



**Annual Monitoring Network Report
for
Small Districts in California**

Volume I

June 2008

**ANNUAL MONITORING NETWORK REPORT
for
SMALL DISTRICTS IN CALIFORNIA**

**Planning and Technical Support Division
Air Quality Data Branch
California Air Resources Board**

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Section 1. Purposes, scope, and organization of report

In California, there are more than 250 locations where the ambient air quality is routinely measured for gaseous and particulate air pollutants. The measured data form a backbone for air quality management programs, provide the public with information on the status of the air quality and the progress in improving air quality, and are used by health researchers, business interests, environmental groups, and others.

This report describes the network of ambient air quality monitors in parts of California. The report meets requirements for an annual network plan as listed in Title 40, Part 58, Section 10 of the Code of Federal Regulations (40 CFR 58.10). The language of 40 CFR 58.10 is included in Appendix A. The regulations require that the report be submitted to the U.S. Environmental Protection Agency (U.S. EPA) by July 1 of each year.

Fourteen local air agencies in California that operate monitoring sites are reporting separately on the ambient monitoring within their jurisdictions. The geographical scope of this volume consists of 19 counties or portions of counties with ambient monitoring sites for which the local air agencies are not drafting a separate report. Table 1 lists the local agencies that are drafting their own reports and those whose monitoring is included in this report. Figure 1 shows the areas covered by this report and the locations of the included monitoring sites. Table 3 in Section 3 of this volume lists the monitoring sites that are fully covered in this report.

As required by the regulations, this report includes monitors which are federal reference methods (FRM) or federal equivalent methods (FEM) and operated by air agencies. While the CFR also requires reporting of monitoring conducted by yet another category of monitoring methods, there are no plans to operate monitors of this type in California. The terms FRM and FEM denote monitoring instruments that can produce measurements of the ambient levels (or concentrations) that the regulations allow to be compared to the ambient air quality standards for regulatory purposes.

Given the interest in fine particulate matter, i.e., PM_{2.5}, this report also includes information regarding routine monitoring by PM_{2.5} continuous monitoring and PM_{2.5} speciation monitoring. None of air monitoring agencies in the 19 counties or portions of counties referred to above are currently using FRMs or FEMs to routinely collect PM_{2.5} continuous or speciation data.

This report consists of two volumes. Volume 2 is an update of an annual report that the Air Resources Board (ARB) has been compiling and distributing for more than two decades. Volume 2 retains its title of State and Local Air Monitoring Network Plan. By coincidence, Volume 2 includes some but not all of the information required by the CFR for the annual plan. The information required by the CFR that is not included in Volume 2 is included in this volume of the report, i.e., Volume 1. Furthermore, Volume 1 covers the monitoring in the limited parts of the State described in the text above and in Table 1 and Figure 1 of Volume 1, while Volume 2 covers the entire State. Volume 1 is available on the internet at www.arb.ca.gov/aqd/amnr/amnr.htm, while Volume 2 is available at www.arb.ca.gov/aqd/netrpt/netrpt.htm.

Table 1

Agencies Drafting Annual Network Plans

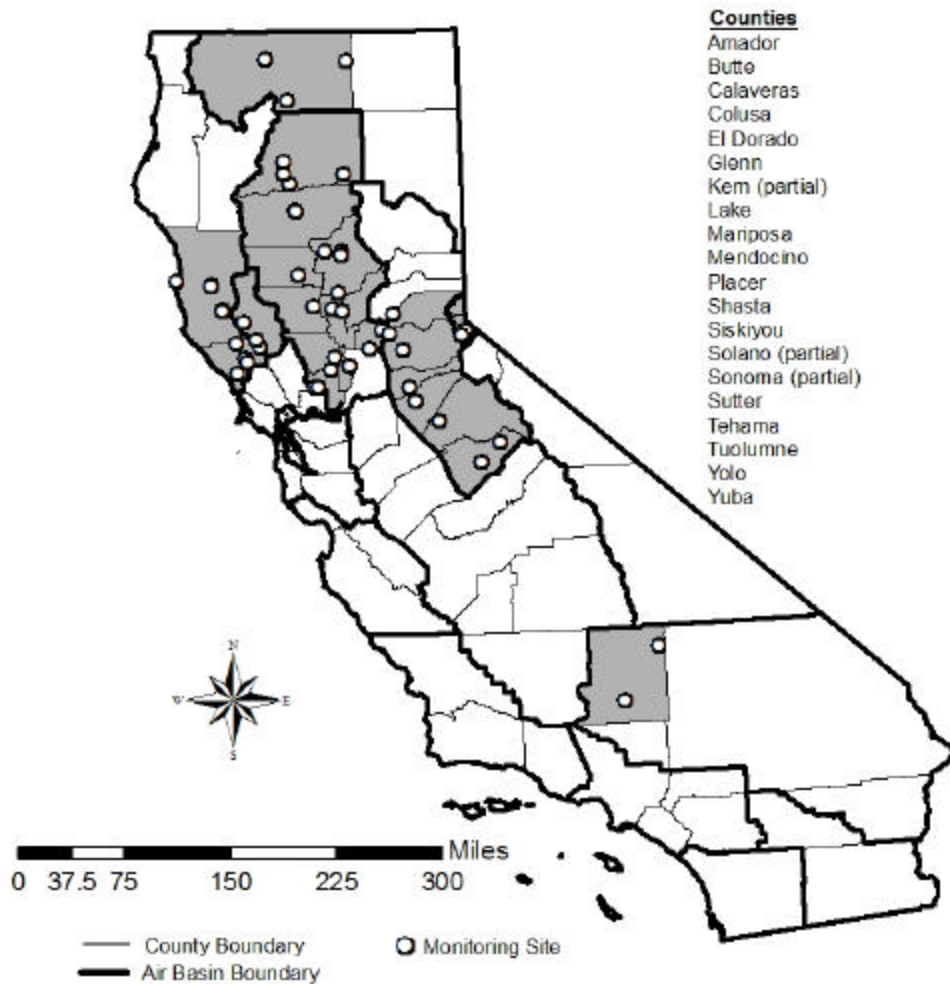
Air districts drafting their own Annual Network Plans	Air districts that are included in this ARB report
Great Basin Unified APCD Imperial County APCD Mojave Desert AQMD Monterey Bay Unified APCD North Coast Unified AQMD Northern Sierra AQMD Sacramento Metropolitan AQMD San Diego County APCD San Francisco Bay Area AQMD San Joaquin Valley Unified APCD San Luis Obispo County APCD Santa Barbara County APCD South Coast AQMD Ventura County APCD	Amador County APCD Butte County AQMD Calaveras County APCD Colusa County APCD El Dorado County AQMD Feather River AQMD Glenn County APCD Kern County APCD Lake County AQMD Mariposa County APCD Mendocino County AQMD Modoc County APCD Northern Sonoma County APCD Placer County APCD Shasta County AQMD Siskiyou County APCD Tehama County APCD Tuolumne County APCD Yolo-Solano AQMD

Notes: APCD stands for Air Pollution Control District
 AQMD stands for Air Quality Management District

The next table, i.e., Table 2, lists the elements required in 40 CFR 58.10 to be in the network plan. Also listed is the location(s) within the report that includes information on each required element.

In compiling this report, ARB solicited input from and review by the local air districts whose jurisdictions are included. Also, the report was available for a 30 day public inspection period prior to its submittal to the U.S. EPA.

Figure 1
Counties and Monitoring Sites in this Report



Metropolitan statistical areas

Certain requirements in 40 CFR 58 are based on metropolitan statistical areas (MSAs). MSAs are part of a classification of geographical regions developed by the U.S. Census Bureau. An MSA may include one or more counties. However, not all counties are within an MSA.

Table 2

Location of Information Required for Annual Network Plan

Elements required by 40 CFR 58.10	Location in Annual Network Plan
Monitoring purpose information	Vol. 1, Section 3
Evidence that siting and operation criteria are met Appendix A Appendix C Appendix D Appendix E	Vol. 1, Section 5 Vol. 1, Section 5 Vol. 1, Section 4 Vol. 1, Section 5
Air Quality System Site Identification Number (AQS Site ID)	Vol. 1, Section 3, Table 3 Vol. 2, Tables 1 and 2
Location of sites Street address Geographic coordinates	Vol. 1, Section 3, Table 3 Vol. 2, Table 2
Sampling and analysis methods of monitors	Vol. 2, Table 2
Operating schedules for monitors	Vol. 1, Section 6
Proposals to move/remove stations	Vol. 1, Section 8
Monitoring objectives and spatial scale	Vol. 2, Table 2
Sites suitable or not for comparison to the annual PM2.5 National Ambient Air Quality Standard (NAAQS)	Vol. 1, Section 7.1
Metropolitan Statistical Area (MSA) information	Vol. 1, Section 3, Table 3
Review of changes to PM2.5 Network	Vol. 1, Section 7.2

Section 2. General information about the monitoring network

California's ambient air monitoring network is one of the most extensive in the world, consisting of over 250 sites where air pollution levels are monitored and more than 700 monitors used to measure the pollutant levels. The monitoring network needs to be large to cover the diverse range of topography, meteorology, emissions, and air quality in California, while adequately representing a large population. The monitoring network is critical in assessing the State's clean air progress and in determining pollutant exposures in California.

The network of monitoring sites for a pollutant tends to be denser where the air quality problem is worse and where the population is greater. The monitoring network also strives to provide representative data to all the broad geographical areas in California, including the coastal areas, the interior valleys, the desert regions, and the mountainous areas. Monitoring is also conducted in Mexico, across the border from San Diego and Calexico.

Some of the monitoring is operated by ARB, much of it is operated by local air quality districts, and a small amount is operated by other entities including the National Park Service, private contractors, and tribal authorities.

Ambient concentration data is collected for a wide variety of pollutants. The most important of these are usually thought of as being ozone (O₃), fine particulate matter of a size of 2.5 micrometers or less (PM_{2.5}), particulate matter of a size of 10 micrometers or less (PM₁₀), and a number of toxic compounds. Monitoring for meteorological parameters is also conducted at a number of sites. One way or another, data for all of the pollutants is needed to better understand the nature of the ambient air quality problems in California, as well as to inform the public regarding where the air quality is poor and where it is clean.

Not all pollutants are monitored at all sites. While most sites monitor for multiple pollutants and some sites collect data for many pollutants, other sites monitor for only one or two pollutants. The State and local air quality agencies in California make the effort to only collect data from each site that is needed.

The needs for the monitoring data are varied. A sense of this can be gathered from the information on monitoring purposes in the next section of this volume of the report.

A fundamental purpose of monitoring is to distinguish between areas where pollutant levels exceed the ambient air quality standards and areas where the standards are not exceeded. Health-based ambient air standards are set at levels of pollutant concentration that result in adverse impacts to human health. Evidence of a standard being exceeded in an area leads to efforts to reduce the sources of pollution that result in the exceedances. In other words, air quality

agencies develop strategies and regulations to achieve needed emission reductions. Data from the ambient monitoring network are then used to indicate the success of this, in terms of the rate of progress towards attaining the standards or to show that standards have been attained. So there is a feedback process between the emission reduction programs and the monitoring programs.

Section 9 of this volume includes references to more information on California monitoring networks.

Section 3. Purposes served by the monitors

The data from a network of air quality monitors serves many purposes that benefit a number of groups of society in different ways. The data are useful to health researchers, the general public, regulatory agency staff, environmentalists, business interests, and others. For example, the measurements of pollutant concentrations that come from the air quality monitors in the network are used: to determine compliance with ambient air quality standards; as the basis of daily reports to the public in newspapers and on TV; and in determining the levels of pollution above which there are significant adverse health effects. Each monitor in the network serves at least one purpose and most of the monitors serve multiple purposes.

By their nature, some of the purposes are met by a limited number of monitors, e.g., the purpose of monitoring for the highest concentrations of a pollutant in an area. Other purposes are general in nature, e.g., most all monitors can be said to be useful for public reporting of the ambient air quality in the vicinity of the monitor and for providing spatial representation of air quality in the sub-regions of a larger region. And yet other purposes are more ad hoc in nature in that the purpose may be served infrequently, such as for a special study on health consequences or for air quality modeling of an episode of particularly bad air quality.

Some purposes may, in one context, be said to apply to almost all monitoring for a pollutant and in another context be thought of as more selectively applying to a small subset of the monitors. Take the purpose of determining compliance with the ambient air quality standards. The State does this in determining if an area is in attainment or non-attainment of California Ambient Air Quality Standards. In this process of “State designations”, the data from all monitors in an area can be looked at but only the data from a small number of monitors with the highest concentrations will drive the determination of the designation for the area. So as used in this report, a smaller number of monitors are given the “State designation” purpose.

A list of purposes along with short descriptions is included below. After that, a table (Table 3) lists the purposes served by each monitor included in the scope of this report. In Table 3, codes for the monitoring purposes are listed for each monitor. These codes are defined at the end of Table 3. Note that although the “general” purposes apply to most if not all of the monitors, the code for the general purposes only appears if those purposes are the most important purposes for the monitor. Also, no effort was made to indicate whether any monitors are serving ad hoc purposes at this time. Such conditions can change quickly.

Note that Table 2 of Volume 2 of this report lists the “monitoring objectives” of the monitors, and that this is different than how the term “monitoring purposes” is

used in this report. The CFR requires that the monitoring objectives be listed in this annual network report. These monitoring objectives are the federal monitoring objectives as defined by the U.S. EPA. These do not include a number of additional State and local monitoring objectives. This section of the report lists the broader purposes served by the monitors, including the State, local, and federal purposes for monitoring. The federal monitoring objectives are a subset of this broader list of monitoring purposes.

Also listed in Table 3 are the locations of the monitors, including the MSAs (see Metropolitan statistical areas at the end of Section 1 of this volume). In Table 3, the appropriate MSA for an area is listed after the county name.

List of purposes with descriptions

Agricultural Burning refers to the intentional use of fire for vegetation management, both in agricultural settings, such as fields and orchards, as well as in wildlands, including rangeland and forests to improve land for wildlife and game habitat or as a tool for disease or pest prevention. Monitors with this purpose are used to assess when and where burning can occur.

Background Level monitoring is use to determine general background levels of air pollutants. Background concentrations vary between different air pollutants.

Expected High Concentration monitoring is done at sites to measure pollutant concentrations in areas where air pollution is expected to be at its highest in an area. The state designation criteria contain the requirement for this type of monitoring in order to show that an area attains the air quality health standards.

The *Geyser Air Monitoring Program (GAMP)* was established to monitor ambient air quality in geothermal areas, mainly monitoring for hydrogen sulfide.

High Concentration monitoring is done at sites to determine the highest concentration of an air pollutant in an area within the monitoring network. A monitoring network may have multiple high concentration sites, e.g., due to varying meteorology year to year. This is a purpose listed by the U.S. EPA.

Pollutant Transport is the movement of pollutant between air basins or regions. Transport monitoring is use to assess and mitigate upwind areas when transported pollutant affects neighboring downwind areas. Also, transport monitoring is use to determine the extent of regional pollutant transport among populated areas and to agricultural and wildland areas.

Population Exposure monitoring is done to represent the air pollutant concentrations a populated area is exposed to.

Public Reporting means providing air quality data to the general public in a timely manner. Data can be presented in a number of ways which includes newspapers and TV, internet web pages, air quality maps, and hardcopies.

Representative Concentration monitoring is done at sites with pollutant concentrations that represent the air quality concentrations for a pollutant expected to be similar throughout a geographical area. These sites do not necessarily indicate the highest concentrations in the area for a particular pollutant.

Residential Burning or Backyard Burning is the open burning of yard wastes by household residents. Backyard burning includes dry weeds, plant pruning, shrubbery, tree trimmings, and branches. Data from monitors with this purpose help guide decisions regarding appropriate times to allow residential burning.

Spatial/Geographical Representation means locating a site to represent a geographical region with common topography and meteorology. This type of monitoring is practically the same as Representative Concentration monitoring.

Source Impact monitoring is used to determine the impact of significant sources or source categories of air quality emissions on ambient air quality. The air pollutant sources may be stationary or mobile.

State Area Designation is the process used to determine compliance with the State ambient air quality standards for a particular pollutant. The State does this by monitoring the ambient air quality of an area and determining if the area is in attainment or non-attainment of the California Ambient Air Quality Standards. In this process of State area designations, the data from all monitors in an area can be looked at, but only the data from a small number of monitors with the highest concentrations will determine the designation of the area.

State Implementation Plan (SIP) Maintenance Requirement is part of the comprehensive SIP strategy designed to attain federal air quality standards as quickly as possible through a combination of technologically feasible, cost-effective, and far reaching measures. The SIP is a plan prepared by States and submitted to the U.S. EPA describing how each area will attain and maintain national ambient air quality standards. Once an area attains a national ambient air quality standard, the area is required to show and maintain that status, which requires continued monitoring in the area.

Trend Analysis monitoring is useful for comparing and analyzing air pollution concentrations over time and distance. Usually, trend analyses show the progress or lack of progress in improving air quality for an area over a period of years. Some sites are more useful than others for trend analyses. For example, it is better to have a history of monitoring at a site that includes the full time period of a trend analysis.

Welfare Effects monitoring is used to measure air pollution impacts on visibility, vegetation damage, or other welfare-based impacts.

Table 3
Monitoring Purposes
(Monitoring active during 2007 - 2008)

Station/Address	AQS Site #	OZONE	CO	NO2	SO2	PM2.5*	PM10*
LAKE COUNTY AIR BASIN							
Lake County N/A**							
Anderson Springs 11270 Anderson Road, Anderson Springs	060333010						Gnrl/GAMP
Glenbrook-High Valley Road 8276 High Valley Road, Glenbrook	060333011						Gnrl/GAMP
Lakeport-Lakeport Blvd 905 Lakeport Blvd, Lakeport	060333001	Gnrl/StateD				Gnrl/StateD	Gnrl/StateD
LAKE TAHOE AIR BASIN							
El Dorado County Sacramento-Arden-Arcade-Roseville MSA							
South Lake Tahoe-Airport 1901 Airport Road, South Lake Tahoe	060170013	StateD					
South Lake Tahoe-Sandy Way 3337 Sandy Way, South Lake Tahoe	060170011						CONT
MOJAVE DESERT AIR BASIN							
Kern County Bakersfield MSA							
Mojave-923 Poole Street 923 Poole Street, Mojave	060290011	HConc/StateD SIPMain/Trans				StateD/RConc	StateD
Ridgecrest-100 West California Avenue 100 West California Avenue, Ridgecrest	060290015					StateD/RConc	StateD/RConc SIPMain
MOUNTAIN COUNTIES AIR BASIN							
Amador County N/A							
Jackson-Clinton Road 201 Clinton Road, Jackson	060050002	StateD/Trans SIPMain					
Calaveras County N/A							
San Andreas-Gold Strike Road 501 Gold Strike Road, San Andreas	060090001	HConc/StateD SIPMain				Gnrl	Gnrl
El Dorado County Sacramento-Arden-Arcade-Roseville MSA							
Cool-Highway 193 1400 American River Trail, Cool	060170020	EHConc/HConc SIPMain					
Placerville-Gold Nugget Way 3111 Gold Nugget Way, Placerville	060170010	StateD/Trans					Gnrl/StateD
Mariposa County N/A							
Jerseydale-6440 Jerseydale 6440 Jerseydale Road, Jerseydale	060430006	StateD/Trans SIPMain					
Yosemite National Park-Turtleback Dome	060430003	StateD/HConc Trans	Gnrl	Gnrl			
Yosemite Village-Visitor Center	060431001					CONT	Gnrl/StateD
Placer County Sacramento-Arden-Arcade-Roseville MSA							
Colfax-City Hall 33 South Main Street, Colfax	060610004	Gnrl/StateD					
Tuolumne County N/A							
Sonora-Barretta Street 251 South Barretta Street, Sonora	061090005	Gnrl/StateD Trans					

Table 3 (Cont.)

Monitoring Purposes
(Monitoring active during 2007 - 2008)

Station/Address	AQS Site #	OZONE	CO	NO2	SO2	PM2.5*	PM10*
NORTH COAST AIR BASIN							
Mendocino County N/A							
Fort Bragg-North Franklin Street 416 North Franklin Street, Fort Bragg	060450002						Gnrl/StateD AgBn/ResBn
Ukiah-County Library 105 North Main Street, Ukiah	060450006					Gnrl/StateD	StateD AgBn/ResBn
Ukiah-East Gobbi Street 306 East Gobbi Street, Ukiah	060450008	Trans/StateD	Gnrl	Gnrl			
Willits-899 South Main Street 899 South Main Street, Willits	060450009	Trans	Gnrl	Gnrl			
Willits-Firehouse 74 East Commercial Street, Willits	060452001						StateD AgBn/ResBn
Sonoma County Santa Rosa-Petaluma MSA							
Colverdale 100 Washington Street, Colverdale	060970001						AgBn/ResBn
Guerneville-Church and 1st 16255 1st Street, Guerneville	060973002						AgBn/ResBn
Healdsburg-133 Matheson Street 133 Matheson Street, Healdsburg	060970002						Gnrl AgBn/ResBn
Healdsburg-Municipal Airport 200a Heidelberg Way, Healdsburg	060971003	Gnrl/StateD					
NORTHEAST PLATEAU AIR BASIN							
Siskiyou County N/A							
Lava Beds National Monument P.O. Box 867, Lava Beds	060930005						Gnrl/StateD AgBn
Mount Shasta-N Old Stage Road 3 North Old Stage Road, Mount Shasta	060930004						Gnrl/AgBn
Yreka-Foothill Drive 528 Foothill Drive, Yreka	060932001	Gnrl/StateD Trans				Gnrl	Gnrl/StateD AgBn
SACRAMENTO VALLEY AIR BASIN							
Butte County Chico MSA							
Chico-Manzanita Avenue 468 Manzanita Avenue, Chico	060070002	Gnrl/StateD AgBn	Gnrl	Gnrl		Gnrl/StateD CONT/SPEC	Gnrl/StateD AgBn
Gridley-Cowee Avenue 608 Cowee Avenue, Gridley	060074001					CONT	
Paradise-4405 Airport Road 4405 Airport Road, Paradise	060070007	StateD/AgBn Trans/HConc SIPMain					AgBn/ResBn
Paradise-Fire Station #1 767 Birch Street, Paradise	060072001						
Colusa County N/A							
Colusa-Sunrise Blvd 100 Sunrise Blvd, Colusa	060111002	Gnrl/StateD AgBn				Gnrl CONT	Gnrl/StateD AgBn
Glenn County N/A							
Willows-E Laurel Street 720 N Colusa Street, Willows	060210003	Gnrl/StateD AgBn				CONT	StateD/AgBn

Table 3 (Cont.)

Monitoring Purposes (Monitoring active during 2007 - 2008)

Station/Address	AQS Site #	OZONE	CO	NO2	SO2	PM2.5*	PM10*
Placer County Sacramento-Arden-Arcade-Roseville MSA							
Auburn-Dewitt-C Avenue 108 C Avenue, Auburn	060610002	StateD					
Roseville-N Sunrise Blvd 151 N Sunrise Blvd, Roseville	060610006	StateD/AgBn		Gnrl		Gnrl/StateD CONT	StateD/AgBn
Shasta County Redding MSA							
Anderson-North Street 2220 North Street, Anderson	060890007	StateD				CONT*** ResBn	StateD
Lassen Volcanic Natl Park-Manzanita Lake	060893003	Gnrl/Bkgnd Trans					
Redding-Health Department Roof 2630 Hospital Lane, Redding	060890004	Gnrl/StateD				Gnrl	Gnrl/StateD
Shasta Lake-4066 La Mesa Avenue 4066 La Mesa Avenue, Shasta Lake	060890008	Gnrl***					Gnrl
Solano County Vallejo-Fairfield MSA							
Vacaville-Merchant Street 650 Merchant Street, Vacaville	060953001						Gnrl
Vacaville-Ulatis Drive 2012 Ulatis Drive, Vacaville	060953003	StateD/Trans				CONT	
Sutter County Yuba City MSA							
Sutter Buttes-S Buttes	061010004	HConc/Trans StateD/AgBn					
Yuba City-Almond Street 773 Almond Street, Yuba City	061010003	Gnrl/StateD AgBn		Gnrl		Gnrl CONT	Gnrl/StateD
Tehama County N/A							
Red Bluff-Oak Street 502 Oak Street, Red Bluff	061030005	Gnrl/StateD					
Red Bluff-Messer Drive 700 Messer Drive, Red Bluff	061030002						Gnrl/StateD
Tuscan Butte	061030004	Gnrl/StateD Trans					
Yolo County Sacramento-Arden-Arcade-Roseville MSA							
Davis-UCD Campus	061130004	AgBn/StateD		Gnrl		CONT	
West Sacramento-15th Street 132 15th Street, West Sacramento	061132001						StateD
Woodland-Gibson Road 41929 E Gibson Road, Woodland	061131003	StateD				Gnrl/StateD CONT	AgBn/StateD

Lead monitors are not included in this list because lead concentrations are far below the health-based standards in these areas.

* CONT or SPEC in a PM column denotes that a continuous PM monitor or speciation monitor is located at the site.

Continuous PM monitoring provides realtime hourly concentration values. This is useful for public reporting, better understanding of episodes of high PM concentrations, identification of sources of pollutants, possible allowance for less frequent filter sampling, etc.

** After a county name, the table lists the U.S. Census Bureau's Metropolitan Statistical Area (MSA) that includes the county.

*** Monitors for which the data are not being submitted to ARB or U.S. EPA.

Table 3 (cont.)

Codes for Monitoring Purposes

Federal monitoring purposes

HConc	High concentrations
RConc	Representative concentrations
Sourc	Source impact
Bkgnd	Background levels
Trans	Pollutant transport
Welfr	Welfare effects

State and local purposes (the above purposes plus these below)

EHConc	Monitoring at expected high concentration sites relative to California Ambient Air Quality Standards
AgBn	Support agricultural/prescribed burn decisions
ResBn	Support residential burn program
Trnds	Trends analysis
StateD	Support State area designation
SIPMain	State Implementation Plan (SIP) maintenance requirement
GAMP	Geyser Air Monitoring Program

The following purposes apply in a general sense to monitors throughout the network. For these, we use the code "Gnrl" in the table above. We list this code for a monitor when these purposes are some of the predominant purposes for the monitor.

Gnrl	Population exposure/population representation Spatial representation/spatial coverage (geographical representation) Public reporting
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Most monitors are also considered to be of potential use for purposes such as: evaluation of emissions inventories, model validation, and source/pollutant relationships. These purposes are not separately listed in the above table.

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Section 4. Monitoring required by the U.S. EPA

U.S. EPA regulations specify the minimum number of sites at which State and local air agencies must deploy monitors. In practice, the State and local agencies find they need to deploy significantly more monitors. The additional monitors are needed to fulfill State and local purposes for monitoring that are in addition to the federal purposes. For example, because State air quality standards tend to be more stringent than national standards, some areas may need more monitors than needed to only show compliance with the national standards. Another example comes from the expectation from the public to be informed of the actual air quality conditions where they live and work. This objective is not explicitly built into the federal regulatory requirements. State and local air agencies in California attempt to be responsive to the public in this regard.

For the pollutants that most frequently exceed the ambient standards, the number of monitors required in California by the new regulations is a dramatic increase over the number required by the replaced regulations. The requirements for numbers of monitors appear in Appendix D of Part 58 of the CFR. For ozone, PM_{2.5}, and PM₁₀, the required minimum number is based on the population of an area and the severity of the air quality for the pollutant in the area. For other pollutants, no monitoring is required unless an area exceeds or is close to exceeding a national ambient air quality standard, which is true for very few if any areas in the U.S. For purposes of the minimum requirements, the areas are defined by the metropolitan statistical areas (MSAs) developed by the U.S. Census Bureau (see [Metropolitan statistical areas](#) at the end of Section 1 of this volume).

For the parts of the State included in this report, Table 4 lists information on the number of existing ozone, PM_{2.5}, and PM₁₀ monitors and the number required by Appendix D. In all cases, sufficient monitoring exists. The information is listed by MSA. The number of required monitors is based on the population of the MSA, taken from the 2000 U.S. Census, in combination with the degree to which air quality in the MSA is greater or less than the national air quality standards.

Monitoring for carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead (Pb) is not currently required anywhere in California in order to comply with the Appendix D requirements of the CFR. Ambient concentrations for these pollutants do not exceed the national air quality standards and do not trigger requirements for monitoring. As required by a different part of 40 CFR 58 that takes effect in a couple years, a few sites in major urban areas in California will include monitoring for these pollutants. Even without federal requirements, dozens of sites in California monitor for CO and NO₂.

Table 4

Numbers of Required and Existing Sites by Metropolitan Statistical Area (MSA)
(MSAs that include the small air districts included in this report)

Metropolitan Statistical Area (MSA)	Pop.	Ozone		PM2.5				PM10 (SSI) ³	
		Required	Existing	Required FRM ¹	Existing FRM	Required Cont. ²	Existing Cont.	Required	Existing
Bakersfield*	661,645	2	8	2	5	1	1	2	5
Chico	203,171	1	2	1	1	1	2	0	2
Redding	163,256	1	3	0	1	0	0	0	3
Sacramento-Arden Arcade-Roseville*	1,796,857	2	15	3	5	2	7	4	10
Santa Rosa- Petaluma*	458,614	1	2	0	1	0	0	0	4
Vallejo-Fairfield*	394,542	2	4	1	1	1	2	0	3
Yuba City	139,149	1	2	1	1	1	1	0	1

Notes:

2004-2006 air quality data was used in determining the number of required sites.

Population is based on year 2000 Census data.

* Parts of these MSAs are included in the geographical scope of this report, and parts are within the geographical scope of the reports being completed by the districts. The number of sites listed are for the entire MSA.

¹ FRM: Federal Reference Method

² Cont.: Refers to a continuous PM2.5 monitor, i.e., one that measures hourly data.

³ SSI: Size Selective Inlet. The SSI is an FRM for PM10.

Section 5. Required quality assurance of the monitoring program

The information below, along with the information available via the web link below, provides information on the status of compliance with the requirements of 40 CFR 58 Appendices A, C, and E. The annual network plan is required to include such information.

Annually, the Quality Assurance Section (QAS) of ARB conducts performance evaluations (audits) for each sulfur dioxide, nitrogen dioxide, ozone, and carbon monoxide analyzer with National Institute of Standards and Technology (NIST) traceable gases. Each analyzer is audited at three levels using known concentrations of gases. Annual PM monitor flow rate audits are conducted with a BGI (Bob Gussman Incorporated) variable orifice mass flow meter, or BGI DeltaCal, which are certified against NIST traceable primary standards. Semi-annual flow rate audits for PM monitors are required. QAS conducts one annual PM flow rate audit and U.S. EPA Region 9 conducts the second PM flow rate audit.

Ozone audits are performed using ozone transfer standards that are certified quarterly by comparing the transfer standard to a NIST Standard Reference Photometer. Laboratory audits for the toxics program are conducted using certified gases and/or materials. Meteorological audits are conducted with instruments that are NIST traceable and/or manufacturer-certified. All of the audits performed by QAS are conducted in accordance with the 40 CFR 58, Appendix A.

As part of the annual audit at each air monitoring station, QAS conducts siting evaluations. Physical measurements and observations, including probe/sensor height above ground level, distance from trees, type of ground cover, residence time, obstructions to air flow, and distance to local sources, topography, vehicle counts, predominant wind direction, probe material, etc., are taken to determine compliance with 40 CFR Part 58, Appendix E requirements.

QAS also ensures the quality of the data collected by the air monitoring sites operating in California through analysis of precision data submitted to the U.S. EPA's ambient air quality database, the Air Quality System (AQS). On a quarterly basis, staff reviews the frequency of flow rate verifications for manual PM samplers and automated PM analyzers, and the frequency of one-point quality control checks for gaseous instruments. Annually, staff performs an analysis of precision data that concentrates on three parameters: precision data submission, precision data validity, and precision data usability. The data analyses are conducted in accordance with 40 CFR 58, Appendix A.

In addition, QAS conducts system audits in collaboration with other ARB divisions to determine if a district's air monitoring program satisfies the

requirements of 40 CFR Part 58 and U.S. EPA's Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, April 1994. Compliance with these regulations is necessary if the data are to be considered data-for-record per the California Code of Regulations (Title 17, Article 3, section 70301). Data meeting these requirements are eligible to be used in actions taken pursuant to the Federal Clean Air Act and the California Clean Air Act.

Information about each air monitoring station audited by QAS is available at <http://www.arb.ca.gov/qaweb/site.php>. This web page includes maps of each site, latitude and longitude coordinates as determined by GPS, site photos, precision and accuracy data, and a detailed site survey of the physical parameters and conditions at each site. This site also includes an area for district precision and accuracy reports. These reports are available on a limited basis to district staff.

Appendix A of 40 CFR 58 also includes requirements for collocation of samplers as part of quality checks for the PM_{2.5} and PM₁₀ monitoring networks. The CFR contains separate collocation requirements for PM_{2.5} and PM₁₀. The requirements are to be met for each primary quality assurance organizations (PQAO). Four PQAOs exist in California, one each for the San Francisco Bay Area AQMD, San Diego County APCD, and South Coast AQMD, and one for the remainder of the State, called the ARB PQAO, that has the ARB as a lead agency.

For PM_{2.5}, the CFR requires that for each PM_{2.5} monitoring method 15% of the sites within a PQAO have a collocated monitor of the same type. A preliminary evaluation leads ARB staff to believe that the ARB PQAO probably has sufficient collocated monitors to meet the requirement. However, at this time it is unclear exactly how many of each type of monitoring method there is in the ARB PQAO. ARB staff will continue to assess this matter.

California is a very large state in which environmental conditions, e.g., temperature, precipitation, humidity, wind speeds, and elevation, vary widely and the composition of the PM_{2.5} varies significantly. Also, a large number of operating agencies operate sites in the statewide PM_{2.5} network. ARB and local air districts designed the locations of collocated PM_{2.5} samplers to strike a balance in adequately representing all of these factors. In this way, the quality control function of the collocated monitoring is best realized. While Appendix A also requires 80% of the collocated monitors to be within $\pm 20\%$ of the applicable National Ambient Air Quality Standard (NAAQS), focusing on achieving this was deemed to result in too much clustering of the collocated monitors in too few of the factors needing representation.

The CFR also requires that 15% of PM₁₀ sites with manual monitoring have collocated samplers. However, the CFR language is much less specific as to what is required to meet the requirements. A U.S. EPA guidance document

provides needed clarification. There is a need for several additional collocated PM10 FRM samplers in the ARB PQAO. The Great Basin Unified APCD needs to deploy a collocated sampler at one of its sites. ARB staff informed the district about this. The district is drafting its own annual network plan. At this time, it appears that an additional five or six collocated samplers must be deployed in addition to the one in the Great Basin Unified APCD network. The ARB is considering the possible discontinuation of PM10 sampling at a couple of the ARB operated sites. This could affect the number of additional collocated sites needed.

For both PM2.5 and PM10, if the network needs to have additional collocation monitors in order to meet the requirements, we will work with the appropriate air monitoring agencies to deploy the required number of additional collocation monitors.

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Section 6. Operating schedules

The CFR requires that the annual network plan include information about operating schedules. While gaseous monitors (e.g., O₃, CO, NO₂, and SO₂) usually operate continuously and all year, particulate monitoring with federal reference methods (FRMs) often operates on one day out of every three days or one day out of every six days. The primary reason for particulate monitors operating less frequently is that the particulate FRMs are filter-based and therefore much more labor intensive, requiring that field staff frequently retrieve and replace filters and that laboratory staff pre- and post-weigh filters. Of course, the intended operating schedule can be disrupted by instrument failures and other unanticipated situations. The continuous gaseous monitors produce hourly measurements of the gaseous pollutants, while the particulate filter-based monitors produce 24-hour measurements of particulate pollutants.

Particulate matter operating schedules

Operating schedules for PM_{2.5} FRMs in the areas included in this volume are listed in Table 5 below. The current sampling frequencies at some of these sites is different than what is now required by the CFR. The proposed sampling frequencies are what ARB deems to be an appropriate sampling frequency for each site, taking into account the purposes served by each site monitoring PM_{2.5}. Filter-based sampling and laboratory analysis is laborious and expensive. Monitoring more frequently than needed is not an appropriate use of resources. ARB staff is in the process of seeking approval from the U.S. EPA on this.

While there are a number of continuous PM_{2.5} monitors deployed, these are not federal reference or equivalent methods. Over the course of the next couple years, air monitoring agencies in the area covered by this report may begin deploying recently available continuous PM_{2.5} monitors that are federal equivalent methods.

Operating schedules for the manual PM₁₀ samplers in the areas included in this volume operate on a one day (24-hour) in every six day schedule. There is one continuous PM₁₀ monitor operating in the area that this Volume 1 covers. This monitor is located at the South Lake Tahoe-Sandy Way site.

Table 5
Current PM2.5 Operating Schedules*
(Monitors for the small air districts included in this report)

Site Name	AQS Site #	Current	Laboratory
LAKE COUNTY AIR BASIN			
Lake County			
Lakeport-Lakeport Blvd	060333001	1 in 6 day	LAKE COUNTY
MOJAVE DESERT AIR BASIN			
Kern County			
Mojave-923 Poole Street	060290011	1 in 6 day	SAN DIEGO COUNTY
Ridgecrest-100 West California	060290015	1 in 6 day	SAN DIEGO COUNTY
MOUNTAIN COUNTIES AIR BASIN			
Calveras County			
San Andreas-Gold Strike Road	060090001	1 in 6 day	ARB
NORTH COAST AIR BASIN			
Mendocino County			
Ukiah-County Library	060450006	1 in 6 day	LAKE COUNTY
NORTHEAST PLATEAU AIR BASIN			
Siskiyou County			
Yreka-Foothill Drive	060932001	1 in 6 day	ARB
SACRAMENTO VALLEY AIR BASIN			
Butte County			
Chico-Manzanita Avenue	060070002	1 in 6 day	ARB
Colusa County			
Colusa-Sunrise Blvd	060111002	1 in 6 day	ARB
Placer County			
Roseville-N Sunrise Blvd	060610006	1 in 6 day	ARB
Shasta County			
Redding-Health Department Roof	060890004	1 in 6 day	ARB
Sutter County			
Yuba City-Almond Street	061010003	Everyday	ARB
Yolo County			
Woodland-Gibson Road	061131003	1 in 6 day	ARB

* All PM10 monitors in the area included in this report are operated on a 1 in 6 day schedule except the continuous PM10 monitor at the South Lake Tahoe (060170011) site.

Ozone operating schedules

While most O3 monitors operate continuously all year, a small number of O3 sites in the areas included in this volume operate only in the warmer six months of the year. Several of these sites are at higher elevation where access during the winter can be problematic. Also, for most of the State, O3 is a summertime problem and concentrations during the winter are well below the levels of the ambient air quality standards. The seasonal O3 sites in the areas included in this volume all operate from May through October. Here is the list of sites:

Cool (El Dorado County)
Jerseydale (Mariposa County)
Sutter Buttes (Sutter County)
South Lake Tahoe-Airport (El Dorado County)
Tuscan Butte (Tehama County)

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Section 7. Additional information on PM2.5 monitors

This section includes information for two required annual network plan elements that relate specifically to PM2.5 and do not fit well elsewhere in the report. One required element relates to whether data for a PM2.5 monitor can be used to determine compliance with the national annual PM2.5 air quality standard. In the CFR, this is termed as the suitability for comparison to the annual standard. The other element requires including in the annual network plan information regarding the review process followed by air agencies when changes are made to the location of a PM2.5 monitor that is violating a PM2.5 NAAQS.

7.1 Suitability for comparison to the annual PM2.5 NAAQS

The CFR requires that a PM2.5 FRM or FEM monitor be located at a neighborhood scale in order for the data from the monitor to be used in regulatory determinations of compliance with the annual PM2.5 NAAQS. For a PM2.5 monitor to be representative at a neighborhood scale, the concentration values measured by the monitor should be representative of concentrations expected over an area with dimensions of a few kilometers. So the monitor should not be located too close to a hot spot of PM2.5 concentrations that only extend over distances less than a few hundred meters, for example. All of the PM2.5 FRM monitors in California are sited to be representative of a neighborhood scale and meet this suitability requirement.

7.2 Review of changes to PM2.5 network

The PM2.5 network of FRM monitors in California was largely established in 1999 and completed in 2000. Little has changed in the siting of the network between then and now. While there is some interagency review of proposed changes to the State and Local Air Monitoring Stations (SLAMS) network, i.e., the network that includes PM2.5 as well as O3, CO, PM10, and other pollutants, no unique review process exists specifically for PM2.5.

ARB requests the opportunity to review and comment on the possible regulatory consequences of any proposal to move or discontinue a monitor for any pollutant that violates a national or State air quality standard. Furthermore, when a local agency proposes to move or discontinue a monitor indicating the highest concentrations of a pollutant in an area, ARB requests that the agency conduct a period of concurrent monitoring at that site and at the replacement site being proposed to represent the area as the required high site for the pollutant. This is expected even when the site is close to but not exceeding any standard for the pollutant. The concurrent monitoring is typically for a period of many months or a year, depending on the pollutant, the standard that is of most concern, and other factors.

The CFR requires that the U.S. EPA review and approve modifications to the SLAMS monitoring network, and requires that the responsible State or local agency inform the U.S. EPA of any proposed modifications. These requirements are in 40 CFR 58.14(b).

Section 8. Proposed monitoring site changes

This section lists proposals to add, remove, or move FRM or FEM monitors in the areas included in the scope of Volume 1 of this report before the end of 2009. In addition, we list some proposed changes to the monitoring that the ARB conducts in areas outside the stated geographical scope of Volume 1.

The Kern County APCD is proposing to add a new ozone monitoring site in the Tehachapi region of Kern County beginning mid-2008. Furthermore, as part of an EPA request, Kern County plans to initiate PM10 monitoring at the Domelands Improve site by the end of the third quarter 2008 to ascertain PM10 attainment status for the Kern River Valley portion of the SJV nonattainment area.

The Mendocino County AQMD is proposing to discontinue the Willits-899 South Main Street site because collected ozone, CO, and NO2 concentrations have been well below both State and federal ambient air quality standards in recent years. Furthermore, ozone concentrations are significantly higher at the Ukiah-East Gobbi Street site, which is in the same part of Mendocino County. In addition, the district is proposing to discontinue the CO and NO2 monitoring at the Ukiah-East Gobbi Street site due to the low concentrations measured at the site.

The ARB plans to add a new PM2.5 BAM monitoring site in the foothills area of Butte County. The ARB plans to relocate the Fresno-First Street monitoring site to a new location, approximately one block away from the current location. The actual date of the relocation has not been determined. ARB is looking for a replacement site for the Chico monitoring station, which currently is surrounded by tall trees on all sides of the station. Anticipating more years of monitoring at the Mount Wilson site, the ARB may propose to change the site from a Special Purpose Monitoring site to a SLAMS network site. ARB anticipates starting some additional N CORE monitoring at the Fresno-First Street site sometime later this year.

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Section 9. Access to more information about the network

While this report includes a great deal of information about the ambient air quality monitoring network, much more information is readily available, including summaries of the pollutant data from the monitors around the State. Much of this information is available on the web. This section lists a number of additional sources of such information. Also listed is contact information for the agencies responsible for the monitoring covered in Volume 1.

A broad overview of information about ambient air quality data in general that is in a question and answer format can be found at the following web page: <http://www.arb.ca.gov/aqd/aqfaq/>. This web page includes dozens of links to additional technical and non-technical information.

ARB's Monitoring and Laboratory Division (MLD) maintains web pages with information about all the existing monitoring sites that routinely monitor and submit air quality data in California. The pages also include detailed local maps showing the location of the sites. This information can be found at <http://www.arb.ca.gov/aaqm/mldaqsb/amn.htm>. A more general MLD web page that provides links to other aspects of ambient monitoring is located at <http://www.arb.ca.gov/aaqm/aaqm.htm>.

Volume 2 of this annual network report contains listings of monitoring in the State, along with the years for which data is available for each monitor and regional maps showing the locations of the monitoring sites. To review this report on the web, go to <http://www.arb.ca.gov/aqd/netrpt/netrpt.htm>. ARB's Planning and Technical Support Division (PTSD) maintains this information.

To view summaries of the official air quality data from sites around the State, go to <http://www.arb.ca.gov/adam/welcome.html>. For summaries of the data monitored today, yesterday, last week, and the last few months, go to <http://www.arb.ca.gov/aqd/aqinfo.htm>. These last two sources of information are maintained by the PTSD, as is the following more general web page that lists links to other aspects of the ambient air quality data program: <http://www.arb.ca.gov/aqd/aqdpag.htm>.

Agency contacts for ARB

Regarding this report and questions relating to the collected ambient air quality data:

Ron Rothacker, Manager, Air Quality Data Section, rrothack@arb.ca.gov, (916) 324-7672

or

Pheng Lee, Air Pollution Specialist, plee@arb.ca.gov, (916) 445-6059

Regarding the collection of the ambient data:

Ken Stroud, Chief, Air Quality Surveillance Branch, kstroud@arb.ca.gov,
(916) 324-7591

Regarding quality oversight of the monitoring program:

Merrin Bueto, Manager, Quality Assurance Section, mbueto@arb.ca.gov,
(916) 324-6191

Agency contacts for the air districts covered by Volume 1

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Jim Harris, Air Pollution Control Officer

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Butte County Air Quality Management District, Chico, CA

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Calaveras County Air Pollution Control District, San Andreas, CA

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Colusa County Air Pollution Control District, Colusa, CA

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El Dorado County Air Quality Management District, Placerville, CA

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Mendocino County Air Quality Management District, Ukiah, CA
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Tuolumne County Air Pollution Control District, Columbia, CA
Bill Sandman, Deputy Air Pollution Control Officer
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Yolo-Solano Air Quality Management District, Davis, CA
Mat Ehrhardt, Air Pollution Control Officer
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APPENDIX A

Regulatory language of 40 CFR 58.10

§ 58.10 Annual monitoring network plan and periodic network assessment.

(a)(1) Beginning July 1, 2007, the State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA.

(2) Any annual monitoring network plan that proposes SLAMS network modifications including new monitoring sites is subject to the approval of the EPA Regional Administrator, who shall provide opportunity for public comment and shall approve or disapprove the plan and schedule within 120 days. If the State or local agency has already provided a public comment opportunity on its plan and has made no changes subsequent to that comment opportunity, the Regional Administrator is not required to provide a separate opportunity for comment.

(3) The plan for establishing required NCore multipollutant stations shall be submitted to the Administrator not later than July 1, 2009. The plan shall provide for all required stations to be operational by January 1, 2011.

(b) The annual monitoring network plan must contain the following information for each existing and proposed site:

- (1) The AQS site identification number.
- (2) The location, including street address and geographical coordinates.
- (3) The sampling and analysis method(s) for each measured parameter.
- (4) The operating schedules for each monitor.

(5) Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.

(6) The monitoring objective and spatial scale of representativeness for each monitor as defined in appendix D to this part.

(7) The identification of any sites that are suitable and sites that are not suitable for comparison against the annual $PM_{2.5}$ NAAQS as described in §58.30.

(8) The MSA, CBSA, CSA or other area represented by the monitor.

(c) The annual monitoring network plan must document how States and local agencies provide for the review of changes to a $PM_{2.5}$ monitoring network that impact the location of a violating $PM_{2.5}$ monitor or the creation/change to a community monitoring zone, including a description of the proposed use of spatial averaging for purposes of making comparisons to the annual $PM_{2.5}$ NAAQS as set forth in appendix N to part 50 of this chapter. The affected State or local agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.

(d) The State, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies. For $PM_{2.5}$, the assessment also must identify needed changes to population-oriented sites. The State, or where applicable local, agency must submit a copy of this 5-year assessment, along with a revised annual network plan, to the Regional Administrator. The first assessment is due July 1, 2010.

(e) All proposed additions and discontinuations of SLAMS monitors in annual monitoring network plans and periodic network assessments are subject to approval according to §58.14.

APPENDIX B

Acronyms

APCD	Air Pollution Control District
AQMD	Air Quality Management District
AQS	Air Quality System
ARB	Air Resources Board
CFR	Code of Federal Regulations
CO	carbon monoxide
FEM	federal equivalent method
FRM	federal reference method
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standard
NO₂	nitrogen dioxide
O₃	ozone
PM₁₀	particulate matter (0 to 10 microns aerodynamic diameter)
PM_{2.5}	particulate matter (0 to 2.5 microns aerodynamic diameter)
PQAO	primary quality assurance organization
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SO₂	sulfur dioxide
U.S. EPA	United States Environmental Protection Agency