

**2006 Annual Report  
on the  
Air Resources Board's  
Fine Particulate Matter Monitoring Program**



March 2007



California Environmental Protection Agency

**Air Resources Board**

State of California  
California Environmental Protection Agency  
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Fine Particulate Matter Monitoring Program**

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### California's PM2.5 monitoring network now includes:

- Federally-approved monitors that measure PM2.5 mass over a 24-hour period at 81 sites;



Health and Safety Code 39619.5 requires the Air Resources Board (ARB) to provide an update by January 1 of each year on the status and results of the fine particulate matter (PM2.5) monitoring program. This report provides a summary of PM2.5 monitoring activities in 2006 and how the data are being used to support ARB programs.

California's PM2.5 air quality monitoring program provides information used for determining which areas violate standards, characterizing the sources that contribute to pollution, determining background concentrations, assessing pollution transport, and supporting health studies and other research. Monitoring data also provide information on how effective our programs are in improving air quality.

California's PM2.5 monitoring network began collecting data in 1998. A number of different types of PM2.5 monitors are operated to provide information on PM2.5 mass and chemical composition which are summarized below. Figure 1 displays the locations of PM2.5 monitors throughout the State. Additional information on the PM2.5 monitoring network can be found at:

<http://www.arb.ca.gov/aqd/pm25/pmfdsign.htm>

### Federal Reference Monitors

The installation of federally-approved PM2.5 mass monitors at 81 sites throughout California began in 1998 and was completed in 2000. These monitors collect particulate samples on filters, which are later weighed and analyzed in a laboratory. Because of this two-step process, PM2.5 air quality data collected with these monitors are not immediately available. To provide "real-time" PM2.5 air quality information, we added continuous PM2.5 mass monitors to our network.

### Continuous Mass Monitors

Continuous PM2.5 mass monitors provide valuable information for public reporting, temporal representation, health studies, transport studies, and background monitoring. PM2.5 mass can be measured continuously with several different commercially available technologies. We chose the Beta Attenuation Monitor (BAM) for use in

- Samplers that quantify PM2.5 mass continuously at 50 sites;



and

- Monitors that collect PM2.5 samples for analysis of chemical components at 17 sites.



California and have installed monitors at approximately 50 sites.

### **Speciation Monitors**

Another major stage of network implementation is the deployment of PM2.5 speciation monitors. Speciation monitoring provides valuable information about the composition (and ultimately sources) of PM2.5 pollution. However, monitoring of the individual species that make up PM is still an emerging field, with continuous speciation measurements the greatest challenge. To develop the best speciation network, California will need to take full advantage of emerging technologies. We are evaluating newly emerging methods not currently used in routine monitoring and working with manufacturers to improve these technologies.

### **Federally-Required Speciation Monitors**

There are two components to the PM2.5 speciation network in California. The first component, mandated by the U.S. EPA, required filter-based PM2.5 speciation monitoring at seven California sites that are now part of a national trends network for PM2.5 speciation. These monitors are the National Air Monitoring Stations (NAMS) monitors for the speciation network. Siting of the seven PM2.5 speciation monitors in Bakersfield, El Cajon, Fresno, Sacramento, San Jose, Riverside, and Simi Valley was completed in January 2002.

### **Additional Speciation Monitors**

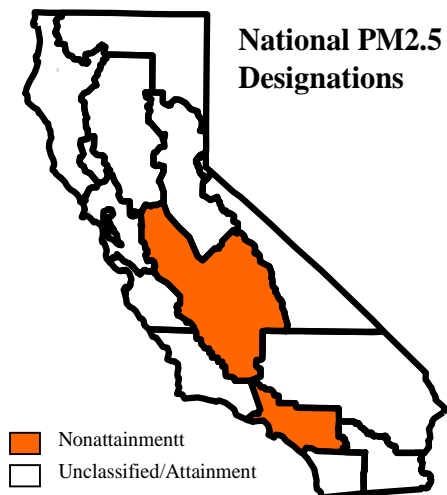
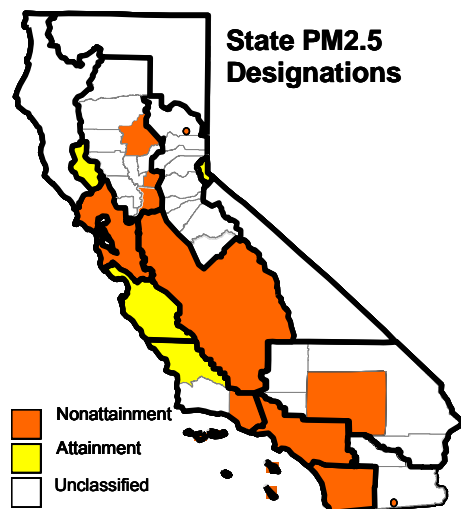
The second component of California's PM2.5 speciation network is the selection and deployment of samplers at selected State and Local Air Monitoring Stations (SLAMS). Data from these sites provide additional information needed for developing effective air quality attainment plans. The focus of the SLAMS PM2.5 speciation network is to enhance the spatial coverage of the NAMS sites in areas with a diversity of PM problems.

ARB and the air districts have deployed filter-based speciation monitors at ten sites - Anaheim, Calexico, Chico, Fontana, Escondido, Los Angeles, Modesto, Portola, Sacramento, and Visalia. To complete the SLAMS

## State and National PM2.5 Ambient Air Quality Standards

	California	National
Annual	12	15
24-hour	---	65 (35*)

The levels of the standards are expressed in micrograms per cubic meter.



\*For this recently tightened 24-hour national PM2.5 standard, areas will be designated in 2010.

speciation network, we are also evaluating various continuous sampling technologies.

### Accessing PM2.5 Data

Data collected as part of California's PM2.5 monitoring program can be obtained through a number of means. Daily PM2.5 values as well as summary statistics can be accessed through the interactive query program on ARB's web page at:

<http://www.arb.ca.gov/adam/welcome.html>

Real-time hourly PM2.5 data from California's continuous monitors can also be found at:

<http://www.arb.ca.gov/aqmis2/paqdselect.php>

In addition, the annual California Almanac of Emissions and Air Quality now includes a six-year summary of PM2.5 air quality data which is available at:

<http://www.arb.ca.gov/aqd/almanac/almanac.htm>

### PM2.5 Designations

Based on data collected as part of California's PM2.5 monitoring network, in 2006, the ARB designated areas as attaining or not attaining the State PM2.5 ambient air quality standard. All major urban areas of California exceed the State PM2.5 standard, as well as several more isolated sub-areas. Information on the 2006 designations can be found at:

<http://www.arb.ca.gov/regact/area06/area06.htm>

ARB will be updating the designations in late 2007.

The ARB also identified areas that do not meet the 1997 national PM2.5 standards (annual of 15 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and 24-hour of 65  $\mu\text{g}/\text{m}^3$ ) and proposed designations to the U.S. Environmental Protection Agency (U.S. EPA) in 2004. The U.S. EPA issued final designations which became effective in April 2005. Two areas in California do not meet the federal standards – the San Joaquin Valley Air Basin, and the South Coast Air Basin. These areas must submit State Implementation Plans in early 2008, with attainment of the

federal standards by 2015. Information on the federal designations can be found at:

<http://www.arb.ca.gov/desig/pm25desig/pm25desig.htm>

In September 2006, the U.S. EPA strengthened the national 24-hour PM2.5 standard from the 1997 level of 65 µg/m<sup>3</sup> to 35 µg/m<sup>3</sup>. The ARB will identify areas that do not meet this standard and submit proposed area designations to U.S. EPA in late 2007. U.S. EPA will formalize designations in 2010.

Figure 1: PM2.5 Monitoring Stations in California

