaseous)	*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).
Last two semi-annual flow rate audits for PM monitors	*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 6 months.

Detailed Site Information for SLAMS Stations

Bethel Island

Bethel Island was chosen for an air monitoring site to measure pollutant transport between the California Central Valley and the San Francisco Bay Area. The site lies in the only sea-level gap between the two regions, in the Sacramento-San Joaquin River Delta, just east of the Carquinez Strait region. The local contribution to air quality is low due to the rural nature of the area and the lack of any industrial sources within 6 miles of the site. The nearest town is Bethel Island, 0.6 miles to the north, with a 2000 population estimate of 2,312. The site is located in a public-storage facility, surrounded by grassy fields. Ozone and NO_2 are measured because the area is in the transport corridor between the San Francisco Bay Area and the California Central Valley, both of which are major sources of ozone, ozone precursors, and particulates. Traffic volume near the site is low, so carbon monoxide 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.

During the most recent 3 years, the revised national 8-hour ozone standard of 75 ppb was exceeded 18 times at this site. The California 24-hour PM_{10} standard was exceeded four times in the most recent 3 years. No exceedances of any SO_2 standards were measured in the most recent 3 years.

A tree that had been within 10 meters of the instrument probe was removed on July 21, 2007. The site now meets all EPA siting criteria. Because the tree was outside of the 180 degree arc of unrestricted airflow in the predominant WNW wind direction, air quality data collected previous to the tree removal are considered valid.

Bethel Island Site Information

Site Name	Bethel Island - 2021
AQS ID	06-013-1002
GIS coordinates	Latitude: 38.0063° N, Longitude: 121.6419° W
Location	Trailer in parking lot
Address	5551 Bethel Island Rd, Bethel Island CA 94511
County	Contra Costa
Distance to road from gaseous probe	Bethel Island Rd: 63 meters Sandmound Blvd: 110 meters
Traffic count	Bethel Island Rd: 6,492 ADT (2006) Sandmound Blvd: 1,537 ADT (2006)
Groundcover	Gravel surrounded by grassy fields
Representative Area	San Francisco-Oakland-Fremont MSA

Bethel Island Monitor Information

Pollutant	O3	CO	NO/NO2	SO2	PM10
Monitoring Objective	Regional Transport & Highest Conc.	General Background	Regional Transport	Regional Transport	Regional Transport
Spatial scale	Regional	Regional	Regional	Regional	Regional
Sampling method	TECO 49i	TECO 48A	TECO 42C	TECO 43C	Andersen GUV-16HBLA
PM filter analysis method	N/A	N/A	N/A	N/A	Weighed by Air District
Start date	02/28/81	03/01/81	NO2: 03/01/81 NO: 01/01/94	03/01/81	11/05/86
Operation schedule	Continuous	Continuous	Continuous	Continuous	1 in 6
Sampling season	All year	All year	All year	All year	All year
Probe height (AGL)	6.7 m	6.7 m	6.7 m	6.7 m	5.2 m
Probe height above roof	3.0 m	3.0 m	3.0 m	3.0 m	1.5 m
Distance from obstructions on roof	None	None	None	None	None
Distance from obstructions not on roof	None	None	None	None	None
Distance from tree (DL)	13.3 m	13.3 m	13.3 m	13.3 m	14.4 m
Distance to furnace or incinerator flue	None	None	None	None	None
Distance between collocated monitors	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow	270°	270°	270°	270°	270°
Probe material	Teflon	Teflon	Teflon	Teflon	N/A
Residence time	14 s	15 s	15 s	14 s	N/A
Will there be changes within the next 18 mos?	No	No	No	No	No
Is it suitable for comparison against the annual PM2.5?	N/A	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	Weekly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	N/A
Frequency of one-point QC check (gaseous)	Daily	Daily	Daily	Daily	N/A
Last Annual Performance Evaluation (gaseous)	10/08/08	10/08/08	10/08/08	10/08/08	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A	10/07/08 04/22/08

Concord

Concord was chosen for an air monitoring site because it is the largest city in Contra Costa County, with a 2008 population estimate of 124,599; and because of the high pollution potential due to locally emitted and transported pollutants into the area. Since Concord is located in a valley, the Diablo Valley, locally emitted pollutants can become trapped when winds are light. Large emission sources in the valley include 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 a shopping center, near the intersection of two major streets, and surrounded by residential neighborhoods. There is no industry in the immediate vicinity. NMOC/CH_4 and NO_2 are 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 6 miles downwind from 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.

During the most recent 3 years, this site recorded 16 exceedances of the new 75 ppb national 8-hour ozone standard, and six exceedances of the California 24-hour PM_{10} standard. The revised national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ was exceeded on 15 days. No exceedances of any SO_2 standards were measured in the most recent 3 years.

Concord Site Information

Site Name	Concord - 2036
AQS ID	06-013-0002
GIS coordinates	Latitude: 37.9360° N, Longitude: 122.0262° W
Location	One story commercial building
Address	2956-A Treat Blvd, Concord CA 94518
County	Contra Costa
Distance to road from gaseous probe	Treat Blvd: 179 meters Oak Grove Rd: 241 meters
Traffic count	Treat Blvd: 41,218 ADT (2005) Oak Grove Rd: 26,742 ADT (2005) Interstate 680 266,000 ADT (2007)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Concord Monitor Information

Pollutant	O3	CO	NO/NO2	SO2	CH4/NMOC
Monitoring Objective	Population oriented & Highest Conc.	Population oriented	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Urban	Neighborhood
Sampling method	TECO 49i	TECO 48A	TECO 42C	TECO 43C	TECO 55C
PM filter analysis method	N/A	N/A	N/A	N/A	N/A
Data Start date	04/08/80	02/21/80	NO2: 02/01/80 NO: 01/01/87	02/01/80	CH4:12/31/99 NMOC: 05/10/06
Operation schedule	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year	All year	All year
Probe height (AGL)	9.2 m	9.2 m	9.2 m	9.2 m	9.2 m
Probe height above roof	3.1 m	3.1 m	3.1 m	3.1 m	3.1 m
Distance from obstructions on roof	None	None	None	None	None
Distance from obstructions not on roof	None	None	None	None	None
Distance from tree (DL)	24 m	24 m	24 m	24 m	24 m
Distance to furnace or incinerator flue	None	None	None	None	None
Distance between collocated monitors	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	Teflon	Teflon
Residence time	9 s	12 s	10 s	13 s	10 s
Will there be changes within the next 18 mos?	No	No	No	No	No
Is it suitable for comparison against the annual PM2.5?	N/A	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	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	N/A
Frequency of one-point QC check (gaseous)	Daily	Daily	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	07/30/08	07/30/08	07/30/08	07/30/08	07/30/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A	N/A

Concord Monitor Information

Pollutant	PM10**	FRM PM2.5*	FRM PM2.5* Collocated
Monitoring Objective	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Sampling method	Andersen HiVol 1200	*Partisol-Plus 2025 w/VSCC	*Partisol-Plus 2025 w/VSCC
PM filter analysis method	Weighed by Air District	Weighed by Air District	Weighed by Air District
Data Start date	11/04/86	03/19/99	03/19/99
Operation schedule	1 in 6	Apr-Sep: 1in 3 Oct-Mar: daily Col: 1 in 6	1 in 6
Sampling season	All year	All year	All year
Probe height (AGL)	5.8 m	5.9 m	5.9 m
Probe height above roof	1.5 m	2 m	2 m
Distance from obstructions on roof	None	None	None
Distance from obstructions not on roof	None	None	None
Distance from tree (DL)	15 m	11 m	> 11m
Distance to furnace or incinerator flue	None	None	None
Distance between collocated monitors	N/A	3.2 m	3.2
Distance between PM10 and PM2.5 monitors	7.5 m	7.5 m	4.4 m
Unrestricted airflow	360°	360°	360°
Probe material	N/A	N/A	N/A
Residence time	N/A	N/A	N/A
Will there be changes within the next 18 mos?	No	No	No
Is it suitable for comparison against the annual PM2.5?	N/A	Yes	Yes
Frequency of flow rate verification for manual PM samplers	Weekly	Monthly	Monthly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A
Frequency of one-point QC check (gaseous)	N/A	N/A	N/A
Last Annual Performance Evaluation (gaseous)	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	10/30/08 05/01/08	10/30/08 05/0108	10/30/08 05/0108

* Partisol-Plus 2025 replaced Andersen RAAS300 on 11/01/2008 (Primary FRM) and 09/30/2008 (Collocated FRM).
** PM10 discontinued on 06/30/2008.

Fairfield

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 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 into the Sacramento Valley from the Bay Area. Occasionally, easterly winds transport elevated ozone levels into this region from the Sacramento Valley. Over the past decade the Fairfield/Suisun City urban area has grown considerably, now having a combined 2008 population of 135,296, the largest urban area in Solano County. As a result, Fairfield is also a population oriented ozone monitoring site. The monitoring site is located in a rural area normally upwind (southwest) of the urban area.

During the most recent 3 years, this site recorded four exceedances of the 75 ppb national 8-hour ozone standard.

Fairfield Site Information

Site Name	Fairfield - 8007
AQS ID	06-095-0005
GIS coordinates	Latitude: 38.2271° N, Longitude: 122.0756° W
Location	Small trailer in open field
Address	1010 Chadborne Rd, Fairfield CA 94534
County	Solano
Distance to road from gaseous probe	Cordelia Rd: 194 meters
Traffic count	Cordelia Rd: 3,751 ADT (2007 estimate)
Groundcover	Vegetative
Representative Area	Vallejo-Fairfield MSA

Fairfield Monitor Information

Pollutant	**O3**
Monitoring Objective	Regional transport & Population oriented
Spatial scale	Regional
Sampling method	TECO 49C
Analysis method	N/A
Start date	05/29/02
Operation schedule	Continuous
Sampling season	Apr 1-Nov 30
Probe height (AGL)	3.7 m
Probe height above roof	1.0 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	>50 m
Distance to furnace or incinerator flue	None
Unrestricted airflow	360°
Probe material	Teflon
Residence time	5 s
Will there be changes within the next 18 mos?	No
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 (gaseous)	Daily
Last Annual Performance Evaluation (gaseous)	11/10/08
Last two semi-annual flow rate audits for PM monitors	N/A

Fremont

Fremont was chosen for an air monitoring site because it is the second largest city in Alameda County, with a 2007 population estimate of 213,512, and because it is downwind of large sources of ozone and ozone precursors. Studies have shown that on high ozone days, ozone is transported southward along the East Bay Hills into Fremont, with concentrations that may exceed the ozone standards. Fremont also has potential for high levels of particulate in the winter due to local emissions. The monitoring site is centrally located in Fremont, in a residential and commercial area. Ozone and its precursors, NMOC/CH_4 and NO_2, are measured because the area is downwind of populated and industrial portions of the San Francisco Bay Area, which can be large sources of ozone precursor emissions. Carbon monoxide is measured because of the high volume of traffic in the city, which includes two major freeways. $PM_{2.5}$ is collected because light winds combined with surface based-based inversions during the winter months can cause elevated particulate levels.

PM_{10} has been monitored at Fremont since 1989. There has never been an exceedance of the national 24-hour PM_{10} standard recorded at Fremont, and the highest concentration recorded in the last nine years was less than half of the standard. The Air District discontinued PM_{10} monitoring at the site on June 30, 2008 because no exceedances of the national PM_{10} standard are expected to occur based on monitoring history, and because PM_{10} levels can be estimated by $PM_{2.5}$ measurements at the site. In the Bay Area, highest PM_{10} concentrations can be approximated by multiplying the $PM_{2.5}$ concentrations by a factor of 1.5.

During the most recent 3 years, the revised national 8-hour ozone standard of 75 ppb was exceeded once at this site. The national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ was exceeded on four days in the last 3 years.

Fremont Site Information

Site Name	Fremont – 1014
AQS ID	06-001-1001
GIS coordinates	Latitude: 37.53584° N, Longitude: 121.96185° W
Location	One story commercial building
Address	40733 Chapel Way, Fremont CA 94538
County	Alameda
Distance to road from gaseous probe	Fremont Boulevard: 120.0 meters Chapel Way: 31.0 meters
Traffic count	Fremont Boulevard: 30,800 ADT (2005) Chapel Way: 500 ADT (estimate)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Fremont Monitor Information

Pollutant	O3	CO	NO/NO2	CH4/NMOC
Monitoring Objective	Population oriented	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	TECO 49i	TECO 48A	TECO 42C	TECO 55C
PM filter analysis method	N/A	N/A	N/A	N/A
Start date	07/29/76	01/01/71	NO: 07/01/76 NO2: 04/12/74	CH4: 01/01/94 NMOC: 05/25/06
Operation schedule	Continuous	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year	All year
Probe height (AGL)	8.4 m	8.4 m	8.4 m	8.4 m
Probe height above roof	4.3 m	4.3 m	4.3 m	4.3 m
Distance from obstructions on roof	None	None	None	None
Distance from obstructions not on roof	None	None	None	None
Distance from tree (DL)	25.9 m	25.9 m	25.9 m	25.9 m
Distance to furnace or incinerator flue	3.7 m	3.7 m	3.7 m	3.7 m
Distance between collocated monitors	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	Teflon
Residence time	15 s	15 s	15 s	15 s
Will there be changes within the next 18 mos?	No	No	No	No
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 (gaseous)	Daily	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	11/25/08	11/25/08	11/25/08	11/25/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A

Fremont Monitor Information

Pollutant	PM10**	FRM PM2.5*
Monitoring Objective	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood
Sampling method	Andersen HiVol 1200	*Partisol-Plus 2025 w/VSCC
PM filter analysis method	Weighed by Air District	Weighed by Air District
Start date	03/23/89	01/03/99
Operation schedule	1 in 6	Apr-Sep: 1 in 6 Oct-Mar: 1 in 3
Sampling season	All year**	All year
Probe height (AGL)	6.2 m	6.4 m
Probe height above roof	2.2 m	2.4 m
Distance from obstructions on roof	None	None
Distance from obstructions not on roof	None	None
Distance from tree (DL)	28.8 m	26.8 m
Distance to furnace or incinerator flue	7.0 m	4.9 m
Distance between collocated monitors	N/A	N/A
Distance between PM10 and PM2.5 monitors	4.6 m	4.6 m
Unrestricted airflow	360°	360°
Probe material	N/A	N/A
Residence time	N/A	N/A
Will there be changes within the next 18 mos?	N/A	No
Is it suitable for comparison against the annual PM2.5?	N/A	Yes
Frequency of flow rate verification for manual PM samplers	Weekly	Monthly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check (gaseous)	N/A	N/A
Last Annual Performance Evaluation (gaseous)	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	03/06/08 05/28/08	05/28/08 12/09/08

* Partisol-Plus 2025 replaced Andersen RAAS300 on 12/01/2008.
** PM10 discontinued on 06/30/2008.

Gilroy

Gilroy was originally chosen as an air monitoring site to measure ozone transport out of the southern part of the Air District. Prevailing northwesterly afternoon winds carry ozone and ozone precursors from the San Jose area southward down the Santa Clara Valley. When temperatures are hot, and solar radiation is strong, these precursors react and can form high concentrations of ozone many miles downwind of the urban core. The area near Gilroy is at the right distance downwind to experience these high concentrations.

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 2007, because of interest by local residents, a $PM_{2.5}$ monitor was added at the site. The monitor is intended to be a permanent addition. When the Gilroy site began in 1980, the population was small, and the monitoring objective was regional transport of ozone. As Gilroy's population has grown considerably, now having a 2008 population of 51,508, the site is now considered to be a population oriented monitoring site for both ozone and $PM_{2.5}$ as well.

In the most recent 3 years, the revised national 8-hour ozone standard of 75 ppb was exceeded six times at this site. $PM_{2.5}$ monitoring began on March 1, 2007 and during the 22 months of measurement this site has not recorded any exceedances of the national 24-hour $PM_{2.5}$ standard.

Gilroy Site Information

Site Name	Gilroy - 7015
AQS ID	06-085-0002
GIS coordinates	Latitude: 36.9993° N, Longitude: 121.5749° W
Location	Air monitoring shelter next to water pump station
Address	9P^{thP} and Princevalle St, Gilroy CA 95020
County	Santa Clara
Distance to road from gaseous probe	Princevalle St: 18.3 meters 9P^{thP} St: 15.7 meters 10th St. 185.0 meters
Traffic count	Princevalle St: 5,000 ADT (2008) 9P^{thP} St: 1,400 ADT (2008 estimate) 10th St. 12,700 ADT (2008)
Groundcover	paved
Representative Area	San Jose-Sunnyvale-Santa Clara MSA

Gilroy Monitor Information

Pollutant	**O_3**	**FRM PM2.5***
Monitoring Objective	Regional Transport, Highest Concentration, Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood
Sampling method	TECO 49C	*Partisol-Plus 2025 w/VSCC
PM filter analysis method	N/A	Weighed by Air District
Data Start date	07/01/80	03/01/07
Operation schedule	Continuous	Apr-Sep: 1 in 3 Oct-Mar: 1 in 3
Sampling season	Apr 1 – Nov 30	all year
Probe height (AGL)	4.7 m	2.7 m
Probe height above roof	2.6 m	N/A
Distance from obstructions on roof	None	N/A
Distance from obstructions not on roof	None	1.8 m
Distance from tree (DL)	26 m	26 m
Distance to furnace or incinerator flue	14.3 m	14.3 m
Distance between collocated monitors	N/A	N/A
Unrestricted airflow	360º	360º
Probe material	Teflon	N/A
Residence time	13 s	N/A
Will there be changes within the next 18 mos?	No	No
Is it suitable for comparison against the annual PM2.5?	N/A	Yes
Frequency of flow rate verification for manual PM samplers	N/A	Monthly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check (gaseous)	Daily	N/A
Last Annual Performance Evaluation (gaseous)	11/12/08	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	12/01/08 04/10/08

* Partisol-Plus 2025 replaced Andersen RAAS300 on 12/01/2008.
** PM10 discontinued on 06/30/2008.

Hayward

The Hayward air monitoring site was chosen to measure ozone at a higher elevation. Located on the east side of Hayward at an elevation of 951 feet, it is the highest air monitoring site in the Air District. Studies had shown that on high ozone days, a cloud of ozone and 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 Bay, i.e. in San Leandro and Fremont, this site was chosen between them, but at a higher elevation. Thus, the site gives an indication of ozone levels aloft. 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. The scale of this site is considered to be regional because it is representative of ozone levels aloft.

During the most recent 3 years, the revised national 8-hour ozone standard of 75 ppb was exceeded once at this site.

Hayward Site Information

Site Name	Hayward - 1015
AQS ID	06-001-2001
GIS coordinates	Latitude: 37.6544° N, Longitude: 122.0317° W
Location	Pump house near water tank
Address	3466 La Mesa Drive, Hayward CA 94542
County	Alameda
Distance to road from gaseous probe	Hayward Drive: 26.2 meters La Mesa Dr: 38 meters
Traffic count	Hayward Drive: 4,400 ADT (2007) La Mesa Dr: 500 ADT (estimate)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Hayward Monitor Information

Pollutant	**O3**
Monitoring Objective	Population oriented & Regional Transport
Spatial scale	Regional
Sampling method	TECO 49C
PM filter analysis method	N/A
Start date	05/31/77
Operation schedule	Continuous
Sampling season	April 1-November 30
Probe height (AGL)	6.7 m
Probe height above roof	3.1 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	11.4 m
Distance to furnace or incinerator flue	N/A
Distance between collocated monitors	N/A
Unrestricted airflow	360°
Probe material	Teflon
Residence time	13 s
Will there be changes within the next 18 months?	No
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 (gaseous)	Daily
Last Annual Performance Evaluation (gaseous)	11/17/08
Last two semi-annual flow rate audits for PM monitors	N/A

Livermore

Livermore was chosen for an air monitoring site because it is the largest city in eastern Alameda County, with a 2008 population estimate of 84,409, and because measurements have shown this area often has 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. Air flow analyses on high ozone days have shown ozone precursors to move into this valley from the region surrounding the San Francisco Bay through the Hayward and Niles Canyon Gaps to the west, and from the San Ramon Valley to the north. The air monitoring site is situated west of the city center, in a residential neighborhood. The station is located 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. Ozone and its precursors, CH_4/NMOC and NO/NO_2, are measured because the area is downwind of large sources of ozone precursors. Although traffic levels near the station are low, carbon monoxide is measured because the city has significant traffic, and Interstate 580 is only 0.87 miles to the north of the site. $PM_{2.5}$ is measured because light winds combined with surface-based inversions within the valley during the winter months cause elevated particulate levels.

PM_{10} has been monitored at Livermore since 2000. There has never been an exceedance of the national 24-hour PM_{10} standard recorded at this site, and the highest concentration recorded in the last seven years was less than half of the standard. The Air District discontinued PM_{10} monitoring at the site on June 30, 2008 because no exceedances of the national PM_{10} standard are expected to occur based on monitoring history, and because analyses have shown that PM_{10} levels can be estimated by multiplying the $PM_{2.5}$ measurements at the site by a factor of 1.5.

During the most recent 3 years, this site recorded 18 exceedances of the new 75 ppb national 8-hour ozone standard, and five exceedances of the California 24-hour PM_{10} standard. The revised national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ was exceeded on eight days.

Livermore Site Information

Site Name	Livermore – 1023
AQS ID	06-001-0007
GIS coordinates	Latitude: 37.6875° N, Longitude: 121.7842° W
Location	One story commercial building
Address	793 Rincon Avenue, Livermore CA 94551
County	Alameda
Distance to road from gaseous probe	Rincon Ave: 67 meters Pine St: 94 meters Interstate 580: 1,400 meters
Traffic count	Rincon Ave: 2,400 ADT (2005) Pine St: 4,800 ADT (2005) Interstate 580 at Portola Ave: 176,000 ADT (2007)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Livermore Monitor Information

Pollutant	O3	CO	NO/NO2	CH4/NMOC
Monitoring Objective	Population oriented & Highest Conc.	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	TECO 49i	TECO 48A	TECO 42C	TECO 55C
PM filter analysis method	N/A	N/A	N/A	N/A
Data Start date	01/01/00	12/31/99	NO2:12/31/99 NO: 01/01/00	CH4: 12/31/99 NMOC: 04/20/05
Operation schedule	Continuous	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year	All year
Probe height (AGL)	6.1 m	6.1 m	6.1 m	6.1 m
Probe height above roof	3.3 m	3.3 m	3.3 m	3.3 m
Distance from obstructions on roof	None	None	None	None
Distance from obstructions not on roof	None	None	None	None
Distance from tree (DL)	51 m	51 m	51 m	51 m
Distance to furnace or incinerator flue	16 m	16 m	16 m	16 m
Distance between collocated monitors	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	Teflon
Residence time	10 s	10 s	10 s	10 s
Will there be changes within the next 18 months?	No	No	No	No
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 (gaseous)	Daily	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	07/29/08	07/29/08	07/29/08	07/29/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A

Livermore Monitor Information

Pollutant	PM10**	FRM PM2.5	SASS PM2.5	Continuous PM2.5 (BAM)
Monitoring Objective	Population oriented	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	Andersen HiVol 1200	*Partisol-Plus 2025 w/VSCC	Met One SASS	Met One BAM 1020
PM filter analysis method	Weighed by Air District	Weighed by Air District	Weighed by DRI	N/A
Data Start date	12/08/99	12/02/99	06/11/08	07/01/00
Operation schedule	1 in 6	Jan-Mar 1 in 3 Apr-Sep: 1in 6 Oct-Dec: daily	1 in 3	Continuous
Sampling season	All year**	All year	All year	All year
Probe height (AGL)	5.1 m	5.4 m	5.1 m	5.1 m
Probe height above roof	2.0 m	2.3 m	2.0 m	2.0 m
Distance from obstructions on roof	None	None	None	None
Dist from obstructions not on roof	None	None	None	None
Dist from tree (DL)	55 m	53 m	55 m	52 m
Distance to furnace or incinerator flue	17 m	16 m	17 m	21 m
Distance between collocated monitors	N/A	N/A	N/A	N/A
Distance between PM10 and PM2.5 monitors	PM10 to PM2.5: 2.7 m PM10 to BAM: 3.5 m	PM2.5 to PM10: 2.7 m PM2.5 to SASS: 2.7 m PM2.5 to BAM: 5.2 m	SASS to BAM: 3.5 m SASS to PM2.5: 2.7 m	BAM to PM10: 3.5 m BAM to PM2.5: 5.2 m BAM to SASS: 3.5 m
Unrestricted airflow	360°	360°	360°	360°
Probe material	N/A	N/A	N/A	N/A
Residence time	N/A	N/A	N/A	N/A
Will there be changes w/in the next 18 mos?	N/A	No	No	No
Is it suitable for comparison against the annual PM2.5?	N/A	Yes	Yes	No – not reference or equivalent method
Frequency of flow rate verification for manual PM samplers	Weekly	Monthly	Monthly	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 (gaseous)	N/A	N/A	N/A	N/A
Last Annual Perform. Evaluation (gaseous)	N/A	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	4/23/08 7/28/08	4/23/08 12/3/08	7/28/08 10/08/08	4/23/08 10/2/08

* Partisol-Plus 2025 replaced Andersen RAAS300 on 11/18/2008.
** PM10 discontinued on 06/30/2008.

Los Gatos

Los Gatos was chosen for an ozone monitoring site because prevailing northerly winds transport ozone and ozone precursors from the densely populated area around the South Bay down the west side of the Santa Clara Valley. Mobile sampling studies as well as long-term monitoring in the Saratoga and Los Gatos areas showed Los Gatos to have the highest ozone levels in the area. These 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 an estimated 2008 population of 30,497.

In the most recent 3 years, this site recorded 11 exceedances of the new national 75 ppb 8-hour ozone standard.

Los Gatos Site Information

Site Name	Los Gatos - 7006
AQS ID	06-085-1001
GIS coordinates	Latitude: 37.2267° N, Longitude: 121.9796° W
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	University Ave: 37.2 meters Bentley Ave: 26.5 meters State Route 17: 291 meters
Traffic count	University Ave: 13,600 ADT (2005) Bentley Ave: 400 ADT (estimate) State Route 17: 67,000 ADT (2007)
Groundcover	Paved
Representative Area	San Jose- Sunnyvale- Redwood City MSA

Los Gatos Monitor Information

Pollutant	**O3**
Monitoring Objective	Population oriented & Highest concentration
Spatial scale	Neighborhood
Sampling method	TECO 49i
PM filter analysis method	N/A
Data Start date	04/01/72
Operation schedule	Continuous
Sampling season	All year
Probe height (AGL)	11.0 m
Probe height above roof	3.2 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	15.5 m
Distance to furnace or incinerator flue	4.3 m
Distance between collocated monitors	N/A
Unrestricted airflow	360º
Probe material	Teflon
Residence time	11 s
Will there be changes within the next 18 mos?	No
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 (gaseous)	Daily
Last Annual Performance Evaluation (gaseous)	11/13/08
Last two semi-annual flow rate audits for PM monitors	N/A

Martinez

Martinez was chosen for SO_2 source impact monitoring because the Shell Oil Refinery is located on the northern and eastern borders of the city. In addition, the Tesoro Refinery is 2.5 miles to the east. Although the prevailing winds in the area are from the west, east winds can transport SO_2 emissions from the refineries over populated areas within the city. The monitoring site is located near downtown Martinez and 0.5 miles from the Shell Refinery property. Martinez has a 2008 population of 36,348 with no industrial activities or SO_2 sources nearby other than the refineries. During the most recent 3 years, no exceedances of any SO_2 standards were recorded.

Martinez Site Information

Site Name	Martinez - 2014
AQS ID	06-013-2001
GIS coordinates	Latitude: 38.0128° N, Longitude: 122.1346° W
Location	Small sampling shelter next to fire station
Address	521 Jones St, Martinez CA 94553
County	Contra Costa
Distance to road from gaseous probe	Jones St: 22 meters Alhambra Ave: 19 meters
Traffic count	Jones St: 2,000 ADT est. (2008) Alhambra Ave: 9,800 ADT est. (2008)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Martinez Monitor Information

Pollutant	SO2
Monitoring Objective	Source Impact
Spatial scale	Neighborhood
Sampling method	TECO 43C
Analysis method	N/A
Start date	07/02/73
Operation schedule	Continuous
Sampling season	All year
Probe height (AGL)	7.2 m
Probe height above roof	2.7 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	11.2 m
Distance to furnace or incinerator flue	None
Unrestricted airflow	360°
Probe material	Teflon
Residence time	13 s
Will there be changes within the next 18 mos?	No
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 (gaseous)	Weekly
Last Annual Performance Evaluation (gaseous)	09/04/08
Last two semi-annual flow rate audits for PM monitors	N/A

Napa

Napa was chosen for an air monitoring location because it is the largest city in Napa County with a 2008 population estimate of 77,831. The city is located in the Napa Valley where local 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 into the valley. 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, NO, and NO_2 are measured because south winds carry ozone and its precursors into Napa. 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 home wood burning.

During the most recent 3 years, this site recorded two exceedances of the 75 ppb national 8-hour ozone standard and one exceedance of the California 24-hour PM_{10} standard. The continuous $PM_{2.5}$ (BAM) monitor at Napa has recorded measurements above the national 24-hour $PM_{2.5}$ standard on fourteen days since it began operating in January 2007. However, this monitor is not a recognized FRM or FEM method, and the data cannot be used to determine violations of the national $PM_{2.5}$ standards, or its attainment status. Only filter-based $PM_{2.5}$ measurements may be used for comparison with the national $PM_{2.5}$ standards.

Napa Site Information

Site Name	Napa – 4001
AQS ID	06-055-0003
GIS coordinates	Latitude: 38.3110° N, Longitude: 122.2962° W
Location	One story commercial building
Address	2552 Jefferson St, Napa CA 94558
County	Napa
Distance to road from gaseous probe	Jefferson St: 15 meters
Traffic count	Jefferson St: 19,143 ADT (2007)
Groundcover	Paved
Representative Area	Napa MSA

Napa Monitor Information

Pollutant	O3	CO	NO/NO2
Monitoring Objective	Population oriented	Population oriented	Population oriented
Spatial scale	Middle	Middle	Middle
Sampling method	TECO 49C	TECO 48	TECO 42C
PM filter analysis method	N/A	N/A	N/A
Start date	07/01/76	07/01/73	07/01/73
Operation schedule	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year
Probe height (AGL)	8.9 m	8.9 m	8.9 m
Probe height above roof	5.2 m	5.2 m	5.2 m
Distance from obstructions on roof	None	None	None
Distance from obstructions not on roof	None	None	None
Distance from tree (DL)	25 m	25 m	25 m
Distance to furnace or incinerator flue	5.7 m	5.7 m	5.7 m
Distance between collocated monitors	N/A	N/A	N/A
Distance between PM10 and PM2.5 monitors	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°
Probe material	Teflon	Teflon	Teflon
Residence time	8 s	8 s	9 s
Will there be changes within the next 18 mos?	No	No	No
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 (gaseous)	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	08/06/08	08/06/08	08/06/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A

Napa Monitor Information

Pollutant	PM10	PM10 Collocated	Continuous PM2.5 (BAM)
Monitoring Objective	Population oriented	Population oriented	Population oriented
Spatial scale	Middle	Middle	Middle
Sampling method	Tisch Env. HiVol TE-6000	Tisch Env. HiVol TE-6000	Met One BAM 1020
PM filter analysis method	Weighed by Air District	Weighed by Air District	N/A
Start date	11/04/86	06/08/04	01/04/07
Operation schedule	1 in 6	1 in 6	Continuous
Sampling season	All year	All year	All year
Probe height (AGL)	5.5 m	5.3 m	5.5 m
Probe height above roof	1.8 m	1.8 m	1.8 m
Distance from obstructions on roof	None	None	None
Distance from obstructions not on roof	None	None	None
Distance from tree (DL)	21 m	20.7 m	26 m
Distance to furnace or incinerator flue	5.0 m	3.4m	8.8 m
Distance between collocated monitors	3.4 m	3.4m	N/A
Distance between PM10 and PM2.5 monitors	6.1 m	8.8 m	Prim: 6.1 m Col: 8.8 m
Unrestricted airflow	360°	360°	360°
Probe material	N/A	N/A	N/A
Residence time	N/A	N/A	N/A
Will there be changes within the next 18 mos?	No	No	No
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	No – not reference or equivalent method
Frequency of flow rate verification for manual PM samplers	Weekly	Weekly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-Weekly
Frequency of one-point QC check (gaseous)	N/A	N/A	N/A
Last Annual Performance Evaluation (gaseous)	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	11/03/08 05/05/08	11/03/08 05/05/08	11/03/08 05/05/08

Oakland

The Air District opened a new air monitoring station in Oakland in November 2007, replacing a partial station in downtown Oakland that had been operating for 25 years. The partial station measured ozone and carbon monoxide, the only pollutants for which the Bay Area was not meeting the national standards during most of that period. After EPA created a standard for $PM_{2.5}$, and the Air District expanded its toxics monitoring program, it was decided that a larger station was needed to allow additional monitoring.

Oakland is an important area for air pollution monitoring because it is the largest city in Alameda County, with a 2007 population estimate of 420,183. 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 particulates and organic toxic compounds.

The monitoring site is located 7 miles southeast of downtown Oakland, on a commercial strip in a residential area. Ozone and 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; see the section under Oakland $PM_{2.5}$ SPM for further details.

No exceedances of either the national ozone or the national carbon monoxide standards were measured during the 25 years of operation at the old Oakland station. At the new station, no exceedances of any air quality standards for gaseous pollutants have been measured since operations began in November 2007.

Oakland Site Information

Site Name	Oakland - 1025
AQS ID	06-001-0009
GIS coordinates	Latitude: 37.7431 ° N, Longitude: 122.1699° W
Location	Two-story commercial building
Address	9925 International Blvd, Oakland CA 94603
County	Alameda
Distance to road from $PM_{2.5}$ inlet	International Blvd: 19 meters 99^{th} St: 23 meters 98^{th} St: 43 meters
Traffic count	International Blvd: 26,912 ADT (2006) 99^{th} St: 100 ADT (Estimate) 98^{th} St: 31,340 ADT (2002)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Oakland Monitor Information*

Pollutant	O3	CO	NO/NO2
Monitoring Objective	Population oriented	Population oriented	Population oriented
Spatial scale	Middle	Middle	Middle
Sampling method	TECO 49i	TECO 42C	API 300E
Analysis method	N/A	N/A	N/A
Start date	11/01/07	11/01/07	11/01/07
Operation schedule	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year
Probe height (AGL)	10 m	10 m	10 m
Probe height above roof	4 m	4 m	4 m
Distance from obstructions on roof	None	None	None
Distance from obstructions not on roof	None	None	None
Distance from tree (DL)	21 m	21 m	21 m
Distance to furnace or incinerator flue	N/A	N/A	N/A
Distance between collocated monitors	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°
Probe material	Teflon	Teflon	Teflon
Residence time	11 s	12 s	13 s
Will there be changes within the next 18 mos?	No	No	No
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 (gaseous)	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	11/19/08	11/19/08	11/19/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A

* The Oakland $PM_{2.5}$ monitor is detailed later in the SPM section of this report.

Pittsburg

Pittsburg was chosen for an air monitoring site because the city and adjacent area have a large population, and it is downwind of three refineries and three power plants. It was originally selected in 1968 to be representative of air quality levels in the northeast corner of the Air District. More recently, air monitoring sites in Concord, Bethel Island, and Fairfield fill that role. Consequently, the Pittsburg air monitoring station was closed at the end of 2008. New construction in the area and a large increase in the lease cost made this closure necessary.

The city of Pittsburg has a 2008 population estimate of 63,771 and the adjacent city of Antioch to the east has a population of 100,957. Pittsburg-Antioch is located in the Carquinez Strait Region, the only sea-level gap between San Francisco Bay and the Central Valley of California. During the warmer months of the year, the sea breeze often moves through this gap, carrying ozone and its precursors into the Central Valley. A reverse flow can also occur in the winter which transports particulates from the Central Valley into the San Francisco Bay Area.

The air monitoring site was located northwest of the city center, about a mile south of the Suisun Bay, in what was formerly an industrial area. Over the years, the area became residential on the south side of Tenth Street but remained industrial on the north side. Ozone and NO_2 were measured because the area was downwind of both the central San Francisco Bay Area and the Central Valley, which were sources of ozone precursors. Additionally, local power plants can be large sources of NO, which is converted to NO_2 in the atmosphere. Carbon monoxide was measured because the site was near Highway 4 with a high traffic volume. SO_2 was measured because there can be significant sources of SO_2 from three refineries and ships upwind of Pittsburg. PM_{10} was measured because the power plants were a significant source of particulates when they burned oil. Now that the power plants are fuel by natural gas, particulate emissions are low.

PM_{10} has been monitored at Pittsburg since 1999. There has never been an exceedance of the national 24-hour PM_{10} standard recorded at Pittsburg. Since 2002, concentrations have been less than half of the 24-hour national standard. The Air District discontinued PM_{10} monitoring at the site on June 30, 2008 because no exceedances of the national PM_{10} standard were expected to occur the rest of 2008 based on monitoring history, and the site was to be closed at the end of the year.

During the most recent 3 years, this site recorded seven exceedances of the 75 ppb national 8-hour ozone standard. No exceedances of any SO_2 standards were measured in the most recent 3 years.

Pittsburg Site Information

Site Name	Pittsburg – 2010
AQS ID	06-013-3001
GIS coordinates	Latitude: 38.0293° N, Longitude: 121.8969° W
Location	One story building
Address	583 West Tenth Street, Pittsburg CA 94565
County	Contra Costa
Distance to road from gaseous probe	West Tenth Street: 10.6 meters Highway 4: 1,075 meters
Traffic count	West Tenth Street: 9,600 ADT (2006) Highway 4: 135,717 ADT (2006) Railroad Avenue: 5,790 ADT (2006)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Pittsburg Monitor Information

Pollutant	O3	CO	NO/NO2	SO2	PM10*
Monitoring Objective	Population oriented	Population oriented	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Urban	Middle
Sampling method	TECO 49C	TECO 48A	TECO 42C	TECO 43C	Andersen GUV-16HBLA
PM filter analysis method	N/A	N/A	N/A	N/A	Weighed by Air District
Start date	06/01/76	12/03/68	12/03/68	01/18/72	08/04/99
Operation schedule	Continuous	Continuous	Continuous	Continuous	1 in 6
Sampling season	All year	All year	All year	All year	All year*
Probe height (AGL)	8.8 m	8.8 m	8.8 m	8.8 m	5.6 m
Probe height above roof	4.9 m	4.9 m	4.9 m	4.9 m	1.6 m
Distance from obstructions on roof	None	None	None	None	None
Distance from obstructions not on roof	None	None	None	None	None
Distance from tree (DL)	>50 m	>50 m	>50 m	>50 m	>50 m
Distance to furnace or incinerator flue	5 m	5 m	5 m	5 m	5.7 m
Distance between collocated monitors	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	Teflon	N/A
Residence time	7 s	7 s	9 s	8 s	N/A
Will there be changes within the next 18 mos?	Yes	Yes	Yes	Yes	N/A
Is it suitable for comparison against the annual PM2.5?	N/A	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	Weekly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	N/A
Frequency of one-point QC check (gaseous)	Daily	Daily	Daily	Daily	N/A
Last Annual Performance Evaluation (gaseous)	12/18/08	12/18/08	12/18/08	12/18/08	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A	07/17/08 04/22/08

* PM10 discontinued on 06/30/2008.

Point Reyes

Point Reyes was chosen for an air monitoring site because it is representative of background $PM_{2.5}$ levels. Air pollution levels at this site are usually low due to the rural nature of the area, and because the upwind air flow is generally from the Pacific Ocean 2.5 miles to the west. The site is located within the Point Reyes National Seashore. Within the park are scattered dairy farms. There are no industrial sources within 20 miles of the park. Between the ocean and the air monitoring site the land is relatively flat with low vegetation. The air monitoring site is located behind a ranger residence at the north end of the park. The closest towns are Marshall, 3 miles to the northeast with a population of a few hundred; and Inverness 3.5 miles to the southeast with a 2005 population estimate of 1,500.

This site recorded two exceedances of the national 24-hour $PM_{2.5}$ standard in the most recent 3 years. However, a continuous, beta attenuation monitor (BAM) is used to measure $PM_{2.5}$, and only filter-based $PM_{2.5}$ measurements may be used for comparison with the national $PM_{2.5}$ standards. BAM $PM_{2.5}$ data can not be used to determine violations of the national $PM_{2.5}$ standards, or its attainment status. This site is operated by the California Air Resources Board.

Pt Reyes Site Information

Site Name	Pt Reyes
AQS ID	06-041-0003
Monitor Classification	SLAMS
GIS coordinates	Latitude: 38.1269° N, Longitude: 122.9138° W
Location	At ground level behind a ranger residence
Address	170 Pierce Point Rd, Pt Reyes CA 94956
County	Marin
Distance to road from probe	Pierce Point Rd: 75 meters
Traffic count	Pierce Point Rd: 223 ADT (2006)
Groundcover	Grass
Representative Area	San Francisco-Oakland-Fremont MSA

Point Reyes Monitor Information

Pollutant	Continuous PM2.5 (BAM)
Monitoring Objective	General Background
Spatial scale	Regional
Sampling method	Met One BAM 1020
PM filter analysis method	N/A
Start date	12/01/00
Operation schedule	Continuous
Sampling season	All year
Probe height (AGL)	3.0 m
Probe height above ground	3.0 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	35 m
Distance to furnace or incinerator flue	>50 m
Distance between collocated monitors	N/A
Unrestricted airflow	360°
Probe material	N/A
Residence time	N/A
Will there be changes within the next 18 mos?	No
Is it suitable for comparison against the annual PM2.5?	No – not reference or equivalent method
Frequency of flow rate verification for manual PM samplers	N/A
Frequency of flow rate verification for automated PM analyzers	2 times per month
Frequency of one-point QC check (gaseous)	N/A
Last Annual Performance Evaluation (gaseous)	N/A
Last two semi-annual flow rate audits for PM monitors	09/09/08 09/17/07

Point Richmond

Point Richmond was chosen for H_2S source impact monitoring because the Chevron Refinery is on the northern boundary of this part of Richmond. Although prevailing winds in the area are from the south-southwest, occasional northerly winds will transport H_2S emissions from the refinery over the town. The town of Point Richmond, which is actually a neighborhood of the city of Richmond, has an estimated population of 1,300 as of the 2000 Census. The monitoring site is located in downtown Point Richmond, 0.2 miles south of the Chevron Refinery boundary. The site recorded 1 exceedance of the California 1-hour H_2S standard in the most recent 3 years.

Point Richmond Site Information

Site Name	Point Richmond - 2013
AQS ID	06-013-0005
GIS coordinates	Latitude: 37.9261° N, Longitude: 122.3856° W
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	W. Richmond Ave: 10.2 meters Interstate 580: 266 meters
Traffic count	W. Richmond Ave: 1,340 ADT (2003) Interstate 580: 56,000 ADT (2007)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont (MSA)

Point Richmond Monitor Information

Pollutant	H2S
Monitoring Objective	Source impact
Spatial scale	Neighborhood
Sampling method	TECO 45C
PM filter analysis method	N/A
Data Start date	01/01/99
Operation schedule	Continuous
Sampling season	All year
Probe height (AGL)	3.4 m
Probe height above roof	0.9 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	17 m
Distance to furnace or incinerator flue	7.3 m
Distance between collocated monitors	N/A
Unrestricted airflow	360º
Probe material	Teflon
Residence time	5 s
Will there be changes within the next 18 mos?	No
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 (gaseous)	Weekly
Last Annual Performance Evaluation (gaseous)	10/02/08
Last two semi-annual flow rate audits for PM monitors	N/A

Redwood City

Redwood City was chosen for an air monitoring site because it is one of the largest cities in San Mateo County, with a 2008 population estimate of 77,819. Being approximately midway between San Francisco and San Jose it is well positioned to monitor the progression of ozone precursors and ozone moving southward down the peninsula as they are channeled by the Santa Cruz Mountains. 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, occasionally light wind conditions cause high levels of ozone precursors, ozone, or particulate to 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. Ozone and NO_2 are collected because the area is a large source of ozone and ozone precursor emissions. Carbon monoxide is monitored because of the high volume of traffic in the area, and US Highway 101 is only 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.

PM_{10} has been monitored at Redwood City since 1988. There has never been an exceedance of the national 24-hour PM_{10} standard recorded at Redwood City, and the highest concentration recorded in the last eight years was about half (52%) of the standard. The Air District discontinued PM_{10} monitoring at the site on June 30, 2008 because no exceedances of the national PM_{10} standard are expected to occur based on monitoring history, and because analyses have shown that PM_{10} levels can be estimated by multiplying the $PM_{2.5}$ measurements at the site by a factor of 1.5.

During the most recent 3 years, this site recorded no exceedances of any ozone standards. The revised national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ was exceeded on two days.

Redwood City Site Information

Site Name	Redwood City - 6004
AQS ID	06-081-1001
GIS coordinates	Latitude: 37.4830° N, Longitude: 122.2036° W
Location	One-story commercial building
Address	897 Barron Ave, Redwood City CA 94063
County	San Mateo
Distance to road from gaseous probe	Barron Ave: 13 meters Bay Road: 24 meters Washington Ave: 131 meters US Highway 101: 455 meters
Traffic count	Barron Ave: 1,200 ADT (2009) Bay Road: 8350 ADT (2008) Washington Ave: 1140 ADT (2008) US Highway 101: 202,000 ADT (2007)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Redwood City Monitor Information

Pollutant	**O3**	**CO**	**NO/NO2**
Monitoring Objective	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Sampling method	TECO 49i	TECO 48A	TECO 42C
PM filter analysis method	N/A	N/A	N/A
Data Start date	07/01//76	03/01/67	03/01/67
Operation schedule	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year
Probe height (AGL)	6.8 m	6.8 m	6.8 m
Probe height above roof	3.6 m	3.6 m	3.6 m
Distance from obstructions on roof	None	None	None
Distance from obstructions not on roof	None	None	None
Distance from tree (DL)	46 m	46 m	46 m
Distance to furnace or incinerator flue	12.7 m	12.7 m	12.7 m
Distance between collocated monitors	N/A	N/A	N/A
Unrestricted airflow	360º	360º	360º
Probe material	Teflon	Teflon	Teflon
Residence time	11 s	12 s	13 s
Will there be changes within the next 18 mos?	No	No	No
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 (gaseous)	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	08/21/08	08/21/08	08/21/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A

Redwood City Monitor Information

Pollutant	PM10**	PM10** Collocated	FRM PM2.5*	Cont PM2.5 (BAM)
Monitoring Objective	Population oriented	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	Andersen HiVol 1200		*Partisol-Plus 2025 w/VSCC	Met One Model 1020
PM filter analysis method	Weighed by Air District	Weighed by Air District	Weighed by Air District	N/A
Data Start date	08/01/88	07/14/04	02/26/99	01/01/04
Operation schedule	1 in 6	1 in 6	Apr-Sep: 1in 6 Oct-Mar:1in 3	Continuous
Sampling season	All year**	All year**	all year	All year
Probe height (AGL)	5.4 m	4.8 m	5.3 m	5.5 m
Probe height above roof	1.9 m	1.6 m	2.2	2.2 m
Distance from obstructions on roof	None		None	None
Dist from obstructions not on roof	None	None	None	None
Distance from tree (DL)	44 m	42 m	44m	47 m
Distance to furnace or incinerator flue	13.6 m	11.3 m	14.0	13.6 m
Distance between collocated monitors	4.7 m	4.7 m	N/A	N/A
Distance between PM10 and PM2.5 samplers	PM10 to PM2.5: 3.0 m PM10 to BAM: 2.9 m	PM10 to PM2.5: 2.1 m PM10 to BAM: 4.3 m	PM2.5 to PM10: 3.0 m PM2.5 to BAM : 2.8 m	BAM to PM10: 2.9 m BAM to PM2.5: 2.8 m
Unrestricted airflow	360º	360º	360º	360º
Probe material	N/A	N/A	N/A	N/A
Residence time	N/A	N/A	N/A	N/A
Will there be changes within the next 18 mos?	N/A	N/A	Yes	No
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	Yes	No – not reference or equiv method
Frequency of flow rate verification for manual PM samplers	Weekly		Monthly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	Bi-Weekly
Frequency of 1-pt QC check (gaseous)	N/A	N/A	N/A	N/A
Last Annual Perform. Evaluation (gaseous)	N/A	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	7/22/08 5/22/08	7/22/08 5/22/08	12/04/08 5/22/08	12/10/08 5/22/08

* Partisol-Plus 2025 replaced Andersen RAAS300 on 12/01/2008.
** PM10 discontinued on 06/30/2008.

Richmond 7th

Richmond 7th was chosen for H_2S and SO_2 source impact monitoring because it is near the eastern boundary of the Chevron Refinery. 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. The site is located 0.5 miles east of the refinery boundary, where the monitor is expected to measure the highest concentrations in an area where the public has access.

This site recorded no exceedances of the California 1-hour H_2S standard, and no exceedances of any SO_2 standard in the most recent 3 years.

Richmond 7th Site Information

Site Name	Richmond 7th - 2019
AQS ID	06-013-0006
GIS coordinates	Latitude: 37.94812° N, Longitude: 122.36479° W
Location	Fire station
Address	1065 7th Street, Richmond CA 94801
County	Contra Costa
Distance to road from gaseous probe	7th St: 21.5 meters Hensley St: 29.9 meters Richmond Parkway: 200 meters
Traffic count	7th St: 3,125 ADT (2007) Hensley St: 2,125 ADT (2007) Richmond Parkway: 35,650 (2007)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Richmond 7th Monitor Information

Pollutant	SO2	H2S
Monitoring Objective	Source impact	Source impact
Spatial scale	Neighborhood	Neighborhood
Sampling method	TECO 43C	TECO 45C
PM filter analysis method	N/A	N/A
Start date	07/01/80	10/01/99
Operation schedule	Continuous	Continuous
Sampling season	All year	All year
Probe height (AGL)	8.4 m	8.4 m
Probe height above roof	2.8 m	2.8 m
Distance from obstructions on roof	None	None
Distance from obstructions not on roof	None	None
Distance from tree (DL)	10 m	10 m
Distance to furnace or incinerator flue	12.2 m	12.2 m
Distance between collocated monitors	N/A	N/A
Unrestricted airflow	360°	360°
Probe material	Teflon	Teflon
Residence time	13 s	15 s
Will there be changes within the next 18 mos?	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	N/A	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check (gaseous)	Weekly	Weekly
Last Annual Performance Evaluation (gaseous)	11/26/08	10/01/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A

Rodeo

Rodeo was chosen for H_2S source impact monitoring because the ConocoPhillips Refinery is on the eastern boundary of the town of Rodeo. 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 rapidly growing community of Rodeo had a population of 8,717 in 2000. The monitoring site is located in a residential area 0.6 miles southwest of the ConocoPhillips Refinery boundary.

No exceedances of the California H_2S standard were measured in the most recent 3 years.

Rodeo Site Information

Site Name	Rodeo - 2034
AQS ID	06-013-0007
GIS coordinates	Latitude: 38.03431º N, Longitude: 122.27039º W
Location	Single story storage area at fire station
Address	326 Third Street, Rodeo CA 94572
County	Contra Costa
Distance to road from gaseous probe	Third St: 13.3 meters Parker St: 249.0 meters
Traffic count	Third St: 500 ADT (estimate) Parker St: 7,316 ADT (2008)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont (MSA)

Rodeo Monitor Information

Pollutant	**H2S**
Monitoring Objective	Source impact
Spatial scale	Neighborhood
Sampling method	TECO 45C
PM filter analysis method	N/A
Start date	04/01/02
Operation schedule	Continuous
Sampling season	All year
Probe height (AGL)	6.7 m
Probe height above roof	2.0 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	>50 m
Distance to furnace or incinerator flue	10.9 m
Distance between collocated monitors	N/A
Unrestricted airflow	360°
Probe material	Teflon
Residence time	15 s
Will there be changes within the next 18 mos?	No
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers audit	N/A
Frequency of flow rate verification for automated PM analyzers	N/A
Frequency of one-point QC check (gaseous)	Weekly
Last Annual Performance Evaluation (gaseous)	09/04/08
Last two semi-annual flow rate audits for PM monitors	N/A

San Francisco

San Francisco was chosen for an air monitoring site because it is the second largest city in the San Francisco Bay Area, with a 2007 population estimate of 824,525. Although the sea breeze typically 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 a monitoring site because it is more 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 is measured because of the very high population density of the city. NO/NO_2 and $NMOC/CH_4$ are measured because this is a source area for these ozone precursors. Carbon monoxide is measured because of the high traffic volume. PM_{10} and $PM_{2.5}$ are measured because stagnant days combined with surface based-based inversions can cause elevated particulate levels, and because of the contribution of heavy vehicular traffic to PM levels.

SO_2 was originally measured in San Francisco because of potential emissions from nearby power plants, sewage treatment plants, and nearby ships. SO_2 monitoring was discontinued at the end of 2008 because there are no longer any major sources of SO_2 in the vicinity of San Francisco, and data from the most recent five years have not shown any elevated levels of ambient SO_2.

During the most recent 3 years, this site recorded five exceedances of the California 24-hour PM_{10} standard. The revised national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ was exceeded on eight days. No exceedances of any ozone or SO_2 standards were measured in the most recent 3 years.

San Francisco Site Information

Site Name	San Francisco – 5011
AQS ID	06-075-0005
GIS coordinates	Latitude: 37.7660° N, Longitude: 122.3992° W
Location	One-story commercial building
Address	10 Arkansas St, Suite N, San Francisco CA 94107
County	San Francisco
Distance to road from gaseous probe	16th St: 32.0 meters Arkansas St: 17.0 meters Interstate 280: 300 meters U.S. Highway 101: 504 meters
Traffic count	16th St: 12,278 ADT (2006) Arkansas St: 500 ADT (estimate) Interstate 280: 98,000 ADT (2007) U.S. Highway 101: 233,000 (2007)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

San Francisco Monitor Information

Pollutant	O3	CO	NO/NO2	SO2	CH4/NMOC
Monitoring Objective	Population oriented	Population oriented	Population oriented	Source impact	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	TECO 49C	TECO 48	TECO 42i	TECO 43C	TECO 55C
PM Filter Analysis method	N/A	N/A	N/A	N/A	N/A
Start date	01/01/86	01/01/86	NO: 01/01/87 NO2: 01/01/86	01/01/86	CH4: 01/01/94 NMOC: 07/12/06
Operation schedule	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year	All year	All year
Probe height (AGL)	10.5 m	10.5 m	10.5 m	10.5 m	10.5 m
Probe height above roof	4.4 m	4.4 m	4.4 m	4.4 m	4.4 m
Distance from obstructions on roof	None	None	None	None	None
Distance from obstructions not on roof	None	None	None	None	None
Distance from tree (DL)	15.3 m	15.3 m	15.3 m	15.3 m	15.3 m
Distance to furnace or incinerator flue	5.2 m	5.2 m	5.2 m	5.2 m	5.2 m
Distance between collocated monitors	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	Teflon	Teflon
Residence time	11 s	11 s	12 s	12 s	12 s
Will there be changes within the next 18 mos?	No	No	No	Yes	No
Is it suitable for comparison against the annual PM2.5?	N/A	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	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	N/A
Frequency of one-point QC check (gaseous)	Daily	Daily	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	11/05/08	11/05/08	11/05/08	11/05/08	11/05/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A	N/A

San Francisco Monitor Information

Pollutant	PM10	FRM PM2.5*	Continuous PM2.5 (BAM)
Monitoring Objective	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood
Sampling method	Andersen HiVol 1200	*Partisol-Plus 2025 w/VSCC	Met One BAM 1020
PM Filter Analysis method	Weighed by Air District	Weighed by Air District	N/A
Start date	11/16/86	01/01/1999	01/01/2004
Operation schedule	1 in 6	Apr-Sep: 1 in 6 Oct-Mar: 1 in 3	Continuous
Sampling season	All year	All year	All year
Probe height (AGL)	7.6 m	8.2 m	8.3 m
Probe height above roof	1.5 m	2 .0 m	2.2 m
Distance from obstructions on roof	None	None	None
Distance from obstructions not on roof	None	None	None
Distance from tree (DL)	17.5 m	16.5 m	13.8 m
Distance to furnace or incinerator flue	7.0 m	7.3 m	3.4 m
Distance between collocated monitors	N/A	N/A	N/A
Distance between PM10 and PM2.5 samplers	PM10 to PM2.5: 2.1 m PM10 to BAM: 3.8 m	PM2.5 to PM10: 2.1 m PM2.5 to BAM: 3.2 m	BAM to PM10: 3.8 m BAM to PM2.5: 3.2 m
Unrestricted airflow	360°	360°	360°
Probe material	N/A	N/A	N/A
Residence time	N/A	N/A	N/A
Will there be changes within the next 18 mos?	Yes	Yes	No
Is it suitable for comparison against the annual PM2.5?	N/A	Yes	No – not reference or equivalent method
Frequency of flow rate verification for manual PM samplers	Weekly	Monthly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	Bi-Weekly
Frequency of one-point QC check (gaseous)	N/A	N/A	N/A
Last Annual Performance Evaluation (gaseous)	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	11/04/08 05/13/08	12/18/08 05/13/08	11/04/08 05/13/08

* Partisol-Plus 2025 replaced Andersen RAAS300 on 12/01/2008.

San Jose

San Jose was chosen for an air monitoring site because it is the largest city in Santa Clara County as well as being the largest city in the Bay Area, with a 2008 population of 1,006,892. 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 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 completely encircled by major freeways, and has a large airport just to the northwest. 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, NMOC, CH_4 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.

In the most recent 3 years, this site recorded five exceedances of the new national 75 ppb 8-hour ozone standard, 21 exceedances of the revised national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$, and six exceedances of the California 24-hour PM_{10} standard.

San Jose Site Information

Site Name	San Jose – 7032
AQS ID	06-085-0005
GIS coordinates	Latitude: 37.3484° N, Longitude: 121.8949° W
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	Jackson St: 15.1 meters 4th St: 34.7 meters
Traffic count	Jackson St: 3,990 ADT (2007) 4th St: 6,000 ADT (2007)
Groundcover	Paved
Representative Area	San Jose-Sunnyvale-Santa Clara MSA

San Jose Monitor Information

Pollutant	O3	CO	NO/NO2	CH4/NMOC
Monitoring Objective	Population oriented	Population oriented & Highest concentration	Population oriented & Highest concentration	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	TECO 49i	TECO 48i TLE	TECO 42C	TECO 55C
PM filter analysis method	N/A	N/A	N/A	N/A
Data start date	11/01/02	11/01/02	11/01/02	CH4: 11/22/02 NMOC: 07/06/06
Operation schedule	Continuous	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year	All year
Probe height (AGL)	11.9 m	11.9 m	11.9 m	11.9 m
Probe height above roof	4.4 m	4.4 m	4.4 m	4.4 m
Distance from obstructions on roof	None	None	None	None
Distance from obstructions not on roof	None	None	None	None
Distance from tree (DL)	14.3	14.3	14.3	14.3
Distance to furnace or incinerator flue	4.6	4.6	4.6	4.6
Distance between collocated monitors	N/A	N/A	N/A	N/A
Unrestricted airflow	360º	360º	360º	360º
Probe material	Teflon	Teflon	Teflon	Teflon
Residence time	12 s	13 s	12 s	11 s
Will there be changes within the next 18 mos?	No	No	No	No
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 (gaseous)	Daily	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	10/16/08	10/16/08	10/16/08	10/16/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A

San Jose Monitor Information

Pollutant	PM10	FRM PM2.5*	SASS PM2.5	Continuous PM2.5 (BAM)
Monitoring Objective	Population oriented	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	Andersen HiVol 1200	*Partisol-Plus 2025 w/VSCC	Met One SASS	Met One Model 1020
PM filter analysis method	Weighed by Air District	Weighed by Air District	Weighed by RTI International	N/A
Data start date	10/15/02	10/05/02	10/05/02	01/01/04
Operation schedule	1 in 6	Apr-Sep: 1in 3 Oct-Mar: daily	1 in 3	Continuous
Sampling season	All year	All year	All year	All year
Probe height	8.3 m	9.0 m	8.9 m	9.8m
Probe height above roof	1.5 m	2.3 m	2.1 m	2.0 m
Distance from obstructions on roof	None	None	None	None
Dist from obstructions not on roof	None	None	None	None
Distance from tree (DL)	11.0 m	15.1 m	16 m	13.1 m
Distance to furnace or incinerator flue	1.5	3.3	2.4 m	3.4
Distance between collocated monitors	N/A	N/A	N/A	N/A
Distance between PM10 and PM2.5 samplers	PM10 to PM2.5:3.1m PM10 to SASS: 4.1m PM10 to BAM:3.5 m	PM2.5 to PM10: 3.1 m SASS to PM10: 4.1 m PM2.5 to BAM: 4.2 m	SASS to PM10: 4.1 m SASS to BAM: 7.9 m SASS to PM2.5: 4.1 m	BAM to PM10: 3.5 m BAM to PM2.5: 4.2 m BAM to SASS: 7.9 m
Unrestricted airflow	360º	360º	360º	360º
Probe material	N/A	N/A	N/A	N/A
Residence time	N/A	N/A	N/A	N/A
Will there be changes within the next 18 mos?	N/A	No	No	No
Is it suitable for comparison against the annual PM2.5?	N/A	Yes	Yes	No – not reference or equivalent method
Frequency of flow rate verification for manual PM samplers	Weekly	Monthly	Monthly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	Bi-Weekly
Frequency of 1-pt QC check (gaseous)	N/A	N/A	N/A	N/A
Last Annual Perform. Evaluation (gaseous)	N/A	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	10/14/08 04/16/08	12/03/08 04/16/08	07/21/08 10/14/08	10/14/08 04/16/08

* Partisol-Plus 2025 replaced Andersen RAAS300 on 11/18/2008.

San Leandro

San Leandro was chosen for an ozone air monitoring site because it is centered in the densely populated western part of Alameda County, and because it is downwind of a large source of ozone and ozone precursors from the central Bay Area. Studies have shown that ozone can be transported southward along the East Bay Hills to San Leandro, at concentrations that may exceed ozone standards. San Leandro has an estimated 2007 population of 81,851. The site was located in southeast San Leandro, close to the base of the East Bay Hills on the grounds of the Fairmont Hospital surrounded by a residential area. There are no significant industrial emissions in the immediate area, although the site is 0.28 miles from Interstate 580.

This site recorded one exceedance of the California 1-hour ozone standard in the most recent 3 years. The Air District closed the ozone monitor at San Leandro at the end of the 2008 ozone season (Nov 30, 2008) because the revised national 8-hour ozone standard of 75 ppb has not been exceeded for nine years at San Leandro, and because the new Oakland station, which opened in 2007, is close enough to San Leandro (the sites are 3 miles apart) to characterize the area. No other pollutants were measured at San Leandro, so the San Leandro station was closed.

San Leandro Site Information

Site Name	San Leandro - 1022
AQS ID	06-001-0006
GIS coordinates	Latitude: 37.7102° N, Longitude: 122.1169° W
Location	Trailer
Address	15400 Foothill Boulevard, San Leandro CA 94578
County	Alameda
Distance to road from gaseous probe	Foothill Blvd: 402 meters Fairmont Dr: 353 meters Interstate 580: 453 meters
Traffic count	Foothill Blvd: 4,720 ADT (2004) Fairmont Dr: 9,170 ADT (2006) Interstate 580: 151,000 ADT (2006)
Groundcover	Gravel
Representative Area	San Francisco-Oakland-Fremont MSA

San Leandro Monitor Information

Pollutant	O3
Monitoring Objective	Population oriented
Spatial scale	Neighborhood
Sampling method	TECO 49C
PM filter analysis method	N/A
Start date	08/01/90
Operation schedule	Continuous
Sampling season	April 1-November 30
Probe height (AGL)	4.8 m
Probe height above roof	1.9 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	13.2 m
Distance to furnace or incinerator flue	N/A
Distance between collocated monitors	N/A
Unrestricted airflow	360°
Probe material	Teflon
Residence time	13 s
Will there be changes within the next 18 mos?	Yes
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 (gaseous)	Daily
Last Annual Performance Evaluation (gaseous)	11/26/08
Last two semi-annual flow rate audits for PM monitors	N/A

San Martin

San Martin was chosen for an ozone air monitoring site 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. 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. The town has a small population of 4,230 (2000 Census) and no industrial sources. The air 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 3 years, this site recorded nine exceedances of the national 8-hour ozone standard.

San Martin Site Information

Site Name	San Martin - 7022
AQS ID	06-085-2006
GIS coordinates	Latitude: 37.0792° N, Longitude: 121.5999° W
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	Murphy Ave: 57.0 meters US Highway 101: 455 meters
Traffic count	Murphy Ave: 500 ADT (estimate) US Highway 101: 111,000 ADT (2007)
Groundcover	Vegetative
Representative Area	San Jose- Sunnyvale- Santa Clara MSA

San Martin Monitor Information

Pollutant	O3
Monitoring Objective	Highest concentration
Spatial scale	Neighborhood
Sampling method	TECO 49C
PM filter analysis method	N/A
Data Start date	04/30/94
Operation schedule	Continuous
Sampling season	Apr 1 – Nov 30
Probe height (AGL)	4.8 m
Probe height above roof	2.8 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	23 m
Distance to furnace or incinerator flue	N/A
Distance between collocated monitors	N/A
Unrestricted airflow	360º
Probe material	Teflon
Residence time	14 s
Will there be changes within the next 18 mos?	No
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 (gaseous)	Daily
Last Annual Performance Evaluation (gaseous)	11/12/08
Last two semi-annual flow rate audits for PM monitors	N/A

San Pablo

San Pablo was chosen for an air monitoring site because the area is the most populated portion of western Contra Costa County. San Pablo, with a 2007 population estimate of 31,190, is almost completely surrounded by the city of Richmond, with a 2007 population estimate of 103,577. This area has heavy industry, high traffic volume, including two major freeways, and it is very close to the Chevron Refinery. Ozone and 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 because 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_{10} is measured because stagnant days in the fall and winter can result in elevated particulate levels.

This site recorded four exceedances of the California 24-hour PM_{10} standard in the most recent 3 years. No exceedances of any ozone or SO_2 standards were measured in the most recent 3 years.

The station ceased operation due to heavy damage from a fire in the building in March 2009. It is expected to reopen in early 2010.

San Pablo Site Information

Site Name	San Pablo - 2035
AQS ID	06-013-1004
GIS coordinates	Latitude: 37.96041° N, Longitude: 122.35685° W
Location	One story commercial building
Address	1865-D Rumrill Blvd, San Pablo CA 94806
County	Contra Costa
Distance to road from gaseous probe	Rumrill Blvd: 15.8 meters
Traffic count	Rumrill Blvd: 25,106 ADT (2006)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

San Pablo Monitor Information

Pollutant	O3	CO	NO/NO2	SO2	PM10
Monitoring Objective	Population oriented	Population oriented	Population oriented	Source Impact	Population oriented
Spatial scale	Middle	Middle	Middle	Neighborhood	Middle
Sampling method	TECO 49i	API 300E	TECO 42i	TECO 43i	Tisch Env. HiVol TE-6000
PM filter analysis method	N/A	N/A	N/A	N/A	Weighed by Air District
Start date	09/13/02	09/13/02	09/13/02	09/13/02	09/23/02
Operation schedule	Continuous	Continuous	Continuous	Continuous	1 in 6
Sampling season	All year	All year	All year	All year	All year
Probe height (AGL)	9.0 m	9.0 m	9.0 m	9.0 m	6.4 m
Probe height above roof	5.6 m	5.6 m	5.6 m	5.6 m	2.2 m
Distance from obstructions on roof	None	None	None	None	None
Distance from obstructions not on roof	None	None	None	None	None
Distance from tree (DL)	>50 m	>50 m	>50 m	>50 m	>50 m
Distance to furnace or incinerator flue	None	None	None	None	None
Distance between collocated monitors	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	Teflon	N/A
Residence time	12 s	13 s	14 s	13 s	N/A
Will there be changes within the next 18 mos?	Yes	Yes	Yes	Yes	Yes
Is it suitable for comparison against the annual PM2.5?	N/A	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	Weekly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	N/A
Frequency of one-point QC check (gaseous)	Daily	Daily	Daily	Daily	N/A
Last Annual Performance Evaluation (gaseous)	08/26/08	08/26/08	08/26/08	08/26/08	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A	11/18/08 05/15/08

San Rafael

San Rafael was chosen for an air monitoring site because it is the largest city in Marin County with a 2008 population estimate of 58,363. The city's climate and air quality is representative of that found throughout the populous northeastern 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 commercial building about a block east of the 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_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_{10} is also collected because light winds combined with wood burning and surface based-based inversions during the winter months can cause elevated particulate concentrations.

During the most recent 3 years, this site recorded two exceedances of the California 24-hour PM_{10} standard.

San Rafael Site Information

Site Name	San Rafael - 3005
AQS ID	06-041-0001
GIS coordinates	Latitude: 37.9724° N, Longitude: 122.5200° W
Location	Second floor of two-story commercial building
Address	534 4th Street, San Rafael CA 94901
County	Marin
Distance to road from gaseous probe	4th St: 18 meters Irwin St: 48 meters US Highway 101: 112 meters
Traffic count	4th St: 6,000 ADT est. (2007) Irwin St: 18,360 ADT (2003) US Highway 101: 131,000 ADT (2006)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

San Rafael Monitor Information

Pollutant	O3	CO	NO/NO2	PM10
Monitoring Objective	Population oriented	Population oriented	Population oriented	Population oriented
Spatial scale	Middle	Middle	Middle	Middle
Sampling method	TECO 49i	TECO 48A	TECO 42C	Andersen HiVol 1200
Analysis method	N/A	N/A	N/A	Weighed by Air District
Start date	07/01/76	10/01/67	NO: 01/01/68 NO2:10/01/67	11/04/86
Operation schedule	Continuous	Continuous	Continuous	1 in 6
Sampling season	All year	All year	All year	All year
Probe height (AGL)	11.9 m	11.9 m	11.9 m	7.0 m
Probe height above roof	5.2 m	5.2 m	5.2 m	1.9 m
Distance from obstructions on roof	None	None	None	None
Distance from obstructions not on roof	21 m	21 m	21 m	20 m
Distance from tree (DL)	15 m	15 m	15 m	14 m
Distance to furnace or incinerator flue	3.5 m	3.5 m	3.5 m	2.3 m
Distance between collocated monitors	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	N/A
Residence time	10 s	10 s	11 s	N/A
Will there be changes within the next 18 mos?	No	No	No	Yes
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	Weekly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A
Frequency of one-point QC check (gaseous)	Daily	Daily	Daily	N/A
Last Annual Performance Evaluation (gaseous)	09/17/08	09/17/08	09/17/08	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	12/03/08 06/09/08

Santa Rosa

Santa Rosa was chosen for an air monitoring site because it is the largest city in Sonoma County with a 2008 population estimate of 161,496. The city's climate is strongly influenced by the Pacific Ocean and the marine air flow typically keeps pollution levels low. However, during light winds or overnight temperature inversions, local sources can cause elevated pollution levels. The monitoring site is located just east of the downtown urban core and 0.5 miles east of Highway 101. There are no industrial sources in the immediate area. Ozone and 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 Highway 101 transportation artery. FRM $PM_{2.5}$ is measured because light winds combined with wood burning, vehicular traffic, and surface based-based inversions during the winter months can cause elevated particulate concentrations.

PM_{10} has been monitored at Santa Rosa since 1994, and there has never been an exceedance of the national 24-hour PM_{10} standard recorded. 24-hour concentrations have been less than half the national standard since 1997, except for one day when 86 $\mu g/m^3$ was measured while road construction occurred near the site. The Air District discontinued PM_{10} monitoring at the site on June 30, 2008 because no exceedances of the national PM_{10} standard are expected to occur based on monitoring history, and because analyses have shown that PM_{10} levels can be estimated by multiplying the $PM_{2.5}$ measurements at the site by a factor of 1.5.

During the most recent 3 years, this site recorded no exceedances of the national or California ozone standards. The national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ was exceeded on one day in the last 3 years.

Santa Rosa Site Information

Site Name	Santa Rosa - 9004
AQS ID	06-097-0003
GIS coordinates	Latitude: 38.4435° N, Longitude: 122.7102° W
Location	Second floor of two-story commercial building
Address	837 5th St, Santa Rosa CA 95404
County	Sonoma
Distance to road from gaseous probe	5th St: 24 meters E St: 79 meters College Ave: 210 meters Brookwood Ave: 228 meters US Highway 101: 918 meters
Traffic count	5th St: 2,608 ADT (2004-2006) E St: 7,804 ADT (2004-2006) College Ave: 19,062 ADT (2004-2006) Brookwood Ave: 21,297 ADT (2004-2006) US Highway 101: 120,000 ADT (2006)
Groundcover	Paved
Representative Area	Santa Rosa-Petaluma MSA

Santa Rosa Monitor Information

Pollutant	O3	CO	NO/NO2	PM10**	FRM PM2.5*
Monitoring Objective	Population oriented	Population oriented	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	TECO 49i	TECO 48	TECO 42C	Andersen HiVol 1200	*Partisol-Plus 2025 w/VSCC
Analysis method	N/A	N/A	N/A	Weighed by Air District	Weighed by Air District
Start date	04/17/81	04/17/81	NO: 01/01/87 NO2:01/17/81	07/13/94	01/24/99
Operation schedule	Continuous	Continuous	Continuous	1 in 6	Apr-Sep: 1in 6 Oct-Mar: 1in 3
Sampling season	All year	All year	All year	All year*	All year
Probe height (AGL)	10.7 m	10.7 m	10.7 m	8.1 m	7.5 m
Probe height above roof	5.2 m	5.2 m	5.2 m	2.6 m	2.0 m
Distance from obstructions on roof	None	None	None	None	None
Distance from obstructions not on roof	21 m	21 m	21 m	21 m	21 m
Distance from tree (DL)	13.7 m	13.7 m	13.7 m	14.6 m	12.5 m
Distance to furnace or incinerator flue	4.7 m	4.7 m	4.7 m	5.7 m	4.9 m
Distance between collocated monitors	N/A	N/A	N/A	N/A	N/A
Distance between PM10 and PM2.5 monitors	N/A	N/A	N/A	3.0 m	3.0 m
Unrestricted airflow	360°	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	N/A	N/A
Residence time	7 s	8 s	9 s	N/A	N/A
Will there be changes within the next 18 mos?	No	No	No	N/A	No
Is it suitable for comparison against the annual PM2.5?	N/A	N/A	N/A	N/A	Yes
Frequency of flow rate verification for manual PM samplers	N/A	N/A	N/A	Weekly	Monthly
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	N/A
Frequency of one-point QC check (gaseous)	Daily	Daily	Daily	N/A	N/A
Last Annual Performance Evaluation (gaseous)	12/04/08	12/04/08	12/04/08	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	07/24/08 06/10/08	12/03/08 06/10/08

* Partisol-Plus 2025 replaced Andersen RAAS300 on 11/1/2008.
** PM10 discontinued on 06/30/2008.

Sunnyvale

Sunnyvale was chosen for an ozone monitoring site because it is located within the densely populated South Bay Area and is midway between monitoring sites at Redwood City and downtown San Jose. Sunnyvale has an estimated 2008 population of 138,826. Ozone measurements were made in the past at nearby Mountain View to determine if ozone was moving down the west side of the Santa Clara Valley, similar to what had been observed on the east side of the Santa Clara Valley. The Mountain View site had to be closed due to demolition of the structure containing the site, and it was desirable to continue measuring ozone in the area because ozone exceedances had been recorded at Mountain View. A suitable monitoring site was found close by in Sunnyvale, which was expected to record similar ozone levels. The site, which opened in 2001, is located south of downtown Sunnyvale in a residential area. This site was closed on November 30, 2008 because studies have shown that ozone levels at Sunnyvale are well correlated with ozone levels at the San Jose station. Sunnyvale does not have any major industrial sources.

During the most recent 3 years, this site recorded two exceedances of the 75 ppb national 8-hour ozone standard.

Sunnyvale Site Information

Site Name	Sunnyvale - 7030
AQS ID	06-085-2007
GIS coordinates	Latitude: 37.3555° N, Longitude: 122.0509° W
Location	Shelter alongside fire station wall
Address	910 Ticonderoga Drive, Sunnyvale CA 94087
County	Santa Clara
Distance to road from gaseous probe	Mary Ave: 20.7 meters Ticonderoga Drive: 28.3 meters
Traffic count	Mary Ave: 13,000 ADT (2001) Ticonderoga Drive: 1000 ADT (2008)
Groundcover	Paved
Representative Area	San Jose-Sunnyvale-Redwood City MSA

Sunnyvale Monitor Information

Pollutant	O3
Monitoring Objective	Population oriented
Spatial scale	Neighborhood
Sampling method	TECO 49C
PM filter analysis method	N/A
Data Start date	04/01/01
Operation schedule	Continuous
Sampling season	Apr 1 – Nov 30
Probe height (AGL)	5.7 m
Probe height above fire station roof	1.2 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	11.3 m
Distance to furnace or incinerator flue	5.3 m
Distance between collocated monitors	N/A
Unrestricted airflow	360º
Probe material	Teflon
Residence time	12 s
Will there be changes within the next 18 mos?	Yes
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 (gaseous)	Daily
Last Annual Performance Evaluation (gaseous)	11/13/08
Last two semi-annual flow rate audits for PM monitors	N/A

Vallejo

Vallejo was chosen for an air monitoring site because it is the largest city in Solano County with a 2008 population estimate of 121,055. Vallejo's climate is influenced by marine air flow through the Carquinez Strait that typically keeps pollution levels low. However, Vallejo has the potential to be impacted by pollution from three directions: daytime southwest winds bringing ozone and ozone precursors from the San Francisco Bay Area, nighttime north winds bringing particulates from the Napa Valley, and east winds bringing ozone and particulates from the Central Valley.

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, NO, and NO_2 are measured because south winds can transport ozone and its precursors into Vallejo from the heavily populated central Bay Area. Ozone also can be transported from the Central Valley through the Carquinez Strait during easterly winds. $PM_{2.5}$ is measured because high concentrations typically occur during the winter when nighttime valley drainage winds, wood burning, and shallow temperature inversions trap pollutants from local sources and the Napa Valley to the north. East winds can also transport particulate into Vallejo through the Carquinez Strait 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 at Vallejo to monitor general population exposure and because refineries located to the south and east can be significant sources of SO_2.

PM_{10} has been monitored at Vallejo since 1994. There has never been an exceedance of the national 24-hour PM_{10} standard recorded at Vallejo. Since 2003, concentrations have been less than half of the 24-hour national standard. The Air District discontinued PM_{10} monitoring at the site on June 30, 2008 because no exceedances of the national PM_{10} standard are expected to occur based on monitoring history, and because analyses have shown that PM_{10} levels can be estimated by multiplying the $PM_{2.5}$ measurements at the site by a factor of 1.5.

During the most recent 3 years, this site recorded three exceedances of the California 8-hour ozone standard. The national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ was exceeded on thirteen days.

Vallejo Site Information

Site Name	Vallejo - 8004
AQS ID	06-095-0004
GIS coordinates	Latitude: 38.1025° N, Longitude: 122.2380° W
Location	One story commercial building
Address	304 Tuolumne St, Vallejo CA 94590
County	Solano

Vallejo Site Information (continued)

Dist. to road from probe	Tuolumne St: 18 meters Capitol St: 30 meters Solano Ave: 33 meters Interstate 80: 700 meters
Traffic count	Tuolumne St: 5,100 ADT (2008) Capitol St: 500 ADT est. (2008) Solano Ave: 8,600 ADT (2008) Interstate 80: 142,000 ADT (2006)
Groundcover	Paved
Representative Area	Vallejo-Fairfield MSA

Vallejo Monitor Information

Pollutant	O3	CO	NO/NO2	SO2
Monitoring Objective	Population oriented	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	TECO 49i	TECO 48A	TECO 42C	TECO 43C
PM Filter Analysis method	N/A	N/A	N/A	N/A
Start date	07/01/76	07/01/76	07/01/76	07/01/76
Operation schedule	Continuous	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year	All year
Probe height (AGL)	9.6 m	9.6 m	9.6 m	9.6 m
Probe height above roof	4.3 m	4.3 m	4.3 m	4.3 m
Distance from obstructions on roof	None	None	None	None
Distance from obstructions not on roof	None	None	None	None
Distance from tree (DL)	N/A	N/A	N/A	N/A
Distance to furnace or incinerator flue	3.7 m	3.7 m	3.7 m	3.7 m
Distance between collocated monitors	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	Teflon
Residence time	12 s	13 s	14 s	14 s
Will there be changes within the next 18 mos?	No	No	No	No
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 (gaseous)	Daily	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	10/22/08	10/22/08	10/22/08	10/22/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A

Vallejo Monitor Information

Pollutant	PM10**	SASS PM2.5	FRM PM2.5* 11/01/08-12/31/08	Continuous PM2.5 (BAM)
Monitoring Objective	Population oriented	Population oriented	Population oriented	Population oriented
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	Andersen GUV-16HBLA	Met One SASS	*Partisol Plus 2025 w/VSCC	Met One BAM 1020
PM Filter Analysis method	Weighed by Air District	Weighed by DRI	Weighed by Air District	N/A
Start date	11/04/94	6/11/08	03/10/99	01/01/04
Operation schedule	1 in 6	1 in 6	Apr-Sep: 1in 6 Oct-Mar: daily	Continuous
Sampling season	All year**	All Year	All year	All year
Probe height AGL	5.7 m	6.6 m	6.5 m	5.8 m
Probe height above roof	1.7 m	2.3 m	2.3 m	1.9m
Distance from obstructions on roof	None	None	None	None
Distance from obstructions not on roof	None	None	None	None
Distance from tree (DL)	N/A	N/A	N/A	N/A
Distance to furnace or incinerator flue	4.7 m	5.4m	6.3m	2.5 m
Distance between collocated monitors	N/A	N/A	N/A	N/A
Distance between PM10 and PM2.5 samplers	PM10 to PM2.5: 4.7 m PM10 to BAM: 3.5m	SASS to PM2.5: 3.1m SASS to BAM: 2.9 m	PM2.5 to PM10: 4.7m PM2.5 to BAM: 4.0 m PM2.5 to SASS: 3.1 m	BAM to PM10: 3.5 m BAM to PM2.5: 4.0 m BAM to SASS: 2.9 m
Unrestricted airflow	360°	360°	360°	360°
Probe material	N/A	N/A	N/A	N/A
Residence time	N/A	N/A	N/A	N/A
Will there be changes within the next 18 mos?	N/A	No	No	No
Is it suitable for comparison against the annual PM2.5?	N/A	No	Yes	No – not reference or equivalent method
Frequency of flow rate verification for manual PM samplers	Weekly	Monthly	Monthly	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 (gaseous)	N/A	N/A	N/A	N/A
Last Annual Performance Evaluation (gaseous)	N/A	N/A	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	07/24/08 04/29/08	12/23/08 09/24/08	12/11/08 04/29/08	10/20/08 04/29/08

* Partisol-Plus 2025 replaced Andersen RAAS300 on 11/1/2008.
** PM10 discontinued on 06/30/2008.

Detailed Site Information for non-SLAMS Monitors

Benicia

The Air District conducted a short-term ambient air monitoring study to determine the impact to local residents from the Valero Refinery in eastern Benicia. The City of Benicia is located along the north side of the Carquinez Strait with a 2008 population of 27,977 where predominant westerly winds carry refinery pollutants away from populated areas. However, residents of newer housing constructed in areas west of the refinery are concerned about possible exposure to refinery emissions during periods of easterly wind.

The Air District placed a mobile air monitoring station on vacant land adjacent to the Valero Refinery. The trailer was located 0.6 miles west of the main refinery facilities, and 0.1 miles northeast of the nearest residential area. The only other significant pollution source in the area is Interstate 780, located 0.3 miles southwest. The site became operational in April 2007. The objective of this study was source-oriented monitoring for primary pollutants emitted by the refinery, specifically particulates (both $PM_{2.5}$ and PM_{10}), toxic organic compounds, heavy metals, sulfur dioxide, and nitrogen oxides. Carbon monoxide (and particulate) monitoring are of interest because of significant vehicular traffic on Interstate 780. Because Benicia does not have a permanent air monitoring station, the Air District also monitored population exposure to ozone. After 21 months, the community monitoring project ended and the station was shut down on December 31, 2008.

During the period of operation, this site recorded three exceedances of the 75 ppb national 8-hour ozone standard. The continuous $PM_{2.5}$ (BAM) monitor at Benicia recorded measurements above the national 24-hour $PM_{2.5}$ standard on nine days. However, this monitor is not a recognized FRM or FEM method, and the data cannot be used to determine violations of the national $PM_{2.5}$ standards, or its attainment status. Only filter-based $PM_{2.5}$ measurements may be used for comparison with the national $PM_{2.5}$ standards. There was one exceedance of the California 24-hour PM_{10} standard.

Hourly gaseous concentrations are available on the Air District web site. Pollutant summaries for all measurements from this study have been made available to local community groups and the City of Benicia.

Benicia Site Information

Site Name	Benicia – 8008
AQS ID	06-095-0006
GIS coordinates	Latitude: 38.0656° N, Longitude: 122.1507° W
Location	E Second Street and Tennys Dr.
Address	E Second Street and Tennys Dr., Benicia CA 94510
County	Solano
Distance to road from gaseous probe	E Second Street: 435 meters Tennys Dr: 155 meters Interstate 780: 508 meters
Traffic count	E Second Street: 7900 ADT (2005) Tennys Dr: 300 ADT (2008) State Route 780 at Second Street: 56,000 (2007)
Groundcover	Vegetative (year round)
Representative Area	Vallejo-Fairfield MSA

Benicia Monitor Information

Pollutant	O3	CO	NO/NO2	SO2
Monitoring Objective	Population Oriented & Source Impact	Population Oriented & Source Impact	Population Oriented & Source Impact	Population Oriented & Source Impact
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	TECO 49C	TECO 48A	TECO 42C	TECO 43C
PM filter analysis method	N/A	N/A	N/A	N/A
Data Start date	04/01/07	04/01/07	04/01/07	04/01/07
Operation schedule	Continuous	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year	All year
Probe height (AGL)	5.4 m	5.4 m	5.4 m	5.4 m
Probe height above roof	2.5 m	2.5 m	2.5 m	2.5 m
Distance from obstructions on roof	None	None	None	None
Distance from obstructions not on roof	None	None	None	None
Distance from tree (DL)	>50 m	>50 m	>50 m	>50 m
Distance to furnace or incinerator flue	3.0 m	3.0 m	3.0 m	3.0 m
Distance between collocated monitors	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	Teflon
Residence time	11 s	12 s	12 s	14 s
Will there be changes within the next 18 mos?	Yes	Yes	Yes	Yes
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 (gaseous)	Daily	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	12/23/08	12/23/08	12/23/08	12/23/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A

Benicia Monitor Information

Pollutant	PM10	Continuous PM2.5 (BAM)
Monitoring Objective	Population Oriented & Source Impact	Population Oriented & Source Impact
Spatial scale	Neighborhood	Neighborhood
Sampling method	Andersen HiVol 1200	Met One BAM 1020
PM Filter Analysis method	Weighed by Air District	N/A
Data Start date	04/06/07	04/01/07
Operation schedule	1 in 6	Continuous
Sampling season	All year	All year
Probe height AGL	5.7 m	5.9 m
Probe height above roof	1.7 m	1.9 m
Distance from obstructions on roof	None	None
Distance from obstructions not on roof	None	None
Distance from tree (DL)	>50 m	>50 m
Distance to furnace or incinerator flue	4.7 m	3.0 m
Distance between collocated monitors	N/A	N/A
Distance between PM10 and PM2.5 samplers	PM10 to BAM: 2 m	BAM to PM10: 2 m
Unrestricted airflow	360°	360°
Probe material	N/A	N/A
Residence time	N/A	N/A
Will there be changes within the next 18 mos?	Yes	Yes
Is it suitable for comparison against the annual PM2.5?	N/A	No – not reference or equivalent method
Frequency of flow rate verification for manual PM samplers	Weekly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	Bi-weekly
Frequency of one-point QC check (gaseous)	N/A	N/A
Last Annual Performance Evaluation (gaseous)	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	12/22/08 05/28/08	12/22/08 05/28/08

Berkeley

The Air District is conducting a two year ambient air monitoring study in Berkeley. The purpose of the study is to determine the pollution impacts to local residents from vehicular traffic and industry along the Highway 80 corridor. The City of Berkeley has a 2008 population of 107,178 but the west side of Berkeley has the highest pollutant emission density within the city. Traffic levels are extremely high on Highway 80, with frequent traffic slowdowns during morning and evening commute times, which can produce significant amounts of hydrocarbons and particulates. Industrial sources along the highway, particularly Pacific Steel Casting (PSC), have made local residents concerned about possible exposure to particulates and toxic compounds. These sources, located on the west side of Berkeley, commonly transport pollutants downwind into Berkeley due to prevailing westerly winds.

The mobile air monitoring station is sited in West Berkeley because this area is expected to have the highest impacts due to close proximity to the sources. The trailer is located 0.30 miles east of Highway 80 and 0.25 miles downwind from PSC in a residential neighborhood. The site became operational in December 2007. Although the purpose of the study is primarily source-oriented exposure from the highway and local industry emissions, the Air District is also monitoring population exposure to criteria pollutants including ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide.

In 2008, this site did not exceed any national or California ozone standards. The continuous $PM_{2.5}$ (BAM) monitor at Berkeley recorded measurements above the national 24-hour $PM_{2.5}$ standard on two days in 2008. However, this monitor is not a recognized FRM or FEM method, and the data cannot be used to determine violations of the national $PM_{2.5}$ standards, or its attainment status. Only filter-based $PM_{2.5}$ measurements may be used for comparison with the national $PM_{2.5}$ standards.

Hourly gaseous concentrations are available real-time on the Air District web site. Pollutant summaries for all measurements from this study will be made available to local community groups and the City of Berkeley. The site is expected to be closed at the end of 2009.

Berkeley Site Information

Site Name	Berkeley - 1026
AQS ID	06-001-2004
GIS coordinates	Latitude: 37.8778° N, Longitude: 122.3013° W
Location	Camelia Street and 6th St.
Address	1398 6th St., Berkeley CA 94710
County	Alameda

Berkeley Site Information (continued)

Distance to road from gaseous probe	Camelia Street: 27 meters 6th Street: 36 meters Gilman Street: 164 meters Interstate 80: 482 meters
Traffic count	Camelia Street: 500 ADT est. (2009) 6th Street: 1,500 ADT est. (2009) Gilman Street: 16,500 (1999) Interstate 80: 272,000 (2007)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Berkeley Monitor Information

Pollutant	O3	CO	NO/NO2	SO2	CH4/NMOC
Monitoring Objective	Population Oriented & Source Impact	Population Oriented & Source Impact	Population Oriented & Source Impact	Population Oriented & Source Impact	Population Oriented & Source Impact
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling method	TECO 49C	API 300E	TECO 42C	TECO 43C	TECO 55C
PM filter analysis method	N/A	N/A	N/A	N/A	N/A
Start date	12/13/07	12/13/07	12/13/07	12/13/07	CH4: 12/13/07 NMOC: 12/13/07
Operation schedule	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	All year	All year	All year	All year	All year
Probe height (AGL)	5.7 m	5.7 m	5.7 m	5.7 m	5.7 m
Probe height above roof	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m
Distance from obstructions on roof	None	None	None	None	None
Distance from obstructions not on roof	None	None	None	None	None
Distance from tree (DL)	16 m	16 m	16 m	16 m	16 m
Distance to furnace or incinerator flue	17 m	17 m	17 m	17 m	17 m
Distance between collocated monitors	N/A	N/A	N/A	N/A	N/A
Unrestricted airflow	360°	360°	360°	360°	360°
Probe material	Teflon	Teflon	Teflon	Teflon	Teflon
Residence time	12 s	13 s	13 s	13 s	13 s
Will there be changes within the next 18 mos?	Yes	Yes	Yes	Yes	Yes
Is it suitable for comparison against the annual PM2.5?	N/A	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	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	N/A	N/A	N/A	N/A
Frequency of one-point QC check (gaseous)	Daily	Daily	Daily	Daily	Daily
Last Annual Performance Evaluation (gaseous)	11/19/08	11/19/08	11/19/08	11/19/08	11/19/08
Last two semi-annual flow rate audits for PM monitors	N/A	N/A	N/A	N/A	N/A

Berkeley Monitor Information

Pollutant	PM10	Continuous PM2.5 (BAM)
Monitoring Objective	Population Oriented & Source Impact	Population Oriented & Source Impact
Spatial scale	Neighborhood	Neighborhood
Sampling method	Tisch Env. HiVol TE-6000	Met One BAM 1020
PM Filter Analysis method	Weighed by Air District	N/A
Start date	12/14/07	12/18/07
Operation schedule	1 in 6	Continuous
Sampling season	All year	All year
Probe height AGL	4.4 m	4.8 m
Probe height above roof	1.5 m	2.2 m
Distance from obstructions on roof	None	None
Distance from obstructions not on roof	None	None
Distance from tree (DL)	20 m	17 m
Distance to furnace or incinerator flue	17 m	17 m
Distance between collocated monitors	N/A	N/A
Distance between PM10 and PM2.5 samplers	PM10 to BAM: 2.7 m	BAM to PM10: 2.7 m
Unrestricted airflow	360°	360°
Probe material	N/A	N/A
Residence time	N/A	N/A
Will there be changes within the next 18 mos?	Yes	Yes
Is it suitable for comparison against the annual PM2.5?	N/A	No – not reference or equivalent method
Frequency of flow rate verification for manual PM samplers	Weekly	N/A
Frequency of flow rate verification for automated PM analyzers	N/A	Bi-Weekly
Frequency of one-point QC check (gaseous)	N/A	N/A
Last Annual Performance Evaluation (gaseous)	N/A	N/A
Last two semi-annual flow rate audits for PM monitors	05/19/08 11/18/08	05/19/08 11/18/08

Crockett

Crockett was chosen for SO_2 source impact monitoring because it is downwind of the ConocoPhillips 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 2000 estimated population of 3,194. 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 the Crockett area is C&H Sugar, which is not a significant source of SO_2 emissions.

No exceedances of any State or national SO_2 standards were measured in the most recent 3 years at this site.

Crockett is classified as an SPM site. EPA siting criteria specifies that the probe be located at least 10 meters from the drip line of all trees. The closest tree drip line to the probe is 1.2 meters away, but since the tree is located outside of the required 180 degree arc of unrestricted airflow for source impact monitoring as determined by the predominant wind direction and the direction of the refinery, the close proximity of that tree is irrelevant. The closest tree drip line within the 180 degree arc is 4.9 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. Consequently, since one of the siting criteria for a SLAMS site cannot be met, an EPA waiver will be requested in 2009 in order to continue to classify this as an SPM site.

Crockett Site Information

Site Name	Crockett - 2017
AQS ID	06-013-1001
GIS Coordinates	Latitude: 38.0549º N, Longitude: 122.23328º W
Location	Pump house
Address	End of Kendall Avenue, Crockett CA 94525
County	Contra Costa
Distance to road from gaseous probe	San Pablo Ave: 68.4 meters
Traffic count	San Pablo Ave: 8,763 ADT (2007)
Groundcover	Vegetative
Representative Area	San Francisco-Oakland-Fremont MSA

Crockett Monitor Information

Pollutant	**SO2**
Monitor Objective	Source impact
Spatial scale	Neighborhood
Sampling method	TECO 43C
PM filter analysis method	N/A
Start date	01/01/79
Operation schedule	Continuous
Sampling season	All year
Probe height (AGL)	6.2 m
Probe height above roof	2.4 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	4.9 m*
Distance to furnace or incinerator flue (m)	N/A
Distance between collocated monitors	N/A
Unrestricted airflow	270°
Probe material	Teflon
Residence time	10 s
Will there be changes within the next 18 mos?	Yes
Is it suitable for comparison against the annual PM2.5?	N/A
Frequency of flow rate verification for manual PM samplers audit	N/A
Frequency of flow rate verification for automated PM analyzers audit	N/A
Frequency of one-point QC check (gaseous)	Weekly
Last Annual Performance Evaluation (gaseous)	11/13/08
Last two semi-annual flow rate audits for PM monitors	N/A

* Closest tree within the 180 degree arc of unrestricted air flow for source impact monitoring.

Cupertino

The Air District is conducting a one year particulate study in Cupertino to determine if emissions from the nearby Hanson Cement Plant and its associated diesel truck traffic could be producing elevated particulate concentrations in nearby neighborhoods. The monitoring site has been placed in a residential area just east of Permanente Canyon where the Hanson Cement Plant is located and adjacent to Stevens Creek Boulevard which is the main route for truck traffic using the plant. The site became operational in October 2008, and expected to be operational for a little over one year.

Because cement plant and diesel truck emissions tend to produce larger-sized particles, a PM_{10} monitor is being used to measure the impacts. To measure the PM_{10}, a continuous monitor was chosen (a beta attenuation monitor) which outputs hourly-averaged concentrations, allowing correlations with the hourly emissions from the plant and the truck traffic which vary during the day.

Wind speed, wind direction, and temperature are also measured onsite, which will show the periods when the site is downwind of the plant and road. Preliminary wind data show that daytime winds are generally from the northwest, so that the residential areas are upwind of the plant. Nighttime winds are from the south and southwest and do have the potential to transport emissions from Hanson Cement and Stevens Creek Boulevard to nearby residential areas.

The monitor has not recorded any PM_{10} concentrations above the national 24-hour PM_{10} standard of 150 $\mu g/m^3$ through May 31, 2009. It did record two days in November and December 2008 that were over the State 24-hour standard of 50 $\mu g/m^3$. However, particulate concentrations were elevated in most parts of the Bay Area on those days. Hourly particulate concentrations and wind data for the Cupertino site can be viewed real-time on the Air District web site.

Cupertino Site Information

Site Name	Cupertino - 7034
AQS ID	N/A
GIS coordinates	Latitude: 37.3216° N, Longitude: 122.0713° W
Location	One story building
Address	22638 Stevens Creek Blvd. Cupertino, CA 95014
County	Santa Clara
Distance to road from monitor	Stevens Creek Blvd: 40.2 m Prado Vista Drive: 36.6 m Foothill Blvd: 228.6 m Silver Oak Lane: 152.4 m
Traffic count	Stevens Creek Blvd: 5827 ADT (2000) Prado Vista Drive: 200 ADT est. (2008) Foothill Blvd: 16,001 ADT (2007) Silver Oak Lane: 500 ADT est. (2008)
Groundcover	Gravel
Representative Area	San Francisco-Oakland-Fremont MSA

Cupertino Monitor Information

Pollutant	Continuous PM10 (EBAM)
Monitoring Objective	Population Oriented & Source Impact
Spatial scale	Neighborhood
Sampling method	Met One EBAM
PM Filter Analysis method	N/A
Start date	10/29/08
Operation schedule	Continuous
Sampling season	All year
Probe height AGL	5.0 m
Probe height above roof	2.2 m
Distance from obstructions on roof	N/A
Distance from obstructions not on roof	32.3 m
Distance from tree (DL)	24.3 m
Distance to furnace or incinerator flue	15.9 m
Distance between collocated monitors	N/A
Distance between PM10 and PM2.5 samplers	N/A
Unrestricted airflow	360°
Probe material	N/A
Residence time	N/A
Will there be changes within the next 18 mos?	Yes
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	Bi-Weekly
Frequency of one-point QC check (gaseous)	N/A
Last Annual Performance Evaluation (gaseous)	N/A
Last two semi-annual flow rate audits for PM monitors	12/10/08*

* Site opened 10/29/2008.

Oakland PM2.5 SPM

The Air District moved the Oakland air monitoring station in 2007. A $PM_{2.5}$ monitor was added at the new site because EPA had recently implemented a more stringent 24-hour $PM_{2.5}$ standard in 2006. The revised standard made it more likely that exceedances could occur in the Oakland area. Oakland has large potential sources of particulate emissions within its boundaries, such as a major maritime port, an international airport, extensive areas of industry, and a number of major freeways. Additionally, light winds combined with surface based-based inversions during the winter months can cause elevated particulate levels.

The purpose of monitoring $PM_{2.5}$ in Oakland is to determine if $PM_{2.5}$ levels approach the State or national standards. Because the Air District is already operating more than the required number of $PM_{2.5}$ monitors for the San Francisco-Oakland-Fremont MSA, the Oakland $PM_{2.5}$ monitor has been designated as a Special Purpose Monitor (SPM). If monitoring shows that $PM_{2.5}$ levels are significant, then the monitoring may become permanent.

Only one exceedance of the revised national 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ was measured (in February 2009) since the monitor began operating in 2007. If the monitor continues to show low $PM_{2.5}$ concentrations though 2009, then the monitor will be removed in 2010.

Oakland Site Information

Site Name	Oakland - 1025
AQS ID	06-001-0009
GIS coordinates	Latitude: 37.7431 ° N, Longitude: 122.16991° W
Location	Two-story commercial building
Address	9925 International Blvd, Oakland CA 94603
County	Alameda
Distance to road from $PM_{2.5}$ inlet	International Blvd: 18 meters 99^{th} St: 23 meters 98^{th} St: 43 meters
Traffic count	International Blvd: 26,912 ADT (2006) 99^{th} St: 100 ADT (Estimate) 98^{th} St: 31,340 ADT (2002)
Groundcover	Paved
Representative Area	San Francisco-Oakland-Fremont MSA

Oakland PM2.5 SPM Information

Pollutant	**FRM PM2.5***
Monitoring Objective	Population oriented
Spatial scale	Middle
Sampling method	*Partisol-Plus 2025 w/VSCC
Analysis method	Weighed by Air District
Start date	11/01/07
Operation schedule	Apr-Sep: 1 in 6 Oct-Mar: 1 in 3
Sampling season	All year
Probe height (AGL)	8.0 m
Probe height above roof	2.4 m
Distance from obstructions on roof	None
Distance from obstructions not on roof	None
Distance from tree (DL)	21 m
Distance to furnace or incinerator flue	N/A
Distance between collocated monitors	N/A
Unrestricted airflow	360°
Probe material	N/A
Residence time	N/A
Will there be changes within the next 18 mos?	Yes
Is it suitable for comparison against the annual PM2.5?	Yes
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 (gaseous)	N/A
Last Annual Performance Evaluation (gaseous)	N/A
Last two semi-annual flow rate audits for PM monitors	12/04/08 05/07/08

* Partisol-Plus 2025 replaced Andersen RAAS300 on 12/01/2008.

National Air Toxics Trends Station (NATTS) at San Jose

EPA established the National Air Toxics Trends Stations (NATTS) network in 2003. NATTS was created to expand and improve national toxics monitoring with the major goal of identifying toxics trends in urban and rural settings throughout the United States. The Air District operates a NATTS monitoring site the San Jose air monitoring station. EPA and the Air District agreed to include San Jose in the NATTS network because it has a history of air toxics data back to 1990, and because San Jose is the largest city in Northern California with a 2008 population of 1,006,892. NATTS pollutants can be grouped into three categories: hazardous air pollutants, continuous measurements, and polycyclic aromatic hydrocarbons.

Hazardous Air Pollutants (HAPs) Measurements

The Clean Air Act Amendments of 1990 listed 188 HAPs of interest. Of these, EPA selected fifteen HAPs for trends analysis in the original 2003 NATTS monitoring program. These selections were based on toxicity, available measurement methods, cost of measurement, correlation with other important HAPs, and anticipated concentration levels. Table 7 lists the fourteen NATTS HAPs measured by the Air District along with the year measurements began. Hexavalent chromium is the only required NATTS airborne toxic compound that the Air District does not measure, because the current sampling methodology allows significant deterioration of the compound before the analysis can be performed. Total chromium is measured instead as an indicator of Hexavalent chromium concentrations. In the future, the Air District may sample for Hexavalent chromium when better sampling techniques are developed.

Table 7. List of the 14 NATTS HAPs Monitored by the Air District.

Hazardous Air Pollutant or Species	Year Valid Measurements Began	Parameter Type	Sample Source	Analyzing Lab	Analysis equipment
Benzene	1990	VOC	SUMMA canister	BAAQMD	GC
1, 3 Butadiene	1994	VOC	SUMMA canister	BAAQMD	GC
Carbon tetrachloride	1990	VOC	SUMMA canister	BAAQMD	GC
Chloroform	1990	VOC	SUMMA canister	BAAQMD	GC
Tetrachloroethylene	1990	VOC	SUMMA canister	BAAQMD	GC
Trichloroethylene	1990	VOC	SUMMA canister	BAAQMD	GC
Acrolein	2008	VOC	SUMMA canister	BAAQMD	GC/MS
Formaldehyde	2006	Carbonyl	cartridge	BAAQMD	HPLC
Acetaldehyde	2006	Carbonyl	cartridge	BAAQMD	HPLC
Antimony	2008	metal	¼ PM10 filter	ERG	XRF
Arsenic	2008	metal	¼ PM10 filter	ERG	XRF
Cadmium	2008	metal	¼ PM10 filter	ERG	XRF
Manganese	2008	metal	¼ PM10 filter	ERG	XRF
Nickel	2008	metal	¼ PM10 filter	ERG	XRF

Emission sources of the NATTS HAPs in Table 7 above:

- 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.
- 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.
- Antimony comes from the soil.
- 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.

The Air District samples for the 14 NATTS pollutants and chromium on a 1-in-6 day schedule. Benzene; 1, 3 butadiene; acrolein; trichloroethylene; carbon tetrachloride; chloroform; and trichloroethylene are collected in canisters over a 24-hour period using a Xontec 910a sampler. The canister contents are then analyzed in the Air District laboratory using a Gas Chromatograph (GC) or Gas Chromatograph/Mass Spectrometer (GC/MS). Formaldehyde and acetaldehyde (carbonyls) are collected using a cartridge on one sampling channel of a Xontec 924 toxics sampler. In the Air District laboratory, exposed cartridges are analyzed for carbonyls using a High Pressure Liquid Chromatograph (HPLC). NATTS metals (except Hexavalent chromium) are measured for 24 hours using a quarter section of a standard PM_{10} filter. The exposed quarter filter sections are sent to ERG (EPA's designated contract laboratory) for analysis using X-Ray Fluorescence (XRF).

Continuous Measurements

As part of the NATTS program, the Air District makes continuous measurements of carbon monoxide and black carbon. High sensitivity carbon monoxide is measured as an analysis tool because of correlation to benzene and 1, 3 butadiene, two of the largest contributors to air toxic exposure. Black carbon is measured because it is correlated to diesel emissions that are identified by EPA as a mobile source air toxic.

Polycyclic Aromatic Hydrocarbons (PAHs) Measurements

In May 2008, the Air District began sampling for a number of PAHs under the NATTS program. 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. The PAH compounds that the Air District measures are listed in Table 8.

Table 8. List of 22 NATTS PAH Compounds Measured by the Air District.

9-Fluorenone	Coronene
Acenaphthene	Cyclopenta(cd)pyrene
Acenaphthylene	Dibenz(a,h)anthracene
Anthracene	Fluoranthene
Benzo(a)anthracene	Fluorene
Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene
Benzo(b)fluoranthene	Naphthalene
Benzo(e)pyrene	Perylene
Benzo(g,h,i)perylene	Phenanthrene
Benzo(k)fluoranthene	Pyrene
Chrysene	Retene

The Air District does not have the equipment to meet the specific requirements to perform the analysis for these compounds, so ERG (EPA's designated contract laboratory) provides the filter media and analysis. PAH compounds are collected on a filter for a 24-hour period using a standard Hi-Vol Polyurethane Foam (PUF) sampler on the NATTS 1-in-6 day sampling schedule. Filters are then sent to the ERG laboratory for analysis.

Summary NATTS data are available from the EPA's AirData web site at http://www.epa.gov/oar/data/index.html. These data may also be found on the BAAQMD web site in the Toxic Air Contaminant Control Program Annual Report at http://www.baaqmd.gov/Divisions/Engineering/Air-Toxics/Toxic-Air-Contaminant-Control-Program-Annual-Report.aspx.

$PM_{2.5}$ Speciation Sampling Program

EPA established a fine particulate ($PM_{2.5}$) standard in 1997 and required States to install and operate new $PM_{2.5}$ samplers to determine where the national ambient $PM_{2.5}$ air standards are not being met. As part of the monitoring program, EPA established a nationwide network of speciation monitoring sites with the primary purpose of identifying which chemical species were the key components at locations that exceeded the standard. This network is known as the Chemical Speciation Network. The CSN network has 54 long-term sites, known as Speciation Trends Network sites, and approximately 150 other sites that can be relocated if State and local agencies choose. The Air District monitors $PM_{2.5}$ at nine locations in the Bay Area, has one STN site, and two CSN sites.

Speciation Trends Network (STN) Program

STN sites have the primary objective of defining long-term concentration trends of the elements, ions, and organic and elemental carbon components that make up $PM_{2.5}$ particles. San Jose was chosen as an STN station because it was already collecting $PM_{2.5}$ mass, has recorded exceedances of the $PM_{2.5}$ standard, and is the largest city in Northern California with a 2008 population of 1,006,892.

$PM_{2.5}$ samples are collected using a Met One Spiral Ambient Speciation Sampler (SASS). The sampler operates from midnight to midnight of the next day, and samples on a 1 in 3 day schedule. Collocated with the SASS is a $PM_{2.5}$ filter sampler which is used to measure the total mass of $PM_{2.5}$ and to determine when exceedances of the standard occur. Filter sampling is on a 1 in 3 day schedule in the summer and daily in the winter. SASS sampling is scheduled to coincide with filter sampling days so that speciation information can be used to help identify sources and develop effective control strategies.

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 filter analysis is done by RTI International, an EPA contract laboratory in North Carolina. Sixty-three chemical species listed in Table 9 are measured from each SASS sample. These data are then submitted to the EPA AQS database by RTI International, and summary data can be viewed on the EPA's AirData web site at http://www.epa.gov/oar/data/index.html.

Chemical Speciation Network (CSN) Program

The Air District installed SASS samplers at its air monitoring stations in Vallejo and Livermore in 2008. The sites were selected for sampling because there was an interest in determining the source of $PM_{2.5}$ particles 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. The Air District also plans to install a SASS sampler at a new Oakland West monitoring station in early 2009 because it is downwind of the Port of Oakland, a major source of diesel particulate matter. The samplers, sampling procedures, and analysis techniques are the same

as for the STN program with the following exceptions: the collection frequency is 1 in 6 days and DRI provides the filters, does the analysis and submits the data to AQS. Summary data can also be viewed on the EPA's AirData web site at http://www.epa.gov/oar/data/index.html.

Table 9. SASS Speciation Measurements for $PM_{2.5}$ Samples Collected by the Air District.

Elements Measured			
Antimony	Cesium	Magnesium	Sodium
Arsenic	Europium	Mercury	strontium
Aluminum	Gallium	Nickel	Sulfur
Barium	Gold	Niobium	Tantalum
Bromine	Hafnium	Phosphorous	Terbium
Cadmium	Iron	Potassium	Tin
Calcium	Indium	Rubidium	Titanium
Chromium	Iridium	Samarium	Tungsten
Cobalt	Lanthanum	Scandium	Vanadium
Copper	Lead	Selenium	Yttrium
Chlorine	Manganese	Silicon	Zinc
Cerium	Molybdenum	Silver	Zirconium

Ions Measured	
Ammonium Cation	Chloride Anion
Potassium Cation	Nitrate Anion
Sodium Cation	Sulfate Anion

Organic and Elemental Carbon Measured using IMPROVE-A Method
Total Organic Carbon (sum of the OC Fractions below)
Total Elemental Carbon (sum of the EC Fractions below)
Elemental Carbon Fraction 1 (carbon released at 550ºC in 10% oxygen/90% helium gas)
Elemental Carbon Fraction 2 (carbon released at 700ºC in 10% oxygen/90% helium gas)
Elemental Carbon Fraction 3 (carbon released at 800ºC in 10% oxygen/90% helium gas)
Organic Carbon Fraction 1 (carbon released at 120ºC in helium gas)
Organic Carbon Fraction 2 (carbon released at 250ºC in helium gas)
Organic Carbon Fraction 3 (carbon released at 450ºC in helium gas)
Organic Carbon Fraction 4 (carbon released at 550ºC in helium gas)

Toxics Program

The Clean Air Act Amendments of 1990 required EPA to set emission standards for major sources of Hazardous Air Pollutants (HAPs), or air toxics. The Act also required EPA to assess the risks to human health from HAPs. In 2008, there were 187 HAPs listed by EPA. All toxic air pollutants listed by EPA are known to cause or are suspected of causing cancer, birth defects, reproduction problems, and other serious illnesses. Exposure to certain levels of some toxic air pollutants can cause difficulty in breathing, nausea or other illnesses. Exposure to certain toxic pollutants can even cause death.

Toxic pollutants 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, meteorology and transport by the wind.

The District's ambient air toxics monitoring program has been developed 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 2 is a map of the 21 Air District toxics monitoring sites in 2008. Most sites are located at existing Air District SLAMS and SPM monitoring stations and were selected to obtain a wide geographical coverage of contaminant levels throughout the Bay Area. The sites are located in major population centers or downwind of major industrial sources such as refineries. The toxics data collected at San Jose are also reported to EPA as part of the NATTS program.

Air samples are collected at all stations in the network for a 24 hour period on a one in twelve day schedule except at San Jose where the sampling schedule is one in six days to conform to the NATTS schedule. A one in twelve day 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 ARB use for their toxics monitoring program, thereby allowing Bay Area concentrations to be compared to toxic concentrations measured elsewhere across the country.

Toxics are collected in 6-liter SUMMA stainless steel canisters using a commercially available Xontech sampler. The canister continuously collects ambient air for 24-hours to ensure capturing transient and intermittent toxic releases. All canisters are analyzed within 30 days of sample collection using capillary gas chromatography employing photoionization and electron capture detectors.

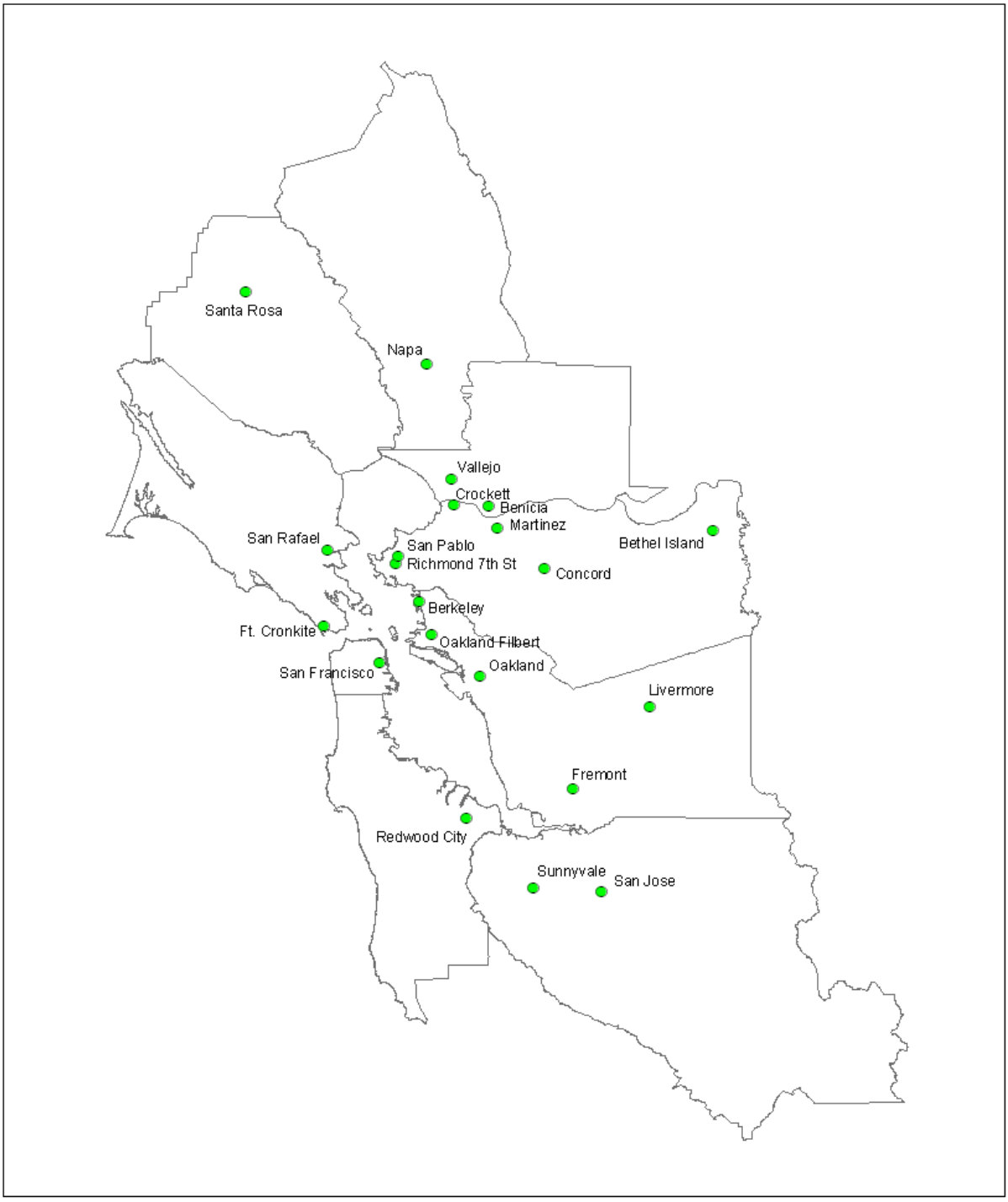


Figure 2. Map of Air District Toxics Monitoring Sites for 2008.

Canisters from all sites except Fremont are analyzed by chemists in the Air District laboratory. Canisters from Fremont are analyzed by ARB. The Air District operates collocated samplers at the San Francisco and San Jose stations and sends the canisters to ARB for analysis.

The Air District laboratory analyzes for the 19 toxic compounds listed in Table 10. Compounds selected for analyses were those that had either high emissions or high toxicity, or some high combination of the two. Another consideration was whether the current methodology could accurately detect a compound at reasonable expense, based on previous ARB studies.

Table 10. List of Toxic Compounds Measured by the Air District in 2008.

Acetone	Methyl Ethyl Ketone
Benzene	Methylene Chloride
1, 3 Butadiene	M/P Xylene
Carbon Tetrachloride	Perchloroethylene
Chloroform	1,1,2 Trichlorotrifluoroethane
Ethylbenzene	Trichloroethylene
Ethylene Dibromide	Trichlorofluoromethane
Ethylene Dichloride	Toluene
O-Xylene	Vinyl Chloride
Methyl Chloroform	

At San Jose, in addition to the 19 toxic compounds listed above, the Air District also measures Acrolein, Acetonitrile, Acroylonitrile, and Ethanol. A gas chromatography mass spectrometry instrument is used to measure these compounds from the canister samples. Measurements of Acrolein, Acetonitrile, and Acroylonitrile are done because of a request from ARB. Ethanol is measured because of a request from UC Berkeley. As new instrumentation becomes available, the Air District intends to do measurements of these compounds at more stations in 2009.

Summary toxics data are available from the EPA's AirData web site at http://www.epa.gov/oar/data/index.html. These data may also be found on the BAAQMD web site in the Toxic Air Contaminant Control Program Annual Report at http://www.baaqmd.gov/Divisions/Engineering/Air-Toxics/Toxic-Air-Contaminant-Control-Program-Annual-Report.aspx.

Appendix A

NCore Monitoring Station Plan for San Jose, California

Site Name	San Jose
AQS ID	06-085-0005
GIS coordinates	Latitude: 37.3484° N, Longitude: 121.8949° W
Address	158 E. Jackson St, San Jose CA 95112
County	Santa Clara
MSA represented	San Jose-Sunnyvale-Santa Clara
Date established	November 1, 2002
NCore Inspection date	September 11, 2008
NCore Inspected by	Nealson Watkins, EPA/OAQPS
NCore Site Approval Status	EPA Approval Pending

Project Background

In October 2006 the United States Environmental Protection Agency (EPA) revised 40 CFR Parts 53 and 58 to enhance ambient air quality monitoring to improve air quality measurements. One of the most significant changes in the regulations 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.

Air District Participation

EPA and the Air District cooperatively agreed to establish the Northern California NCore station in San Jose. EPA will provide funding and the Air District will operate the station. The station must be operational by January 1, 2011. This report will describe why San Jose was chosen as the site, where the station will be located, which monitors will be used, and where the data are to be archived.

Project Organization

The Air District's NCore Project at San Jose will be managed by the Technical Services Division. Specific NCore responsibilities are assigned to the Air Monitoring, Laboratory Services, and Meteorology and Quality Assurance Section (MQA) sections within the Division, to outside contractors, and to the Planning Division as follows:

- Air Monitoring Section staff will operate and maintain the NCore station at San Jose, and ensure that methodologies and practices, including QC, meet or exceed NCore guidance, requirements, and recommendations.
- The Laboratory Services Section at the Air District office in San Francisco will analyze particulate filter samples collected by the Air Monitoring field staff.
- Chemical speciation filter analysis will be done under contract with RTI International.
- The MQA Section staff will electronically collect, quality assure, and submit to AQS all NCore data. This section will also audit air monitoring instruments and operate the NCore meteorological system.
- Staff meteorologists within the Research and Modeling Section of the Planning Division will review and quality assure all meteorological data collected at the NCore site.

Monitoring Site Selection

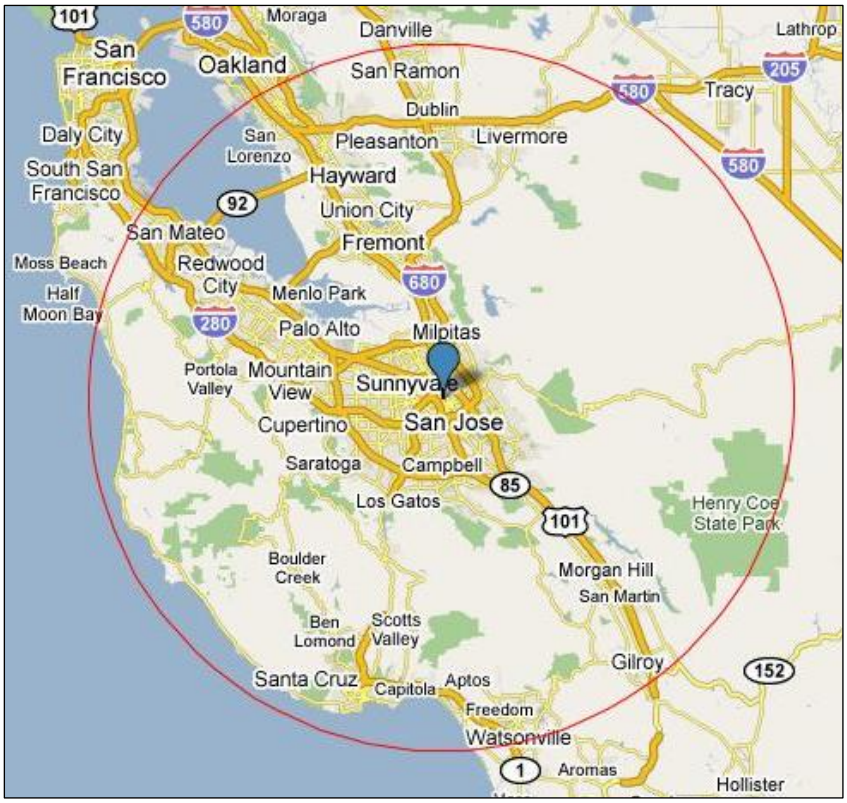
EPA designed the national NCore network to have a mixture of urban and rural sites. In Northern California, EPA desired a monitoring station that would represent a large urban area. Recommendations for locating NCore urban sites are found in 40 CFR Part 58 Appendix D and other EPA publications:

- Urban NCore stations are to be located at neighborhood or urban scale pollutant measurements to provide representative exposure levels throughout the metropolitan area population.
- Urban NCore stations should be located where significant pollution levels exist.
- Population oriented 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, STN, CASTNET, IMPROVE, NADP, PAMS) is encouraged.
- Siting of monitors at NCore sites must meet SLAMS requirements as specified in 40 CFR Part 58.

The Selection of the City of San Jose

The San Francisco Bay Area has a population of over 7 million residents, and is the largest metropolitan area in Northern California. Within the Bay Area, the city of San Jose is the largest city with 1 million residents. 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.



Urban scale, as defined by EPA, is a 4 km to 50 km radius around the site. Figure A-1 shows that a 50 km circle around the proposed site in San Jose includes the entire populated area in the southern Bay Area. The Air District and EPA staff agreed that the placement of the NCore site at San Jose provides the best location for measuring pollutant formation from local and neighboring areas as well as transport from other areas in the Santa Clara Valley.

Figure A-1. Map of the Santa Clara Valley and 50 km circle showing the urban boundary around the proposed NCore station.

San Jose meets all national air quality standards except ozone and $PM_{2.5}$. During the most recent 5 years, Air District monitoring in the San Jose area have recorded exceedances of the national ozone standard 6 times, and the 24-hour $PM_{2.5}$ standard 53 times. Table A-1 lists these exceedances by year.

Table A-1. Ozone and PM2.5 national exceedances in San Jose since 2004.

Pollutant (standard)	2004	2005	2006	2007	2008
Ozone (75 ppb)	0	1	3	0	2
PM2.5 (35 ug/m3)	14	17	8	9	5

NCore Monitoring Station Location

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 can not 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 oriented monitoring. Neighborhood scale has dimensions of 4 km around the monitoring station, and urban scale has a 50 km radius. Figure A-2 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.

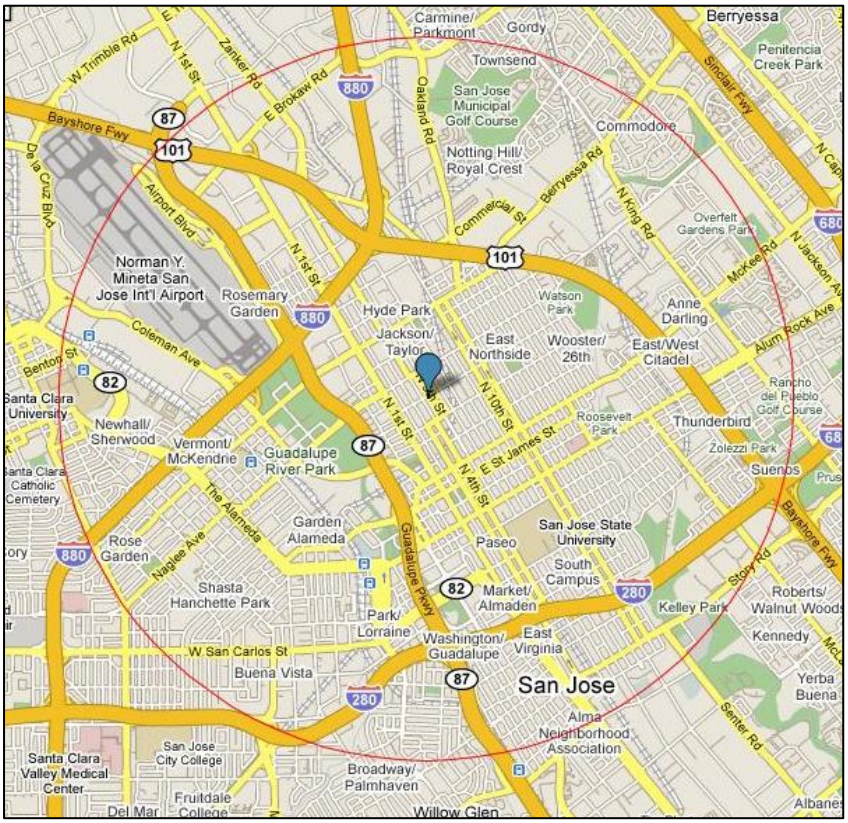


Figure A-2. Map of central San Jose and 4 km circle showing the neighborhood scale boundary around the proposed NCore station.

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 256 commercial and 141 general aviation departures and landings per day in 2008.
- 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. This existing station meets all the site selection criteria for an NCore station.

Monitor Siting Criteria

Placement of NCore monitors follow the same requirements as for SLAMS monitors as specified in 40 CFR Part 58 Appendix E. These requirements include minimum distances from local roadways, distance requirements from trees and obstructions, and specifications on the height of the probes or inlets. Figure A-3 shows a plan view of the sampling inlet placement on the rooftop of the San Jose site and distance to nearby buildings, trees, and roads.

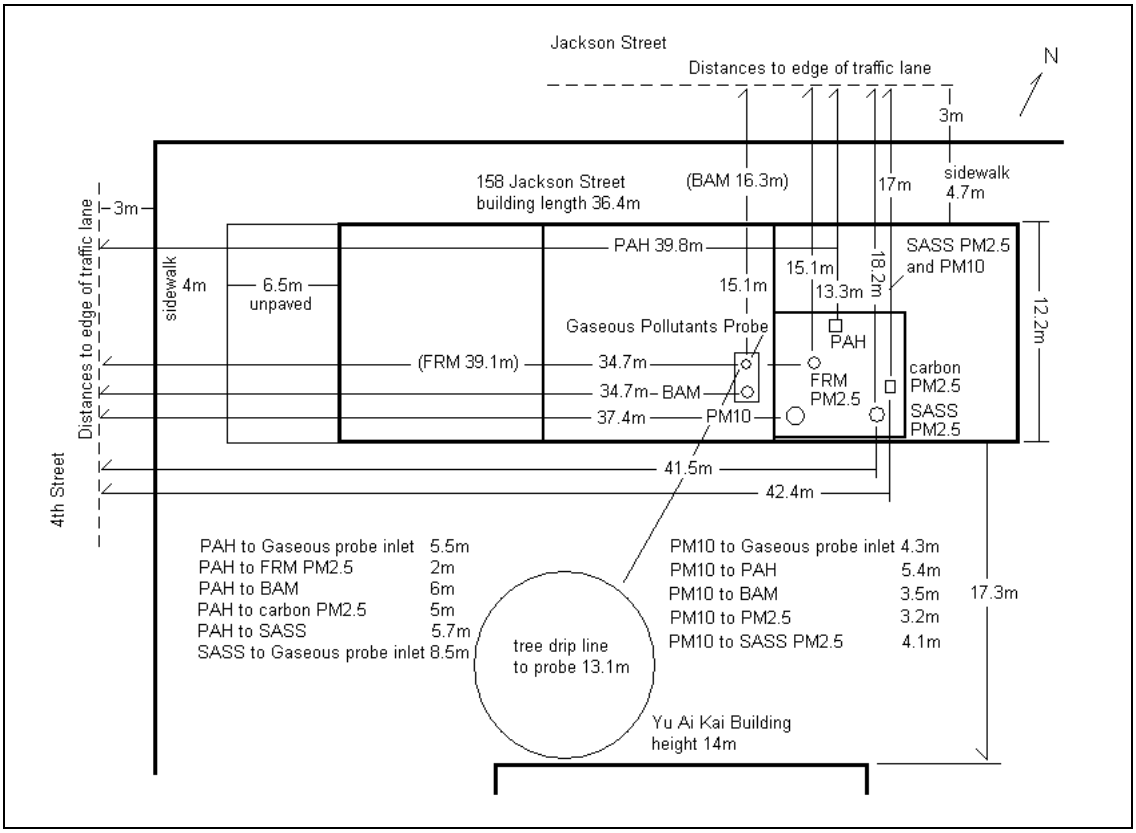


Figure A-3. Plan view of monitor placement on rooftop at San Jose site.

Spacing From Roadways

Neighborhood scale pollutant monitoring requires that monitors be placed at minimum distances from roadways depending on the pollutant and Average Daily Traffic (ADT) counts. Table A-2 summarizes information from tables E-1, E-2, and Figure E-1 of 40 CFR Part 58 Appendix E showing the minimum distances between a sampling inlet and nearby roadways for neighborhood scale monitoring based on traffic counts at the San Jose air monitoring station. In all cases, the roadway distance from the monitors exceeds the minimum distance required. SO_2 and lead have minimum distance requirements that are based on emission sources, none of which are located near the San Jose site.

Table A-2. Spacing from roadways analysis for neighborhood scales.

Roadway	ADT (year of count)	Distance from site (meters)	Minimum Distance Required (meters)			
			Ozone Table E-1	NO/NO_y Table E-1	CO Table E-2	PM Figure E-1
Jackson Street	3,990 (2007)	15.1	14	10	10	15
4th Street	6,000 (2007)	34.7	16	10	10	15
I-101 & Oakland Rd	178,000 (2007)	1650	250	250	150	178
I-280 & 1st St.	153,890 (2007)	2670	250	250	150	154
I-880 & North 1st St.	149,000 (2007)	1550	250	250	150	149
Guadalupe Parkway & Taylor St.	88,000 (2007)	847	168	168	150	88

Height of Sampling Inlets

40 CFR Part 58 Appendix E specifies that ambient air pollutant concentrations for neighborhood and larger scale monitoring must be measured between 2 and 15 meters above ground level. This layer of air is typically well mixed and representative of ambient pollutant concentration exposure for the general population. The roof of the two-story San Jose monitoring station has two levels, one approximately 7.5 meters above the ground level, and a second level 1.3 meters lower. All sample inlets are above the roof levels at heights indicated in Tables A-3. All current and proposed sample inlets for the San Jose station are between 9.0 and 12.0 meters above ground level and meet regulatory requirements.

Table A-3. NCore monitor sample inlet heights.

Monitor Type	Monitor Status	Monitor sample inlet height above ground level
CO, NO_x, O_3, and SO_2 gasses	Current	11.9 meters
FRM $PM_{2.5}$	Current	9.0 meters
BAM $PM_{2.5}$	Current	9.8 meters
$PM_{2.5}$ Speciation	Current	8.9 meters
Total Reactive Nitrogen (NO_y)	Proposed	approximately 12.0 meters
$PM_{10-2.5}$ and $PM_{10-2.5}$ speciation	Proposed	approximately 9.0 meters

Spacing from Trees and Obstructions

40 CFR Part 58 Appendix E, Section 5.0 requires that the probe be at least 10 meters from the nearest tree drip line. There are four nearby trees, but only one is close to the station and it is 11 meters to the closest sampler inlet.

For obstructions on the roof, 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. There are no obstructions on the roof.

For obstructions not on the roof, 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. Obstructions include both buildings and trees taller than the probe or monitor inlet. Table A-4 below is a summary of spacing from nearby trees and obstructions not on the roof. The minimum spacing required in the last column of the table is based on the probe inlet height of 11.9 meters above the ground, and the lowest particulate sampler inlet height at 8.9 meters above the ground. The table shows that in all cases, actual distances between the object and sampling inlets are greater than the minimum spacing requirements.

Table A-4. Spacing from obstructions (not on roof) and trees

Object	Height of object (AGL)	Actual distance between object and closest inlet	Minimum spacing required based on object height in meters (m)
Yu Ai Kai Senior Center	14 meters	17.3 meters	Gaseous probe - 4.2 m Nearest sampler -11.4 m
Deciduous tree to the South	13 meters	from drip line, 11 meters	Gaseous probe - 2.2 m Nearest sampler - 9.4 m
Redwood tree to the southeast	17 meters	from drip line, 75 meters	Gaseous probe - 10.2 m Nearest sampler -17.4 m
Redwood tree to the north	15.3 meters	from drip line, 71 meters	Gaseous probe – 6.8 m Nearest sampler -14.0 m
Redwood tree to the northwest	13 meters	from drip line, 56 meters	Gaseous probe - 2.2 m Nearest sampler - 9.4 m

NCore Monitors

The first column of Tables A-5 and A-6 lists the monitor types required for NCore stations. Table A-5 lists the monitors currently operating at the San Jose station, and Table A-6 lists the proposed monitors to be added for NCore. The tables also list the sampling methodology, sampling frequency and spatial scale for current and proposed measurements required for NCore sites in 40 CFR Part 58 Appendix D Section3(b). Proposed monitors will be installed prior to the official NCore start date of January 1, 2011.

Table A-5. Current NCore Monitors

Monitor Type	Sampling Method	Sampling Frequency	Spatial Scale
Carbon Monoxide (CO)	TECO 48i TLE	Continuously	Neighborhood
Nitrogen Oxide (NO_x)	TECO 42C	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	Apr-Sep: 1/3 days Oct-Mar: Daily	Neighborhood
BAM $PM_{2.5}$	Met One Model 1020	Continuously	Neighborhood
$PM_{2.5}$ Speciation	Met One SASS	1/3 days	Neighborhood

Table A-6. Proposed NCore Monitors.

Monitor Type	Sampling Method	Sampling Frequency	Status as of June 1, 2009
Total Reactive Nitrogen (NO_y)	TECO 42i TL	Continuously	Will request waiver to substitute high-sensitivity NOx.
$PM_{10-2.5}$ and $PM_{10-2.5}$ speciation	EPA-approved sampling method will not be fully developed before the 01/01/2011 start date	1/3 days	Will implement when EPA-approved sampling method is fully developed.
Meteorological	Air quality measurements approved instrumentation for wind speed, wind direction, humidity, barometric pressure, temperature, rainfall, and solar radiation	Continuously	EPA approved a waiver for 10-meter tower on-site, though siting criteria are not fully met. Will be operational within 18 months.

Project Quality Assurance

All instruments will be operated in accordance with manufacturer's recommendations, 40 CFR 58 Appendix A requirements, and Technical Services SOPs included within the respective Program QAPPs. After data are collected, reviewed and validated, they will be submitted to AQS within 90 days of the end of each quarter. After AQS submission, summary reports will be generated quarterly and reviewed by the Program managers and the QA Officer before final certification to EPA.

Site Photographs

Figures A-4 through A-6 are photographs of the San Jose NCore monitoring station. Figures A-4 and A-5 show street-level views of the station located on the second floor with the sampling mast on the roof. Figure A-6 shows the rooftop sampling equipment at the site with the gaseous sampling mast shown in the center of each picture. All equipment pictures are taken 45° apart and referenced to True North. The downtown San Jose street grid is oriented 28° to the west of True North, so all pictures show the building at this angle.

Figure A-4. View of the San Jose monitoring station looking south.

Figure A-5. View of the San Jose monitoring station looking north.

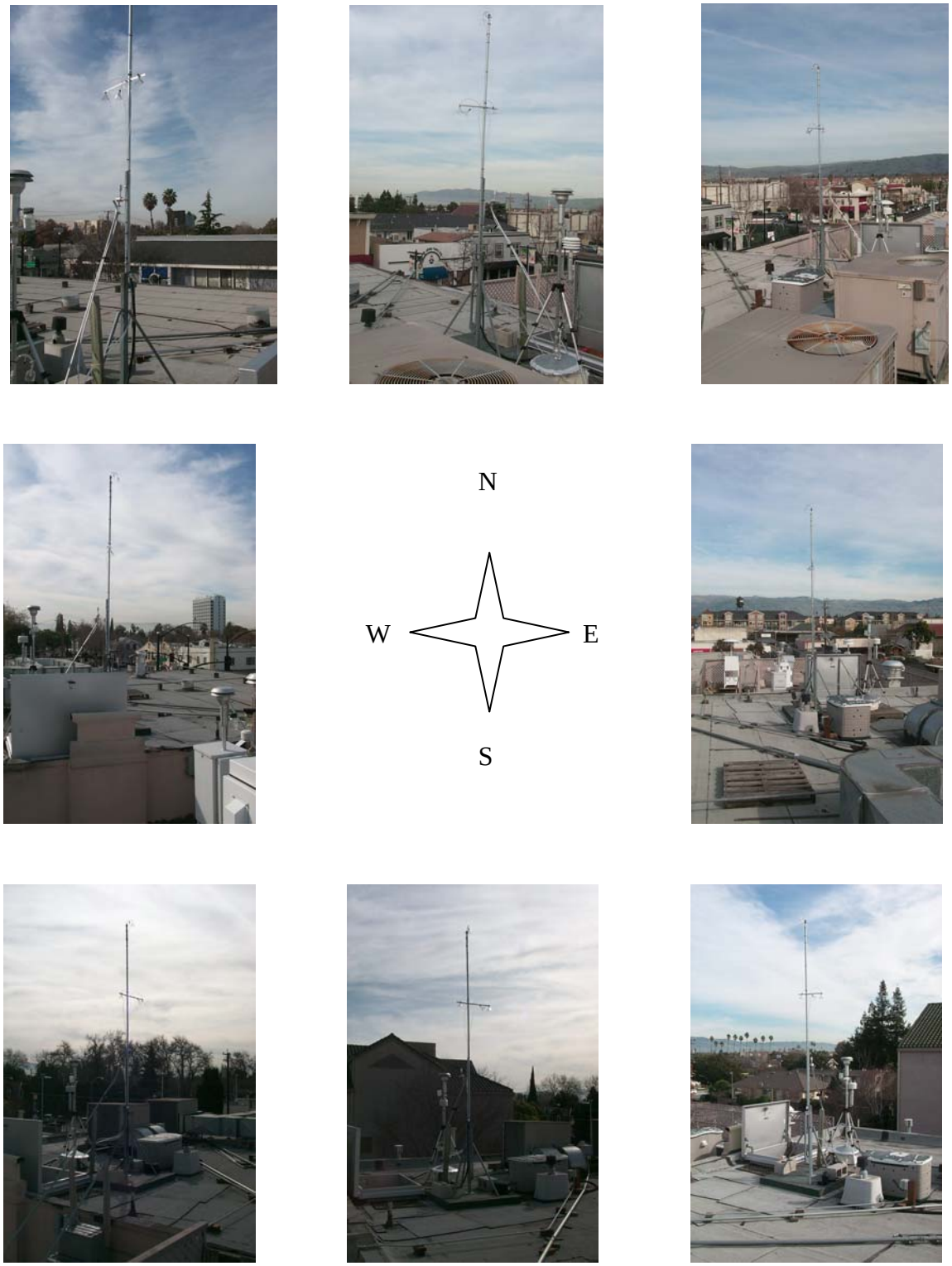


Figure A-6. Photographs of the rooftop sampling equipment at San Jose.