# SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

# 2009
# Ambient Air Monitoring Network Plan
# Submitted: June 29, 2010

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PREPARED BY

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# Introduction

The U.S. Environmental Protection Agency (EPA) finalized amendments to the ambient air monitoring regulations on October 17, 2006. These amendments revised the technical requirements for certain types of sites, added provisions for monitoring of $PM_{10}$ and $PM_{2.5}$, and reduced certain monitoring requirements for criteria pollutants. Monitoring agencies are required to submit annual monitoring network plans, conduct network assessments every five years, perform quality assurance activities, and, in certain instances, establish National Core (NCore) sites by January 1, 2011. (Note: Refer to Appendix E of this report for explanation of acronyms and definition of terms.)

The new regulations became effective December 18, 2006. Title 40, Part 58, Section 10(a) of the Code of Federal Regulations (40 CFR 58.10a) specifies that

> *"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 State and Local Air Monitoring Stations (SLAMS) including Federal Reference Method (FRM), Federal Equivalent Method (FEM) , and Approved Regional Methods (ARM) monitors that are part of SLAMS, NCore stations, Speciation Trends Network (STN) stations, State speciation stations, Special Purpose Monitor (SPM) stations, and/or, in serious, severe and extreme ozone nonattainment areas, Photochemical Assessment Monitoring Stations (PAMS), and SPM stations*."

This document is prepared and submitted as part of the fulfillment of these requirements.

**Section 1. Purposes, Scope, and Organization of Report**

In San Diego County there are 10 locations where the ambient air quality is routinely measured for gaseous and particulate air pollutants. These sites are operated by the San Diego Air Pollution Control District. The measured data provide the public with information on the status of the air quality and the progress being made to improve air quality. The data are used by health researchers, business interests, environmental groups, and others.

This report describes the network of ambient air quality monitors within the San Diego Air Basin (SDAB). The report meets requirements for an annual network plan as listed in 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 EPA by July 1, of each year.

As required by the regulations, this report includes monitors which are federal reference methods (FRM) or federal equivalent methods (FEM). While the CFR also requires reporting of approved regional methods (ARM), no ARMs are in operation in San Diego County at this time. The terms FRM, FEM, and ARM denote monitoring instruments that 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, this report also includes information regarding $PM_{2.5}$ continuous monitoring, $PM_{2.5}$ speciation monitoring and $PM_{2.5}$ sequential monitoring.

Table 1 lists the elements required by 40 CFR 58.10 to be in the network plan, and where these elements are located. This report will be available for a 30 day public inspection period, with comments to be submitted to the EPA. Hardcopies are available for review at District headquarters. For 2010, comments will be received and forwarded to EPA through August 15, 2010. Written comments should be submitted to David Shina, Senior Chemist, Ambient Monitoring Section, dshina@sdapcd.org, (858) 586-2768.

**Table 1**

Location of Information Required for Annual Network Plan

| Elements required by 40 CFR 58.10 | Location in Network Plan |
|---|---|
| | |
| Monitoring purpose information | Section 3, Table 3, and individual site descriptions |
| Evidence that siting and operation criteria are met | Section 4, Section 5, Tables 7, 8, 9a, 9b |
| Air Quality System Site Identification Number | Individual site descriptions |
| Location of sites<br>Street address<br>Geographic coordinates | Individual site descriptions |
| Sampling and analysis methods of monitors | Individual site descriptions |
| Operating schedules for monitors | Section 6, Tables 7, 8, 9a, 9b |
| Recent/proposed changes to network | Section 8 |
| Monitoring objectives and spatial scale | Individual site descriptions |
| Review of changes to PM2.5 Network | Section 8 |

# Overview of Network Operation

## Section 2. Network Design

The District operated 10 monitoring sites in 2009, which collected data on criteria pollutants. Four additional sites collected meteorological data only, which was used to assist with pollutant forecasting, data analysis and characterization of pollutant transport. The following two maps (Figure 1, Figure 2) show the locations of these sites. Table 2 lists the parameters measured at each site.

Since the San Diego County Air Pollution Control District was established by the County Board of Supervisors in 1955, occasional mobile air monitoring has been performed in remote portions of the County, including the mountain and desert areas. Historical measurements have shown relatively low levels of air pollution in these areas. Population and growth have remained low enough that routine air sampling has not been deemed necessary. As harmful air contaminants are most likely to be found in those areas where population is dense, traffic patterns are heavy, and industrial sources are concentrated, one would expect such contaminants to be most prevalent in the western portion of San Diego County. This is indeed the case. As pollutants are carried inland by prevailing winds, they are frequently trapped against the mountain slopes by a temperature inversion layer, generally occurring between 1500 and 2500 feet above sea level. Above the temperature inversion layer, pollutants are allowed to disperse freely. Our air monitoring stations are therefore found between the coast and the mountain foothills up to approximately 2000 feet. The monitoring network needs to be large enough to cover the diverse range of topography, meteorology, emissions, and air quality in San Diego, while adequately representing the large population centers. This monitoring network plays a critical role in assessing San Diego County's clean air progress and in determining pollutant exposures throughout the County.

Ambient concentration data are collected for a wide variety of pollutants. The most important of these in the SDAB are ozone ($O_3$), 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 ($PM_{10}$), and a number of toxic compounds. Other pollutants measured include oxides of nitrogen ($NO_x$), carbon monoxide (CO), and sulfur dioxide ($SO_2$). Monitoring for meteorological parameters is also conducted at most monitoring stations. Data for all of the pollutants is needed to better understand the nature of the ambient air quality in San Diego County, as well as to inform the public regarding the quality of the air.

Not all pollutants are monitored at all sites. Most sites monitor for multiple pollutants, while some sites monitor only one or two pollutants. A particular site's location and monitoring purpose determine the actual pollutants measured at that site.

A fundamental purpose of monitoring is to distinguish between areas where pollutant levels exceed the ambient air quality standards and areas where those standards are not exceeded. Health-based ambient air quality standards are set at levels that preclude adverse impacts to human health (allowing for a margin of safety). The District develops strategies and regulations to achieve the emission reductions necessary to meet all health-based standards. Data from the ambient monitoring network are then used to indicate the success of the regulations and control

strategies in terms of the rate of progress towards attaining the standards or to demonstrate that standards have been attained. Thus, there is an established feedback loop between the emission reduction programs and the ambient monitoring programs. Over the past thirty years, Federal, State and District regulatory/strategic measures have proven to be extremely successful at reducing levels of harmful air contaminants. Monitors once placed throughout the County to document the frequent and regular exceedance of ozone, nitrogen dioxide, carbon monoxide, and particulate matter now document the continued diminishing concentration trends of these pollutants.

Metropolitan Statistical Areas

Certain monitoring requirements in 40 CFR 58 are based upon Metropolitan Statistical Areas (MSAs). MSAs are part of a population, economic and social-based 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. The San Diego Air Basin contains a single MSA, the San Diego MSA. (Technically, since the 2000 census the San Diego MSA is properly termed the San Diego-Carlsbad-San Marcos, CA MSA.)

**Figure 1. San Diego County APCD Air Quality Monitoring Network, Criteria Pollutants – 2009**

**Figure 2. SDCAPCD Air Quality Monitoring Network, Meteorology-only Sites – 2009**

# Table 2
# List of San Diego County APCD Air Monitoring Sites

| Site Code | Site Name | Parameters Monitored[7] |
|---|---|---|
| ALP | Alpine | $O_3$, $NO_2$, TMP, WS/WD, HUM, $PM_{2.5}$[9,1], PAMS-VOC |
| CMP | Camp Pendleton | $O_3$, $NO_2$, TMP, WS/WD, $PM_{2.5}$[9,4], PAMS-VOC |
| CVA | Chula Vista | $O_3$, $NO_2$, $SO_2$, CO, TMP, WS/WD, $PM_{10}$, $PM_{2.5}$[10], CHO[6], Metals[6], TOX (ARB) $Cr^{+}6$[6] |
| DMR | Del Mar | $O_3$, WS/WD |
| DTN | San Diego – Beardsley Street[3] (Downtown) | $O_3$, $NO_2$, $SO_2$, CO, TMP, WS/WD, $PM_{10}$, $PM_{2.5}$[9], $PM_{2.5}$[10], TOX-VOC, Metals[2], $PM_{2.5}$-carbon[2] |
| DVN | Donovan | $PM_{10}$ |
| ECA | El Cajon | $O_3$, $NO_2$, TMP, WS/WD, HUM, $PM_{10}$, $PM_{2.5}$[9], $PM_{2.5}$[10], $PM_{2.5}$-carbon[5], CHO, TOX[6], Co-$PM_{2.5}$-carbon[2], Co-CHO[6], Metals[6], $Cr^{+}6$[6], Inorganics[5], Metals[5], PAMS-VOC |
| ESC | Escondido | $O_3$, $NO_2$, CO, TMP, WS/WD,$PM_{10}$, $PM_{2.5}$[8], $PM_{2.5}$[9], $PM_{2.5}$[10], $PM_{2.5}$-carbon[6], TOX-VOC, Wood Smoke[6], Co-$PM_{2.5}$-carbon[2], Inorganics[6], Metals[6] |
| KMA | San Diego – Overland Avenue (Kearny Mesa) | $O_3$, $NO_2$, TMP, WS/WD, HUM, BAR, SRD, $PM_{10}$, Co-$PM_{10}$, $PM_{2.5}$[10], Co- $PM_{2.5}$[10], CHO, PAMS-VOC, Co-PAMS-VOC |
| MMR | Miramar | RWP/RASS |
| MTS[7] | Mount Soledad | WS/WD |
| OTM | Otay Mesa | $O_3$, $NO_2$, $SO_2$, CO, TMP, WS/WD, $PM_{10}$, Co-$PM_{10}$, TOX-VOC, Metals[2] |
| PTL | Point Loma | RWP/RASS |
| SMP | San Marcos Peak | WS/WD |

[1] This sampler has been in operation since 2005, in support of the Children's Health Study
[2] Samples analyzed at San Diego APCD laboratory
[3] The Downtown-San Diego site was moved from its 12th Avenue location in July, 2005 to allow for the development of Petco Park
[4] A FEM BAMS replaced the non-FEM BAMS on 7/22/09 at CMP
[5] Samples analyzed at EPA's Research Triangle Institute laboratory
[6] Samples analyzed at ARB's Sacramento laboratory
[7] For the definition of all abbreviations, see Appendix E
[8] Continuous $PM_{2.5}$, Federal Equivalent Method (FEM)
[9] Continuous $PM_{2.5}$, Non-FEM
[10] Sequential $PM_{2.5}$, 24-hour, Federal Reference Method

## Section 3. Purposes Served by the Monitors

The data from a network of air quality monitors serves many purposes. The data are useful to health researchers, the general public, regulatory agency staff, environmentalists, business interests, and others. Air quality samples are generally collected for one or more of the following purposes:

- To judge compliance with and/or progress made towards meeting ambient air quality standards.
- To activate emergency control procedures that prevents or alleviates air pollution episodes.
- To observe pollution trends throughout the region, including non-urban areas.
- As the basis of daily reports to the public in newspapers, on the District's website and air quality forecast recordings, and on radio and television.
- To provide a database for research; urban, land-use, and transportation planning and development and evaluation of abatement strategies.
- To determine 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. Some of the purposes are met by a limited number of monitors, such as monitoring for the highest pollutant concentration. Most are used for public reporting of the ambient air quality and for trends monitoring. Some purposes may be served infrequently, such as for analyzing an episode of particularly bad air quality, or for short to long term scientific studies.

A list of purposes along with short descriptions is included below, followed by Table 3, which lists the purpose(s) of each monitor included in this report. The purpose codes are defined at the end of Table 3. Although the "general" purpose may apply to most monitors, the code for "general" only appears if that purpose is the most important for the monitor.

Note: The individual site descriptions of this report list the "monitoring objectives" of the monitors. This is different than how the term "general" is used in this section. The CFR requires that the monitoring objectives be listed in the annual network report; these monitoring objectives are the federal monitoring objectives as defined by the EPA. They do not include several additional local monitoring objectives. This section of the report lists the broader purposes served by the monitors.

List of Purposes with Descriptions

*Agricultural Burning* refers to the intentional use of fire for the burning of vegetation produced wholly from the growing and harvesting of crops in agricultural operations; including the burning of grass and weeds in fence rows, ditch banks, and berms in non-tillage orchard operations, fields being prepared for cultivation, agricultural wastes, and the operation or maintenance of a system for the delivery of water for agricultural operations.

*Background Level* monitoring is used to determine general background levels of air pollutants.

*High Concentration* monitoring is done at sites to determine the highest concentration of an air pollutant in an area within the monitoring network. This type of monitoring is necessary in order to show that an area attains the air quality health standards.

*Pollutant Transport* is the movement of a pollutant between air basins. Transport monitoring is used to help determine whether observed pollutant concentrations are locally generated or generated outside of the air basin and blown ("transported") in, thereby raising local ambient air pollutant concentrations.

*Public Reporting* means providing air quality information to the general public in a timely manner via newspapers, air quality recordings, District web pages, public media outlets such as television and radio, air quality maps, and data reports.

*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. They may not indicate the highest concentrations in the area.

*Residential Burning* is the open burning of yard waste by household residents. Data from monitors with this purpose guide decisions regarding appropriate times to allow burning.

*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 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 and cost-effective measures. The SIP is a plan prepared by States and submitted to the EPA describing how each area will attain and maintain national ambient air quality standards. Once an area attains a National Ambient Air Quality Standard (NAAQS), the area is required to maintain that status, which requires continued monitoring in the area and an air quality maintenance plan.

*Trend Analysis* monitoring is useful for comparing and analyzing air pollution concentrations over. Trend analyses show the progress or lack of progress in improving air quality for an area over a period of years.

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

**TABLE 3**
MONITORING PURPOSES
(Monitoring active in 2009 in the San Diego County Air Basin)

| Name | AIRS ID | $O_3$ | CO | $NO_2$ | $SO_2$ | $PM_{2.5}$ | $PM_{10}$ |
|---|---|---|---|---|---|---|---|
| Alpine<br>2300 W. Victoria Dr. | 60731006 | P,S/UV/US/HC, BURN,TRENDS | | P,S/CL/US/RC | | SP/CT/NS/RC, BURN | |
| Camp Pendleton<br>21441 W. B St. | 60731008 | P,S/UV/NS/BL, TRENDS | | P,S/CL/NS/BL | | P/CT/NS/BL | |
| Chula Vista<br>80 E. J St. | 60730001 | S/UV/NS/RC | S/IR/NS/RC | S/CL/NS/RC | S/FL/NS/RC, TRENDS | S/SQ/NS/RC | S/SI/NS/RC |
| Del Mar<br>225 9th St. | 60731001 | S/UV/NS/BL, TRENDS | | | | | |
| El Cajon<br>1155 Redwood Ave. | 60730003 | P,S/UV/NS/RC, BURN | | P,S/CL/US/IM | | S/SQ,CT,SP/ NS/RC | S/SI/NS/RC |
| Escondido<br>600 E. Valley Parkway | 60731002 | S/UV/NS/RC, BURN | S/IR/NS/RC | S/CL/NS/RC | | S/SQ,CT,SP/ NS/RC | S/SI/NS/RC |
| Otay Mesa-Border Crossing<br>1100B Paseo International | 60732007 | S/UV/NS/RC, TRENDS | S/IR/NS/RC, TRENDS | S/CL/NS/RC, TRENDS | S/FL/NS/RC, TRENDS | | S/SI/NS/HC |
| Otay Mesa-Donovan<br>Donovan State Prision Rd | 60731014 | | | | | | S/SI/NS/HC |
| San Diego-Beardsley<br>1110A Beardsley St. | 60731010 | S/UV/NS/RC, SIPM | S/IR/NS/RC, SIPM | S/CL/NS/RC | S/FL/NS/RC | S/SQ,CT/NS/ RC | S/SI/NS/HC |
| San Diego-Overland<br>5555 Overland Ave. | 60730006 | P,S/UV/NS/RC, SIPM | | P,S/CL/NS/RC | | S/SQ/NS/RC | S/SI/NS/RC |

GLOSSARY OF TERMS

Monitor Designation

| | |
|---|---|
| P | Photochemical Assessment Monitoring (PAMS) |
| S | State and Local Air Monitroing Stataions (SLAMS) |
| SP | Special Purpose Monitoring (SPM) |

Sampling or Analysis Method

| | |
|---|---|
| CL | Chemiluminescence |
| CT | high volume, Continuous sampler, size selective inlet[1] |
| FL | Fluorescence |
| IR | nondispersive Infared |
| SI | high volume sampler, Size selective inlet |
| SP | low volume, Speciated sampler |
| SQ | low volume Sequential sampler, size selective inlet |
| UV | UltraViolet absorption |

Spatial Scale

| | |
|---|---|
| NS | Neighborhood Scale |
| US | Urban Scale |

Monitoring Objective (federal)

| | |
|---|---|
| RC | Representative Concentrations |
| BL | Background Levels |
| HC | High Concentrations |
| IM | Source Impact |

Monitoring Objective (local)

| | |
|---|---|
| BURN | support residential/agricultural/prescribed BURN decisions |
| TRENDS | TRENDS analysis |
| SIPM | State Implementation Plan (SIP) Maintenance requirement |

[1] A continuous Particulate Monitor (PM), provides real-time hourly concentration values. This is useful for public recording, better understanding of episodes of high PM concentrations, identification or source pollutants, possible allowance for less frequent filter sampling (sequential), etc.

Lead Monitors are not included in the table, because the lead concentrations in the greater San Diego Air Basin are far below the health-based standards in these areas.

**Section 4. a. Minimum Monitoring Location Requirements**

EPA regulations specify the minimum number of sites at which State and local air agencies must deploy monitors. The State and local agencies generally find they need to deploy more monitors than are minimally required to fulfill State and local purposes for monitoring. For example, California air quality standards are more stringent than federal standards, so many areas need more monitors than required to show compliance with national standards. The public also expects to be informed of the actual air quality conditions near where they live and work.

For pollutants that most frequently exceed ambient standards, the number of monitors required in California by the 2006 regulations is a dramatic increase over the number required by the previous regulations. Requirements for the number of monitors are in the 40 CFR 58, Appendix D. For ozone, $PM_{2.5}$, and $PM_{10}$, the required minimum number is based on the population of an area and the severity of the air quality in that area. For other pollutants, no monitoring is required unless an area exceeds or is close to exceeding a NAAQS. For purposes of the minimum requirements, the areas are defined by the MSAs developed by the U.S. Census Bureau (see Metropolitan Statistical Areas in Section 2).

Tables 4, 5, and 6 list information on the number of ozone, $PM_{2.5}$, and $PM_{10}$ monitors in San Diego County, and the number required by Appendix D. In all cases, sufficient monitoring exists in San Diego County. The number of monitors required is based on the MSA population (taken from the 2000 U.S. Census extrapolated to 2009 by San Diego Association of Governments (SANDAG)), combined with the degree to which air quality in the MSA is greater than or less than the NAAQS.

## Ozone

(Note: Refer to section 4.1 and Table D-2 in Appendix D of 40 CFR 58)

**Table 4. Minimum Monitoring Requirements for Ozone**

| MSA | County | Pop. (2009) | 8-hour Design Value (2007-2009) | Min. # Sites Required | # Active Sites | Monitors Needed |
|---|---|---|---|---|---|---|
| 1 – San Diego | 1 – San Diego | 3.2 million | 0.089 | 2 | 9 | None |

## CO, $NO_2$, $SO_2$, Pb

(Note: Refer to sections 4.3, 4.4, 4.2 and 4.5 respectively in Appendix D of 40 CFR 58)

Monitoring for carbon monoxide (CO), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), and lead (Pb) is not currently required anywhere in California in order to comply with requirements of Appendix D. Ambient concentrations for these pollutants do not exceed the NAAQS and do not trigger requirements for monitoring. (For latest information on lead, refer to Appendix D, The New Lead Standard: 2009) As required by a another section of 40 CFR 58 that takes effect in 2011, a few sites in major urban areas of California will need to include monitoring of these pollutants (NCore). One of the six planned California NCore sites will be the District's expanded El Cajon monitoring station. (Refer to Appendix C, NCore Network Plan.)

## $PM_{2.5}$

(Note: Refer to section 4.7 and Table D-5 in Appendix D of 40 CFR 58)

**Table 5. Minimum Monitoring Requirements for $PM_{2.5}$**

| MSA | County | Pop. (2009) | Ann. Design Value (2007-2009) | Daily Design Value (2007-2009) | Min. # Sites[1] Required | # Active Sites[2] | Monitors Needed |
|---|---|---|---|---|---|---|---|
| 1 – San Diego | 1 – San Diego | 3.2 million | 13.7 $\mu g/m^3$ | 32 $\mu g/m^3$ | 9[2] | 12[2] | none |

[1] 40 CFR 58 requires three FRM sampling locations with one location to be collocated.
40 CFR 58 requires two continuous samplers with one additional sampler to be collocated.
The District is required to operate two Speciation Trends Network (STN) samplers.
This gives a total of 9 required $PM_{2.5}$ samplers that must be run in the network.

[2] The District operated five FRM samplers at five locations with an additional one collocated.
The District operated one FEM continuous samplers (In 7/22/09, we changed the Camp Pendleton non-Fem sampler to a FEM sampler). This gave a total of two FEM samplers.
The District operated five non-FEM continuous samplers at five locations (In 7/22/09, we changed the Camp Pendleton non-Fem sampler to a FEM sampler). This gave a total of four non-FEM samplers.
The District currently operates two STN samplers at two locations.
This gives a grand total of 11 $PM_{2.5}$ samplers at 7 sampling locations.

### Suitability for Comparison to the Annual $PM_{2.5}$ NAAQS

The CFR requires that for $PM_{2.5}$ FRM or FEM data to be used in regulatory determinations of compliance with the annual $PM_{2.5}$ NAAQS, the monitor must be located at a neighborhood scale. For a $PM_{2.5}$ 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. The monitor, therefore, should not be located too closely to a hot spot of $PM_{2.5}$ concentrations that only extends over distances of less than a few hundred meters. All of the $PM_{2.5}$ FRM monitors in San Diego are sited to be representative of a neighborhood scale and meet this suitability requirement.

### Review of Changes to $PM_{2.5}$ Network

The $PM_{2.5}$ 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 $O_3$, CO, $PM_{10}$, and other pollutants, thus far, no review process specifically for $PM_{2.5}$ has been established. Existing $PM_{2.5}$ network enhancement is addressed in Section 9 under Proposed Instrument Additions to the Network / $PM_{2.5}$.

## $PM_{10}$

(Note: Refer to section 4.6 and Table D-4 in Appendix D of 40 CFR 58)

**Table 6. Minimum Monitoring Requirements for $PM_{10}$**

| MSA | County | Pop. (2009) | Average Highest Value[1] (2007 - 2009) | Min. # Sites[2] Required | # Active Sites | Monitors Needed |
|---|---|---|---|---|---|---|
| 1 – San Diego | 1 – San Diego | 3.2 million | 90.3 $\mu g/m^3$ | 2 – 4 | 7 | none |

[1] Based upon data from all $PM_{10}$ sites except Otay Mesa. Measurements at the Otay site are heavily influenced by its proximity to the Otay port-of-entry for trucks, and are not representative of ambient $PM_{10}$ concentrations within the region. This was not a problem when the site was established in 1990. (See discussion on the Donovan and Otay Mesa sites.)

[2] The District operated seven $PM_{10}$ samplers at seven locations; Two locations have collocated $PM_{10}$ samplers.

## PAMS

(Note: Refer to section 5 and Table D-6 in Appendix D of 40 CFR 58)

PAMS design criteria are site specific. Concurrent measurements of $O_3$, $NO_2$, CO, meteorology, and $VOC_{-speciated}$ is required at each location, unless otherwise specified. Monitoring CO is not currently required anywhere in California in order to comply with requirements of Appendix D. Ambient concentrations for CO does not exceed the NAAQS and do not trigger requirements for monitoring. The District operates four PAMS sites and they are: Camp Pendleton (Type I), San Diego-Overland (Type II, secondary), El Cajon (Type II, primary), and Alpine (Type III). San Diego has an exemption for a Type IV site.

### Section 4. b. Additional Sampling

## TOXICS

As yet, there are no design criteria in the 40 CFR 58 for Toxics Sampling.
The District operates three Toxics-Elemental carbon samplers (MetOne SASS) at three locations:
San Diego-Beardsley; Escondido; El Cajon
The District operates two Toxics-Metals samplers (Xontech 924) at two locations:
San Diego-Beardsley; Otay Mesa
The District operates three Toxics-VOC samplers (Xontech 910) at three locations:
Otay Mesa; San Diego-Beardsley; Escondido

The District operates samplers for other Regulatory Agencies and they perform all analyses.
For Toxics-Elemental carbon, two samplers (URG-3000N) at two locations are used:
Escondido (CARB); El Cajon (EPA)
For Toxics-Metals, two types of samplers at three locations are used:
Chula Vista (CARB with a Xontech 924); El Cajon (CARB with a Xontech 924);
Escondido (CARB with a MetOne SASS); El Cajon (EPA with a MetOne SASS)
For Toxics-VOCs, two samplers (Xontech 910) at two locations are used:
Chula Vista (CARB); El Cajon (CARB)

## Section 5. Required Quality Assurance of the Monitoring Program

Content of this section, along with information on the web link below, demonstrates compliance with requirements of 40 CFR 58 Appendices A, C, and E. This information is required in annual network plans.

Annually, or more frequently, the District's Ambient Network's Quality Assurance Section conducts Quality Assurance (QA) performance evaluations (audits) for each sulfur dioxide, nitrogen dioxide, ozone, and carbon monoxide analyzer in the network with National Institute of Standards and Technology (NIST)-traceable gases and calibrators. Each field analyzer is audited at three or more levels using known concentrations of gases. These same monitors are calibrated on a similar schedule (not less than 6 months from the audit*), with comparable but separate standard equipment by a separate group of District staff who function independently from the audit staff. Flow standards are also NIST-traceable and recertified annually.

> *If an analyzer must be recalibrated at a time other than its scheduled calibration date, due to maintenance issues, etc., the audit schedule is not adjusted to occur 6 months from this recalibration date. Similarly, the annual calibration is not adjusted to occur 12 months from the recalibration date. All audits and calibrations are performed on a strictly adhered to schedule.

$PM_{10}$ monitor flow rate audits are done bi-annually, while the $PM_{10}$ monitor flow rate calibrations are done annually. Both are conducted with dedicated kits that include a primary orifice that is certified annually by the ARB, a digital manometer and multimeter that are certified annually, and a digital thermometer that is certified every two years. $PM_{10}$ flow rates are checked monthly against a separate standard by field technicians.

$PM_{2.5}$ samplers are all calibrated and audited quarterly (twice the EPA minimum; cf. only semi-annual flow rate audits for all PM monitors are required by the 40 CFR 58) with dedicated kits for each program that include BGI TriCal digital flow calibrators, thermocouples, and hygrometers, which are certified against NIST-traceable primary standards. In addition to the District's in-house quality assurance program, annual monitoring station audits are performed by ARB's Quality Assurance Section (QAS). The field technicians also perform monthly flow, pressure and temperature checks on $PM_{2.5}$ samplers using certified/referenced instruments. $PM_{2.5}$ samplers and some network gaseous analyzers are further quality assured with audits conducted by an EPA Region IX contractor.

As part of the annual ARB QAS 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 58, Appendix E requirements.

Information about each air monitoring station audited by QAS is available at http://www.arb.ca.gov/qaweb/ site.php. The ARB 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. (Note: Site descriptions included in this District report are more current and take precedent over information to be found on the QAS website.) There are site photographs taken since the year 2000 included in the QAS pages for most sites.

Ozone audits and calibrations are performed using dedicated ozone transfer standards (API 400) for each program, that are certified quarterly with a laboratory API 401 $O_3$ standard that is itself certified annually by the CARB with referencing to a NIST-referenced Standard $O_3$ Photometer.

$NO_2$, $SO_2$, and CO calibrations and audits are performed by using dedicated multi-gas calibrators (API 700), for each program, that are certified bi-annually with Laminar Flow Elements that themselves are certified annually.

The Toxics-VOC program participates in an annual Performance Evaluation, using certified NIST-referenced gases and an annual intra-State laboratory comparison overseen by the CARB. Also, the program participates in the bi-annual NATTS Performance Evaluation.

The Toxics-Metals program participates in an annual Performance Evaluation overseen by the EPA.

The Toxics-Carbon program does not yet have an annual Performance Evaluation by the EPA nor the CARB.

The PAMS-VOC program participated in an EPA Region IX audit. The District plans to participate in Region IX's annual performance evaluation.

The PAMS-Carbonyls program participates in bi-annual Performance Evaluations overseen by the EPA.

All of the programs (PAMS-VOC's, PAMS-Carbonyls, Toxics-Metals, Toxics-Elemental Carbon, and Toxics-VOC's) are all calibrated with NIST-referenced or NIST-traceable standards.

All audits performed by the District are conducted in accordance with 40 CFR 58, Appendix A. Meteorological audits are conducted with instruments that are NIST-traceable and/or manufacturer-certified.

The District also ensures the quality of the data collected at its monitoring sites through analysis of precision and accuracy data submitted to the EPA's ambient air quality database, the Air Quality System (AQS). On a quarterly basis, District staff review the frequency of flow rate verifications for manual PM samplers and automated PM analyzers, review collocated sampling data, and quality assure biweekly single-point quality control checks for gaseous instruments which are performed on all criteria pollutant analyzers throughout the Network. Staff routinely scrutinizes precision data for validity and usability. The data analyses are conducted in accordance with 40 CFR 58, Appendix A. Each year, the District "certifies" the data that have been submitted to AQS. This certification confirms that the data have complied with all 40 CFR 58 guidelines and regulations pertaining to data quality assurance and data completeness. On June 30, 2009, the District certified the 2008 AQS data. On May 13, 2010, the District certified the 2009 AQS data.

Approximately every five years, the EPA conducts a Technical Systems Audit (TSA) of the District's air quality monitoring network and procedures (the last TSA was in June of 2006). The audits examine all aspects of the District's Analytical laboratory and field monitoring/data processing operations.

One purpose for the Technical Systems Audit is to determine if a district's air monitoring program satisfies the requirements of 40 CFR 58 and 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 (e.g. attainment/nonattainment designations).

Appendix A of 40 CFR 58 also includes requirements for collocation of samplers as part of quality checks for the $PM_{2.5}$ and $PM_{10}$ monitoring networks. Requirements are listed separately for $PM_{2.5}$ and $PM_{10}$.

For $PM_{2.5}$, at least 15% of the FRM sites in the District have a collocated FRM, meeting a requirement of Appendix A. Additionally, three of the FRM sites have collocated $PM_{2.5}$ samplers other than FRM. California is a very large state in which environmental conditions such as temperature, precipitation, humidity, wind speeds and elevation vary widely and the composition of the $PM_{2.5}$ varies significantly. A large number of agencies operate sites in the statewide $PM_{2.5}$ network. The ARB and local air districts assigned the locations of collocated $PM_{2.5}$ samplers to strike a balance which adequately represented 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 NAAQS, focusing on achieving this would have resulted in a clustering of the collocated monitors into too few of the desired representation categories. EPA Region IX has approved the current California $PM_{2.5}$ collocation network.

40 CFR 58 also requires that 15% of $PM_{10}$ sites with manual monitoring have collocated samplers. Two of the District's six $PM_{10}$ sites have collocated FRM samplers, meeting the Appendix A requirement

## Section 6. Operating Schedules

40 CFR 58 requires information about operating schedules be included in the annual network plan. Gaseous monitors ($O_3$, CO, $NO_2$, and $SO_2$) operate continuously throughout the year. PM monitoring with FRMs, generally, operates on one day out of every three (1:3) or one day out of every six (1:6) and for special circumstances, on a daily cycle (1:1). The PAMS-VOC & Carbonyls and the TOXICS programs operate on a 1:6 schedule. The intended operating schedule may occasionally be disrupted by instrument failures and other unanticipated situations. The continuous gaseous monitors produce real-time measurements of the gaseous pollutants averaged hourly. The non-continuous particulate filter-based monitors produce 24-hour integrated measurements.

The PAMS-VOC & Carbonyls and TOXICS monitors produce 24-hour integrated measurements, except during PAMS season (July 1- October 31) when four-three hour samples are collected (each sample undergoes a 3-hour integrated measurement). This disparity in the sampling frequency for FRM-PM monitoring, Toxics-VOCs and PAMS-VOCs and PAMS-Carbonyl monitoring, a one day out of every six (1:6) as opposed to a 1:1 frequency, is because they are manual methods that have physical limitations to manpower hours, equipment usage, and equipment expense that all proffer elevated expenses.

The recommended Schedule of operation for TOXICS-VOCs is in Table 8. The TOXICS-VOCs samplers a one day out of every six (1:6) sampling schedule for a 24 hour duration, except during PAMS season (see paragraph1). The recommended Schedule of operation for TOXICS-Metals is 1:12.

The Schedule of operation for PAMS is in Table 9a and Table 9b. The schedule of operation for PAMS samplers follow the 40 CFR 58, Subpart B, section 58.13, where there is a one day in six sampling frequency for a 24 hour duration, except for PAMS season (see paragraph 1). This monitoring schedule is adhered to nationwide.

Operating schedules for the Network's $PM_{2.5}$ FRMs are listed in Table 7. The EPA recently revised the sampling frequencies required for $PM_{2.5}$ FRMs. The existing sampling frequencies are those which the District has found to be appropriate for each site, taking into account the purposes served by each site monitoring $PM_{2.5}$. Filter-based sampling and laboratory analysis is time consuming, and requires a significant amount of laboratory investment; therefore, expensive.

Operating days for the $PM_{10}$ samplers are according to an EPA monitoring schedule adhered to by all $PM_{10}$ samplers nationwide. Sampling is conducted over a 24-hour period every sixth day. This 1:6 sampling schedule ensures that sampling occurs on all days of the week to see if there are significant differences on specific days of the week (or weekday/weekend differences).

**Table 7. Operating Schedule for District's Particulate Samplers in 2009**

| Site | Co-$PM_{10}$[1] | Co-$PM_{10}$[1] | $PM_{2.5}$[2] | Co-$PM_{2.5}$[2] | BAM | Co-BAM | SASS[4] | $PM_{2.5\text{-carbon}}$ STN[5,7] | $PM_{2.5\text{-carbon}}$ APCD |
|---|---|---|---|---|---|---|---|---|---|
| ALP | | | | | continuous[3] | | | | |
| CMP | | | | | continuous[3,9] | | | | |
| CVA | 1:6 | | 1:3 | | | | | | |
| DTN | 1:6 | | daily | | continuous[3] | | | | 1:6 |
| DVN | 1:6 | | | | | | | | |
| ECA | 1:6 | | 1:3 | | continuous[3] | | 1:3 | 1:3 | 1:6 |
| ESC | 1:6 | | 1:3[8] | | continuous[6] | continuous[3] | 1:6 | 1:6[10] | 1:6 |
| KMA | 1:6 | 1:6 | 1:3 | 1:12[8] | | | | | |
| OTM | 1:6 | 1:6 | | | | | | | |

[1] GMWL 2000H with Sierra-Andersen 1200 head
[2] Thermo (R&P) FRM Partisol-Plus 2025
[3] MetOne BAM 1020
[4] MetOne SASS
[5] URG 3000N
[6] MetOne FEM BAM 1020
[7] $PM_{2.5\text{-carbon}}$ samples collected from SASS units run on $PM_{10}$ schedule
[8] Effective 1/1/08
[9] The non-FEM BAMS was replaced with an FEM-BAMS on 7/22/09
[10] MetOne SuperSASS

**Table 8. Operating Schedule for District's Toxics Samplers**

| **XonTech 924** | | | | | | | **XonTech 910 (gases)**[3] | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Channel | | | | | |
| Site | Agency | Schedule | Duration | Carbonyls[1] | Metals[2] | Chromium VI[2] | Site | Agency | Schedule |
| CVA | ARB | 1:12 | 24 hrs | x | x | x | CVA | ARB | 1:12 |
| DTN | APCD | 1:12 | 24 hrs | | x | | DTN | APCD | 1:6 |
| ECA | ARB | 1:12 | 24 hrs | x | x | x | ECA | ARB | 1:12 |
| | | | | | | | ESC | APCD | 1:6 |
| OTM | APCD | 1:12 | 24 hrs | | x | | OTM | APCD | 1:6 |

[1] Gas sample adsorbed onto DNPH-coated silica gel
[2] Particulate sample collected on filter
[3] Gas sample collected in canister

## Table 9a. Operating Schedule for District's PAMS Samplers (Carbonyls)

| [1]XonTech 925 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start time at midnight with a 24 hr duration | | | | | | | | Start time at T# with a three hour duration during PAMS season only | | | | | |
| | | Schedule | | | | Flow | | | | | | Duration | Flow |
| Site | Agency | PAMS | NON-PAMS | Ch A | Ch B | cc/min | Field Blank | T1 | T2 | T3 | T4 | | cc/min |
| ECA | APCD | 1:6 | 1:6 | 24 hrs | 24 hrs | 150 | Yes | 0200 | 0500 | 1200 | 1600 | 3 hrs | 1300 |
| KMA | APCD | 1:6 | 1:6 | 24 hrs | 24 hrs | 150 | Yes | 0200 | 0500 | 1200 | 1600 | 3 hrs | 1300 |

[1] Gas sample adsorbed onto DNPH-coated silica gel

## Table 9b. Operating Schedule for District's PAMS Samplers (VOCs)

| | [1]XonTech 910, 910/912 PAMS STATIONS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PAMS SEASON | | | | | | | NON-PAMS SEASON | | |
| | Agency | Schedule | Duration | Start time with three hr duration (912) | | | | Flow | Schedule | Duration | Flow |
| | | | | Ch 1 | Ch 2 | Ch 3 | Ch 4 | cc/min | | | cc/min |
| ALP | APCD | 1:6 | 3 hrs ea | 0200 | 0500 | 1200 | 1600 | 50 | 1:6 | 24 hrs | 7 |
| CMP | APCD | 1:6 | 3 hrs ea | 0200 | 0500 | 1200 | 1600 | 50 | 1:6 | 24 hrs | 7 |
| ECA | APCD | 1:6 | 3 hrs ea | 0200 | 0500 | 1200 | 1600 | 50 | 1:6 | 24 hrs | 7 |
| KMA | APCD | 1:6 | 3 hrs ea | 0200 | 0500 | 1200 | 1600 | 50 | 1:6 | 24 hrs | 7 |
| Co-KMA | APCD | 1:6 | 3 hrs @ 1200 | N/A | N/A | N/A | N/A | 50 | 1:6 | 24 hrs | 7 |

[1] Gas sample collected in canister

## Section 7. Recent or Proposed Modifications to the Network

Were the District to propose to move or discontinue a monitor for any pollutant that violates a national or State air quality standard, both the EPA Region IX and the ARB would have the opportunity to review and comment on the possible regulatory consequences of such action. Furthermore, the District would, generally, conduct a period of parallel sampling at the current site and the proposed site for a term of several months to one year, depending upon the pollutant, the standard that is of most concern, and other factors.

40 CFR 58 requires that the EPA review and approve modifications to the SLAMS monitoring network, and requires the responsible State or local agency to inform the EPA of any proposed modifications. These requirements are in 40 CFR 58.14(b).

Recent Additions

Carbon

Two URG-3000N carbon samplers are in the network. One is at the El Cajon site and the other is at the Escondido monitoring station. The $PM_{2.5}$ filter samples are analyzed at Research Triangle Institute (RTI-North Carolina) and at the ARB-Sacramento laboratories respectively, for the organic carbon/elemental carbon (OC/EC) component (used as a surrogate for ambient diesel particulate concentrations). The District has collocated MetOne SASS samplers and we have been analyzing for carbon, since March, 2008. With the addition of a MetOne SASS sampler at our Downtown location, the District is now collecting and analyzing carbon samples from three sites. The San Diego APCD laboratory also received an LC-ICP-MS analyzer in late 2007, and it will be utilized to determine the toxic and non-toxic elemental/metallic contributions to $PM_{2.5}$ particulates at the Otay Mesa and San Diego-Beardsley sites. Method development has taken longer than expected, but it is on track to be completed by the end of 2010.

$PM_{2.5}$ -continuous

A new FEM BAM 1020 continuous $PM_{2.5}$ sampler has been added to the network. It was installed at the Camp Pendleton monitoring location, and began collecting data on July 22, 2009. This sampler has been used for forecasting and reporting, and provides valuable background information on $PM_{2.5}$ particulates being transported into the air basin from regions to the north. It will also be extremely useful to monitor fine particulates released during wildfires.

Certification Equipment

The District has received several positive displacement piston provers for gas flow measurement from BIOS. One set is strictly for laboratory use and will replace the LFE's used to certify all our field flow measurement instruments. A second set is for field use and will be used to certify all our $PM_{2.5}$, Toxics, PAMS-Carbonyls, PAMS-VOCs, Carbon, and Metals collection analyzer.

NCore

The District have received several NCore level instruments and we are awaiting the arrival of a Teledyne 700 EU multi-gas calibrator for trace level analyzers, so we can fine tune our procedures. We've added the following analyzers: a Thermo 2025 $PM_{10}$ low volume sequential sampler to be used in conjunction with a Thermo 2025 $PM_{2.5}$ low volume sequential sampler to calculate $PM_{coarse}$; a Thermo 43i Trace level SO2 analyzer; a Thermo 48i Trace level CO analyzer; a Thermo 42i NOy analyzer; a Tanabyte 300t multi-gas calibrator to be the NCore station calibrator.

New Sites / Site Relocations

Alpine

We are in the process of moving the Alpine station. The owners of the land on which the Alpine station resides need to perform major modifications to their water storage facility. With the signing of the MOU on April 30, 2010, an agreement has been reached with local officials to move the Alpine site across the street to the Alpine Cemetery. The District is on track to have the move completed by August 30, 2010.

El Cajon

The passage of the Proposition D bond measure in February of 2008, allows for the expansion of the Lexington Elementary School, the location of the District's El Cajon station. School officials have indicated the District may have to move from our existing location on the school grounds to elsewhere on the premises. As this location is to be the future NCore station, siting may prove to be problematic. The proposed timeline by the El Cajon Valley Union School District is to begin construction by July, 2012, and finish by July, 2014.

Kearny Mesa (Overland)

The Kearny Mesa monitoring station will be displaced, due to renovations at the County Operations Center by 2012. In 2010, the District started parallel sampling with an ozone monitor north-northeast, approximately 0.7 miles from the Kearny Mesa site (near the location of the present Miramar meteorological site).

Miramar (MMR)

See Kearny Mesa (Overland) above.

Otay Mesa

While the present make-up of the District's air monitoring network is considered adequate to meet all 40 CFR requirements, it has become necessary to relocate the Otay Mesa monitoring station (refer to Otay Mesa site description). It was decided to locate the replacement monitoring station at the entrance to the Richard J. Donovan Correctional Facility, approximately one quarter mile due east of the existing $PM_{10}$ site. Agreement with State officials has been reached, an application for building permit has been submitted, and, as of the writing of this report, we are awaiting permission to install a power pole at the chosen site. Barring unforeseen obstacles, the site should be up and running by the end of 2010.

## Proposed Operation Changes to the Network

### CO

For several years the levels of CO have been falling in the SDAB. In 2009, the District received approval to change the operating range of the non-NCore CO monitors from the 0–50 ppm range full scale to the 0–20ppm range full scale. The instruments will be challenged with 3.0 ppm CO gas for precision checks and calibrated with 1000 ppm CO gas for calibrations and audits. This changeover happened in the 1st quarter of 2010.

### $O_3$

For several years the levels of ozone have been declining in the SDAB. In 2009, the District received approval to change the operating range of the ozone monitors from 0 – 1000 ppb full scale to 0-500 ppb full scale. With the addition of NCore calibrators, the Teledyne 700EU, the ozone measuring instruments will be able to be challenged for precision checks, calibrated, and audited below 50 ppb ozone. This could not be reliably done with previous calibrators. This change will take effect in the first quarter of 2011.

This reduction in the operating ranges of the CO and $O_3$ monitors will allow the instruments to more accurately measure the concentrations of those two pollutants seen in the San Diego Air Basin.

## Proposed Instrument Additions to the Network

### Toxics

The District has purchased a Xonteck (formerly Xontech) 910a for use in the Toxics program. It will be placed at the new OTM-Donovan monitoring station and used for parallel sampling against the old OTM station. Once OTM-DVN is activated (4th Qtr 2010), it will be used for collocation purposes (Quality Assurance) with the transfer of equipment from the old OTM station.

### $PM_{2.5}$-continuous

An additional continuous $PM_{2.5}$ sampler in the Otay Mesa region would provide valuable information related to wildfire impact and cross-border transport events; funding is therefore being sought from the EPA to for the procurement of an FEM BAM to be deployed at the new Donovan monitoring station.

### Lead

During a periodic review of the NAAQS for lead, the EPA modified the existing lead standard to 15µg/$m^3$ per quarter, which is at levels the SDAB recorded before lead sampling was ceased several years ago. This lowering of the standard and the addition of NCore requirements may require the District to monitor for lead, beginning January 1, 2011. For a more detailed discussion, refer to Appendix D, The New Lead Standard: 2009.

Proposed Instrument Relocations and site Re-designations

PAMS Re-designations

The San Diego-Overland (KMA) location, soon to be the Miramar site (MMR) is a PAMS Type II, secondary site. The District plans to declassify the KMA/MMR location as a PAMS Type II, secondary site and designate the Escondido location as the new PAMS Type II, secondary site. The Escondido location is along the 15 corridor and adjacent to Highway 78. It will also be located at the easternmost area of the fastest growing location in the SDAB.

Decommissioned Monitors and Sites

CO

As ambient concentrations of criteria pollutants have steadily declined over the years, it has become necessary to de-emphasize some of the NAAQS monitoring that exceeds the CFR requirements for minimum surveillance or for attainment maintenance as outlined in the District's State Implementation Plans. Now, there has been an increased emphasis placed on the monitoring of fine particulates and toxic compounds.

As the Carbon monoxide levels have steadily decreased in the San Diego Air Basin, two of the three CO analyzers the District's operates have become increasingly unnecessary. These two CO monitors are at the Chula Vista and Otay Mesa monitoring sites and will be decommissioned in 2010. The EPA has approved the operation of a single, trace-level CO sampler to be deployed at the proposed El Cajon NCore monitoring site and a single, ambient-level CO sampler at the Escondido monitoring site.

Mount Soledad

Due to equipment and manpower constraints, wind data for Mount Soledad had not been collected since July, 2003. This monitoring was re-established in July, 2007, and continued through 2009. The building that housed the District's Mount Soledad meteorological equipment was shut down by the Department of Health and Safety, due to the discovery of asbestos. As a result of this health danger and closure, the District removed all equipment from this site in the 1st quarter of 2010. The District has no plans to revisit the site for any monitoring.

Proposed Decommissioned Monitors and Sites

$SO_2$

The District is seriously considering the closure of the $SO_2$ monitors at the Chula Vista and Otay Mesa stations.

$NO_2$

Due to the new federal standard of $NO_2$, the District is not considering changing the status of any $NO_2$ monitor in the network at this time.

$PM_{10}$

With the addition of Lo-Vol $PM_{10}$ samplers to fulfill NCore requirements at the El Cajon location, the District proposes the decommissioning of the Hi-Vol $PM_{10}$ sampler at that location. Also, the District is seriously considering decommissioning the Hi-Vol $PM_{10}$ sampler at the Chula Vista location.

## Section 8. Data Submission Requirements

Data submitted to AQS by the District needs to be certified. Precision and Accuracy reports are submitted to the EPA on a quarterly basis. Since 2007, the required certification letter must include a summary report of the precision and accuracy data for each monitor. All Toxics data to be collected at the three Toxics sites will likewise be certified. Certification of PAMS speciated hydrocarbon data began with the 2006 calendar year data submittal to AQS.

The 2008 AQS data was certified on June, 2009.
The 2009 AQS data was certified in May, 2010.

The District's PAMS-VOC data for 2008 is proposed to be submitted to AQS by October, 2010.
The District's PAMS-VOC data for 2009 is proposed to be submitted to AQS by September, 2010.

The District's PAMS-Carbonyl data for 2008 was submitted to AQS in February, 2009.
The District's PAMS-Carbonyl data for 2009, was submitted to AQS in February, 2010.

The District's Toxics-VOC data for 2009 was submitted to AQS in May, 2010.
The District's Toxics-VOC data for 2008 is proposed to be submitted to AQS by December, 2010.

The District's Toxics-Carbon data for 2008 was submitted to AQS by May, 2009.
The District's Toxics-Carbon data for 2009 is proposed to be submitted to AQS by August, 2010.

**Table 10. Data Submittal Schedule**

| | | | 2008 | 2009 |
|---|---|---|---|---|
| DATA SUBMITTAL SCHEDULE | QUARTERLY[6] | $O_3$ | ✓ | ✓ |
| | | $NO_X$ | ✓ | ✓ |
| | | $SO_2$ | ✓ | ✓ |
| | | CO | ✓ | ✓ |
| | | $PM_{10}$ | ✓ | ✓ |
| | | $PM_{2.5}$[1,5] | ✓ | ✓ |
| | | $PM_{10}$ Accuracy | ✓ | ✓ |
| | | $PM_{2.5}$ Accuracy[1] | ✓ | ✓ |
| | | Precision Checks | ✓ | ✓ |
| | YEARLY | Certification Letter | 6/2009 | 5/2010 |
| | | PAMS-Carbonyls | 2/2009 | 2/2010 |
| | | METALS[4] | [4] | [4] |
| | | PAMS-VOCs | by 10/2010 | by 9/2010 |
| | | Carbon | 5/2009 | by 8/2010 |
| | | TOXICS[3] | by 12/2010 | 5/2010 |

✓All quarterly data was submitted within 60-70 days after end of the active quarter.
[1]In addition to submitting $PM_{2.5}$ data for San Diego County, the District submits $PM_{2.5}$ data for the following cities: Mojave and Ridgecrest of Kern County, and Brawley, El Centro, and Calexico of Imperial County.
[2]In addition to submitting $PM_{2.5}$ accuracy results for San Diego County; the District submits $PM_{2.5}$ accuracy results for Calexico of Imperial County.
[3]2007 Toxics data for Quarters 3 & 4 is proposed to be submitted by 12/2010
[4]As of the writing of this report, the District does not have staff to process this backlog.
[5]The 2008 PM2.5 data for the SDAPCD is pending approval from the EPA.
[6]The data is submitted quarterly, but it is reviewed for certification yearly.

## Section 9. Access to More Information about the Network

Additional information regarding San Diego's ambient air quality monitoring network is available from a variety of sources. This information includes pollutant data summaries for the various Network monitors. Much of this information is available on the web. This section lists a number of additional sources for related information, as well as District contact information.

A broad, general overview of ambient air quality data in a question and answer format can be found at the following ARB web page: http://www.arb.ca.gov/aqd/aqfaq/. This web page includes links to various sites, both technical and non-technical.

A wealth of similar information is available on EPA websites, including comprehensive historical information. Sample topics addressed include the following: National Ambient Air Quality Standards, Fine Particle (PM 2.5) Designations, The Plain English Guide to the Clean Air Act, About Air Toxics, Health and Ecological Effects, Air Trends, PAMS Information, Global Warming, Acid Rain, and Stratospheric Ozone.

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. These web 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 the ARB annual network report contains listings of monitoring sites in the State, along with the years for which data are 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.

Summaries of the official air quality data from sites around the State can be found at: http://www.arb.ca.gov/adam/welcome.html. For summaries of the data monitored today, yesterday, last week, or the past 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/aqdpage.htm.

Also available are pages summarizing the National Ambient Air Quality Standards and the California Ambient Air Quality Standards.

Near real-time ambient data, as well as historical data is available on the District's website (http://www.sdapcd.org/). Please take the time to familiarize yourself with the extensive and multi-faceted information available here. Also helpful are: http://airnow.gov/, and at: http://www.epa.gov/ttn/airs/airsaqs/detaildata/downloadaqsdata.htm.

## Agency Contacts

For information regarding this report, and questions related to laboratory operations, the collected ambient air quality data, or quality oversight of the monitoring program contact:

David Shina, Senior Chemist, Ambient Air Section, dshina@sdapcd.org, (858) 586-2768
or
Mahmood Hossain, Chief, Monitoring and Technical Services, mhossain@sdapcd.org, (858) 586-2760

For information about the collection of meteorological data, episode modeling, forecasting and burn permits, contact Bill Brick, Senior Meteorologist, Bill.Brick@sdcounty.ca.gov , (858) 586-2770

## To Comment on this Report:

Hardcopies of this report are available for review at District headquarters. Any comments submitted regarding the content of this report will be forwarded to EPA Region IX. Please submit any comments in writing prior to August 15, 2010, to David Shina, Senior Chemist, Ambient Air Section, dshina@sdapcd.org, or mail/deliver to District headquarters, 10124 Old Grove Road, San Diego, CA, 92131.

# Detailed Site Information

**Site Name: ALPINE**

This site, within the city of Alpine off, W. Victoria Drive is located next to the Padre Dam Municipal Water District's storage reservoir, is the easternmost monitoring site of the network. It was initially established in 1977, having then moved from the Alpine fire station siting. Due to its geographical location, each year the Alpine station records the highest ozone levels within the Air Basin. It is characterized as a PAMS Type III site, intended to monitor maximum ozone concentrations occurring downwind from the area of maximum precursor emissions ($NO_x$ and VOCs). It is also a site used to assess downwind transport of fine particulates ($PM_{2.5}$), as part of ARB's Children's Health Study. $NO_2$ data, collected here since 1981, also supported the Health Study, and continues to provide valuable information on $NO_2$ trends. $NO_2$ trends are an indication of the relative effectiveness of $NO_x$ regulatory and control measures. The Alpine site also provides information used in making burn/no-burn decisions.

| | |
|---|---|
| Site Name | Alpine (ALP) Type III PAMS |
| AQS ID | 060731006 |
| CARB number | 80128 |
| SAROAD - Number | 056820006I01 |
| GIS coordinates | Latitude: 32° 50' 32" N Longitude: 116° 46' 06" W |
| Location | Adjacent to covered water reservoir |
| Address | 2300 W. Victoria Dr. |
| Dist. to road | 10 meters E |
| Traffic count | 500 veh/day |
| Groundcover | Dirt |
| Representative Area | San Diego MSA |
| Operational | 01/13/77 |
| Sources | Victoria Drive; I-8 corridor; transport from San Diego/El Cajon |
| Landmarks | Interstate 8, 1/4 mile south; Cemetery 150 yards east; adjacent to covered water reservoir (Padre Dam Municipal Water Dist.) |
| Elevation above sea level | 622 meters (2041′) |

| | | | | | |
|---|---|---|---|---|---|
| Ambient air analyzers | **$O_3$** TECO 49 | **$NO_x$, $NO_2$** TECO 42C | | | |
| Monitor objective | High Concentration | Representative Concentration | | | |
| Spatial scale | Urban Scale | Urban Scale | | | |
| Sampling method | UV absorption | Chemiluminescence | | | |
| Range full scale | 1 ppm | 1 ppm | | | |
| Start date | 1-13-77 | 4-13-81 | | | |
| Sampling season | Year-round | Year-round | | | |
| Sample line | Teflon | Teflon | | | |

| Sample manifold inlet height above ground | Material | Residence time (Seconds) | Vertical distance from supporting structure | Distance from obstructions on roof / direction | Distance from obstructions not on roof / direction | Distance from trees / direction | Unrestricted airflow (degrees) | Distance to nearest road / direction |
|---|---|---|---|---|---|---|---|---|
| 6.1 meters | Glass | 1.30 | 2.38 m | N/A | 9m E | 30.5m N | 360° | 10m E |

View to South

| Site Name | Alpine (ALP) Type III PAMS | | | | |
|---|---|---|---|---|---|
| Particulate Samplers | **$PM_{2.5}$** MetOne BAM 1020 | | | | |
| Monitor objective | Representative Concentration | | | | |
| Spatial scale | Urban Scale | | | | |
| Analysis method | Beta Attenuation | | | | |
| Start date | 10/24/05 | | | | |
| Operation schedule | Continuous | | | | |
| Sampling season | Year-round | | | | |
| Inlet height above ground | 7.5 meters | | | | |
| Inlet vertical distance from supporting structure | 3.1 meters | | | | |
| Inlet horizontal distance from supporting structure | N/A | | | | |
| Inlet distance from obstructions on roof | N/A | | | | |
| Inlet distance from trees/ direction | 30.5m / N | | | | |
| Inlet distance to furnace or incinerator flue | N/A | | | | |
| Inlet distance between collocated monitors | N/A | | | | |
| Inlet unrestricted airflow | 360° | | | | |
| Is it suitable for comparison against the annual PM2.5? | No | | | | |

| Site Name | Alpine (ALP) Type III PAMS | | | | |
|---|---|---|---|---|---|
| VOC Samplers | **Xontech 910/912** (PAMS) | | | | |
| Monitor objective | Representative Concentration | | | | |
| Spatial scale | Urban Scale | | | | |
| Analysis method | GC-FID | | | | |
| Start date | 1994 | | | | |
| Sampling season | Year-round PAMS Jul-Oct | | | | |
| Operation schedule | 1:6 | | | | |
| Inlet height above ground | 6.1 meters | | | | |
| Inlet vertical distance from supporting structure | 2.5 meters | | | | |
| Inlet horizontal distance from supporting structure | N/A | | | | |
| Inlet distance from obstructions on roof | N/A | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Inlet distance from obstructions not on roof | N/A | | | | |
| Inlet distance from trees / direction | 33.5 meters / N | | | | |
| Inlet distance to furnace or incinerator flue | N/A | | | | |
| Inlet distance between collocated monitors | N/A | | | | |
| Inlet unrestricted airflow | 360º | | | | |

| Site Name | Alpine (ALP) Type III PAMS | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind Speed** Qualimetrics | **Wind Direction** Qualimetrics | **InternalTemp** Qualimetrics | **External Temp** Rotronics | **Rel Humidity** Rotronics |
| Range | 0-50 mph | 0-540 deg | -50 to 50 deg c | -40 to 140 deg F | 0 to 100 % |
| Analysis method | Cup anemometer | Potentiometer | RTD | RTD | Capacitor sensor |
| Start date | 1977 | 1977 | 1977 | 1977 | 1997 |
| Height above ground | 10 meters | 10 meters | N/A | 5.7 meters | 5.7 meters |
| Vertical distance from supporting structure | N/A | N/A | N/A | N/A | N/A |
| Horizontal distance from supporting structure | N/A | N/A | N/A | N/A | N/A |
| Distance from obstructions on roof | N/A | N/A | N/A | N/A | N/A |
| Distance from obstructions not on roof | N/A | N/A | N/A | N/A | N/A |
| Unrestricted airflow | 360º | 360º | N/A | 360º | 360º |

**Site Name: CAMP PENDLETON**

This site, located within the Camp Pendleton Marine Corps Base, sits atop a bluff overlooking the Pacific Ocean. It was established in 1997, having replaced an earlier siting in Oceanside, just east of I-5. The site primarily functions as an upwind, PAMS Type I background characterization site. It is also useful for identifying/confirming cases of over-water ozone transport from the South Coast Air Basin.

| | |
|---|---|
| Site Name | Camp Pendleton (CMP) Type I PAMS |
| AQS ID | 060731008 |
| CARB number | 80198 |
| SAROAD - Number | N/A |
| GIS coordinates | Latitude: 33° 13' 01" N Longitude: 117° 23' 46" W |
| Location | Camp Pendleton Marine Corps Station, parking lot |
| Address | 21441 West B St. |
| Dist. to road | B St (15 meters east); I-5 (365 meters east) |
| Traffic count | 100000 veh/day (I-5) |
| Groundcover | Asphalt, dirt |
| Representative Area | San Diego MSA |
| Operational | April, 1997 |
| Sources | Marine boatyard (275 meters west) |
| Landmarks | |
| Elevation above sea level | 16 meters (53′) |

View to West

| | | | | | |
|---|---|---|---|---|---|
| Ambient air analyzers | **$O_3$** TECO 49 | **$NO_x$, $NO_2$** TECO 42 | | | |
| Monitor objective | Background Levels | Background Levels | | | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | | | |
| Sampling method | UV absorption | Chemiluminescence | | | |
| Range full scale | 1 ppm | 1 ppm | | | |
| Start date | 1997 | 1997 | | | |
| Sampling season | Year-round | Year-round | | | |
| Sample line | Teflon | Teflon | | | |

| Sample manifold inlet height above ground | Material | Residence time (Seconds) | Vertical distance from supporting structure | Distance from obstructions on roof / direction | Distance from obstructions not on roof / direction | Distance from trees / direction | Unrestricted airflow (degrees) | Distance to nearest road / direction |
|---|---|---|---|---|---|---|---|---|
| 6 meters | Glass / Teflon | 8.2 | N/A | N/A | 5.8m / W | 43.9m / SW | 360º | 15m / S |

| Site Name | Camp Pendleton (CMP) Type I PAMS | | | | |
|---|---|---|---|---|---|
| VOC Samplers | **Xontech 910/912** (PAMS) | | | **$PM_{2.5}$** MetOne BAM 1020 | **$PM_{2.5}$** MetOne BAM 1020 FEM |
| Monitor objective | Background Levels | | | Background Levels | Representative Levels |
| Spatial scale | Neighborhood | | | Neighborhood | Neighborhood |
| Analysis method | GC-FID | | | Beta Attenuation | BetaAttenuation |
| Start date | 1997 | | | 6-20-08 – 5-21-09 | 7-27-09 –4/1/10 |
| Operation schedule | 1:6 | | | Continuous | Continuous |
| Sampling season | Year-round PAMS Jul-Oct | | | Year-round | Year-round |
| Inlet height above ground | 5.5 meters | | | | |
| Inlet horizontal distance from supporting structure | N/A | | | | |
| Inlet distance from obstructions on roof | N/A | | | | |
| Inlet distance from obstructions not on roof | 5.8 meters | | | | |
| Inlet distance from trees | 43.9 meters | | | | |
| Inlet distance to furnace or incinerator flue | N/A | | | | |
| Inlet distance between collocated monitors | N/A | | | | |
| Inlet unrestricted airflow | 360º | | | | |
| Is it suitable for comparison against the annual PM2.5? | | | | No | Yes? |

| Site Name | Camp Pendleton (CMP) Type I PAMS | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind speed** Qualimetrics | **Wind Direction** Qualimetrics | **InternalTemp** Qualimetrics | **External Temp** Qualimetrics | |
| Range | 0-50 mph | 0-540 deg | -50 to 50 deg C | -40 to 140 deg F | |
| Analysis method | Cup anemometer | Potentiometer | RTD | RTD | |
| Start date | 1997 | 1997 | 1997 | 1997 | |
| Height above ground | 10 meters | 10 meters | N/A | 5 meters | |
| Vertical distance from supporting structure | N/A | N/A | N/A | N/A | |
| Horizontal distance from supporting structure | N/A | N/A | N/A | N/A | |
| Distance from obstructions on roof | N/A | N/A | N/A | N/A | |
| Distance from obstructions not on roof | N/A | N/A | N/A | N/A | |
| Unrestricted airflow | 360º | 360º | N/A | 360º | |

**Site Name: CHULA VISTA**

This site, located off of East J Street on Chula Vista Elementary School District property immediately south of Chula Vista Fire Station No.2, has been in operation since 1972. The Chula Vista monitoring station was originally established to measure potential impacts from the South Bay power plant to the west-southwest. Over the years, the power plant has significantly reduced emissions (and is working on being decommissioned by 2012) and pollutant spikes are no longer observed. However, after providing more than three decades of data from the same location, the Chula Vista monitoring station has proven to be a strong indicator of air pollutant trends in the southwest portion of San Diego County. This site is also useful for documentation of cross border transport of pollutants from Tijuana, Baja California.

| | |
|---|---|
| Site Name | Chula Vista (CVA) |
| AQS ID | 060730001 |
| CARB number | 80114 |
| SAROAD - Number | 051360001I01 |
| GIS coordinates | Latitude: 32° 37' 52" N Longitude: 117° 03' 33" W |
| Location | parking lot |
| Address | 80 E. J St. |
| Dist. to road | 30 meters NW |
| Traffic count | 2,000 veh/day |
| Groundcover | Paved asphalt |
| Representative Area | San Diego MSA |
| Operational | 01/20/72 |
| Sources | Power plant 2.5 miles WSW (NOx, SO2, THC) |
| Landmarks | 24 meters SSW of fire station and adjacent to junior high school |
| Elevation above sea level | 55 meters (180′) |

View to North

View to West

| Ambient air analyzers | **$O_3$** TECO 49 | **$NO_x$, $NO_2$** TECO 42 | **$SO_2$** TECO 43A | **CO** TECO 48i | |
|---|---|---|---|---|---|
| Monitor objective | Representative Concentration | Representative Concentration | Representative Concentration | Representative Concentration | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | |
| Sampling method | UV absorption | Chemiluminescence | Pulsed Fluorescence | Gas Filter Correlation | |
| Range full scale | 1 ppm | 1 ppm | 1 ppm | 50 ppm | |
| Start date | 1974 | 1974 | 1974 | 1974 | |
| Sampling season | Year-round | Year-round | Year-round | Year-round | |
| Sample line | Teflon | Teflon | Teflon | Teflon | |

| Sample manifold inlet height above ground | Material | Residence time (Seconds) | Vertical distance from supporting structure | Distance from obstructions on roof / direction | Distance from obstructions not on roof / direction | Distance from trees / direction | Unrestricted airflow (degrees) | Distance to nearest road / direction |
|---|---|---|---|---|---|---|---|---|
| 4 meters | Glass | 1.6 | N/A | N/A | N/A | 9.35m /N | 360º | 58m / N |

| Site Name | Chula Vista (CVA) | | | | |
|---|---|---|---|---|---|
| Particulate Samplers | **$PM_{10}$ (ARB)** GMWL 2000H w/SA1200 head | **$PM_{2.5}$** R&P Partisol-Plus 2025 | | | |
| Monitor objective | Representative Concentration | Representative Concentration | | | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | | | |
| Analysis method | Gravimetric; CARB lab thru 8/4/08, then SD lab | Low volume sequential sampler; SSI | | | |
| Start date | 1986 | 1999 | | | |
| Operation schedule | 1:6 | 1:3 | | | |
| Sampling season | Year-round | Year-round | | | |
| Inlet height above ground | 5.4 meters | 6 meters | | | |
| Inlet vertical distance from supporting structure | 1.5 meters | 2.1 meters | | | |
| Inlet horizontal distance from supporting structure | N/A | N/A | | | |
| Inlet distance from obstructions on roof | N/A | N/A | | | |
| Inlet distance from obstructions not on roof | N/A | N/A | | | |
| Inlet distance from trees | 4 meters | 6 meters | | | |
| Inlet distance to furnace or incinerator flue | N/A | N/A | | | |
| Inlet distance between collocated monitors | N/A | N/A | | | |
| Inlet unrestricted airflow | 360º | 360º | | | |
| Is it suitable for comparison against the annual PM2.5? | N/A | Yes | | | |

| Site Name | Chula Vista (CVA) | | | | |
|---|---|---|---|---|---|
| Toxics Samplers | **Xontech 910A** | **Xontech 924** | | | |
| Monitor objective | Representative Concentration | Representative Concentration | | | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | | | |
| Analysis method | GC-FID CARB | CARB lab | | | |
| Start date | 1988 | 1988 | | | |
| Operation schedule | 1:12 | 1:12 | | | |
| Sampling season | Year-round | Year-round | | | |
| Inlet height above ground | 8.6 meters | 6 meters | | | |
| Inlet vertical distance from supporting structure | 2 meters | 2 meters | | | |
| Inlet horizontal distance from supporting structure | N/A | N/A | | | |
| Inlet distance from obstructions on roof | N/A | N/A | | | |
| Inlet distance from obstructions not on roof | N/A | N/A | | | |
| Inlet distance from trees | 10 meters NW | 7 meters NW | | | |
| Inlet distance to furnace or incinerator flue | N/A | N/A | | | |
| Inlet distance between collocated monitors | N/A | N/A | | | |
| Inlet unrestricted airflow | 360º | 360º | | | |

| Site Name | Chula Vista (CVA) | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind Speed** Qualimetrics | **Wind Direction** Qualimetrics | **InternalTemp** Qualimetrics | **External Temp** Rotronics | |
| Range | 0-50 mph | 0-540 deg | -50 to 50 deg C | -40 to 140 deg F | |
| Analysis method | Cup anemometer | Potentiometer | RTD | RTD | |
| Start date | 1-20-72 | 1-20-72 | | 1998 | |
| Height above ground | 10 meters | 10 meters | N/A | 5.4 meters | |
| Vertical distance from supporting structure | N/A | N/A | N/A | N/A | |
| Horizontal distance from supporting structure | N/A | N/A | N/A | N/A | |
| Distance from obstructions on roof | N/A | N/A | N/A | N/A | |
| Distance from obstructions not on roof | N/A | N/A | N/A | N/A | |
| Unrestricted airflow | 360º | 360º | N/A | 360º | |

**Site Name: DEL MAR**

This small site is located just off Stratford Court on the school grounds parking lot at Mira Costa College (Winston School). Monitoring commenced in 1983, when the station was moved from an earlier location in Solana Beach (the next city to the North). The primary function of this site is to monitor background levels of ozone on non-transport days, and to measure ozone concentrations during periods of over-water transport from the South Coast Air Basin. This site has been an useful indicator of the progress made by SCAQMD (north of us) in their battle against air pollution.

View to Southwest

View to North

| | |
|---|---|
| Site Name | Del Mar (DMR) |
| AQS ID | 060731001 |
| CARB number | 80133 |
| SAROAD - Number | 0519800001I01 |
| GIS coordinates | Latitude: 32° 57' 08" N Longitude: 117° 15' 51" W |
| Location | School parking lot |
| Address | 225 9th St. |
| Dist. to road | Stratford (10 meters) |
| Traffic count | 3,000 veh/day |
| Groundcover | Asphalt |
| Representative Area | San Diego MSA |
| Operational | 10/14/1983 |
| Sources | Transport |
| Landmarks | Pacific Ocean 230 meters to west; Mira Costa College,18 m. east |
| Elevation above sea level | 39 meters (129´) |
| Declination | 12° 22' E |

| | | | | | |
|---|---|---|---|---|---|
| Ambient air analyzers | **$O_3$** TECO 49 | | | | |
| Monitor objective | High Concentration | | | | |
| Spatial scale | Neighborhood Scale | | | | |
| Sampling method | UV absorption | | | | |
| Range full scale | 1 ppm | | | | |
| Start date | October, 1983 | | | | |
| Sampling season | Year-round | | | | |
| Sample line | Teflon | | | | |
| | | | | | |

| Sample manifold inlet height above ground | Material | Residence time (Seconds) | Vertical distance from supporting structure | Distance from obstructions on roof / direction | Distance from obstructions not on roof / direction | Distance from trees / direction | Un-restricted airflow (degrees) | Distance to nearest road / direction |
|---|---|---|---|---|---|---|---|---|
| 3.8 meters | Teflon, 6 meters | 3.25 | 0.6 meters | N/A | N/A | 7.6m SW | 360º | 10m /W |

| Site Name | Del Mar (DMR) | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind Speed** Qualimetrics | **Wind Direction** Qualimetrics | **InternalTemp** Qualimetrics | | |
| Range | 0-50 mph | 0-540 deg | -50 to 50 deg C | | |
| Analysis method | Cup anemometer | Potentiometer | RTD | | |
| Start date | 1983 | 1983 | 1983 | | |
| Height above ground | 10 meters | 10 meters | N/A | | |
| Vertical distance from supporting structure | N/A | N/A | N/A | | |
| Horizontal distance from supporting structure | N/A | N/A | N/A | | |
| Distance from obstructions on roof | N/A | N/A | N/A | | |
| Distance from obstructions not on roof | N/A | N/A | N/A | | |
| Unrestricted airflow | 360º | 360º | N/A | | |

**Site Name: DONOVAN**

This site is situated at the entrance to the Richard J. Donovan Correctional Facility. It is primarily in use to complement the District's $PM_{10}$ sampling at the Otay Mesa border crossing location, which is now so unduly influenced by the tremendous increase in cross-border truck traffic as to no longer be representative of regional conditions. The District plans to move the existing Otay Mesa monitoring station to the Donovan facility in late 2010. Comparative particulate monitoring began here in January, 2005. Although the federal "annual mean" $PM_{10}$ standard was revoked effective December 16, 2006, due to lack of evidence linking health problems to long-term coarse particle exposure, the state standards have been maintained. Should the necessity ever arise to demonstrate attainment for $PM_{10}$ in this part of the air basin, this Donovan database will prove crucial. The sole monitor at this location, at the present, is a $PM_{10}$ sampler.

| | |
|---|---|
| Site Name | Donovan (DVN) |
| AQS ID | 060731014 |
| CARB number | N/A |
| SAROAD - Number | N/A |
| GIS coordinates | Latitude: 32° 34' 46" N Longitude: 116° 55' 46" W |
| Location | Entrance gate, Richard J. Donovan Correctional Facility |
| Address | 476 Alta Rd. |
| Dist. to road | 6 meters to gravel rd, 11 meters to paved rd |
| Traffic count | Correctional Facility-related traffic only |
| Groundcover | Grassy soil |
| Representative Area | San Diego MSA |
| Operational | January, 2005 |
| Sources | N/A |
| Landmarks | R. J. Donovan Correctional Facility |
| Elevation above sea level | 185 meters (606 ) |

View to West

View to East

| Site Name | Donovan (DVN) | | | | |
|---|---|---|---|---|---|
| Particulate Samplers | **$PM_{10}$** GMWL 2000H w/SA1200 head | | | | |
| Monitor objective | Representative Concentration | | | | |
| Spatial scale | Neighborhood Scale | | | | |
| Analysis method | High volume, size selective inlet | | | | |
| Start date | January, 2005 | | | | |
| Operation schedule | 1:6 | | | | |
| Sampling season | Year-round | | | | |
| Inlet height above ground | 2.5 meters | | | | |
| Inlet vertical distance from supporting structure | 1.5 meters | | | | |
| Inlet horizontal distance from supporting structure | N/A | | | | |
| Inlet distance from obstructions on roof | N/A | | | | |
| Inlet distance from obstructions not on roof | N/A | | | | |
| Inlet distance from trees | N/A | | | | |
| Inlet distance to furnace or incinerator flue | N/A | | | | |
| Inlet distance between collocated monitors | N/A | | | | |
| Inlet unrestricted airflow | 360º | | | | |

**Site Name: SAN DIEGO – BEARDSLEY STREET ("Downtown")**

This site lies in the western corner of the Main Street parking lot for Perkins Elementary School. The present location is near the San Diego – Logan Avenue site which was operated by the ARB as part of an Environmental Justice project running from October 1999 through February 2001. The San Diego-downtown site has always been an important component of the Air Monitoring Network. The site itself has moved around the downtown area repeatedly since the inception of the San Diego's Air Pollution Control District in 1955. More recently it has been located at the Island Avenue Detoxification Center (70's and 80's), moved across the street to the San Diego Police Department garage in 1989, and to its present location in July, 2005.

This site is fairly well-centered in the heart of the Downtown/South Bay industrial zone, being exposed to emissions (depending upon wind direction) from Interstates 5 and 805, State Highways 15 and 94, Petco Park, downtown San Diego, Lindbergh Field, North Island Naval Air Station, 10th Avenue and 32nd Street marine terminals, NASSCO shipyards, Southwest Marine, train yards, and harbor ship traffic. Forecasting of $PM_{2.5}$ levels for several monitoring sites (from Chula Vista to Kearny Mesa) is partially based upon the values collected at this site. This location is useful for capturing high $NO_2$ concentrations, and has frequently been of value when assessing ozone transport from the south (Baja, Mexico). It provides pollutant concentrations representative of surrounding population centers.

| | |
|---|---|
| Site Name | San Diego – Beardsley Street (DTN) |
| AQS ID | 060731010 |
| CARB number | 80142 |
| SAROAD - Number | N/A |
| GIS coordinates | Latitude: 32° 42' 05 " N Longitude: 117° 08' 59 " W |
| Location | Perkins Elementary School parking lot |
| Address | 1110a Beardsley St, San Diego, Ca 92113 |
| Dist. to road | Sigsbee St (7.6 meters NW); Main (20.4 meters SW) |
| Traffic count | 5,000 veh/day |
| Groundcover | Asphalt |
| Representative Area | San Diego MSA |
| Operational | 7/14/2005 |
| Sources | See description above |
| Landmarks | |
| Elevation above sea level | 8 meters (26´) |
| Declination | 12° 17' E |

| Site Name | San Diego – Beardsley Street (DTN) | | | | |
|---|---|---|---|---|---|
| Ambient air analyzers | **$O_3$** TECO 49 | **$NO_x$, $NO_2$** TECO 42 | **$SO_2$** TECO 43A | **CO** ML 8830 | |
| Monitor objective | Representative Concentration | Representative Concentration | Representative Concentration | Representative Concentration | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | |
| Sampling method | UV absorption | Chemiluminescence | Pulsed Fluorescence | Gas Filter Correlation | |
| Range full scale | 1 ppm | 1 ppm | 1 ppm | 50 ppm | |
| Start date | July, 2005 (1972) | July, 2005 (1972) | July, 2005 (1972) | July, 2005 (1972) | |
| Sampling season | Year-round | Year-round | Year-round | Year-round | |
| Sample line | Teflon | Teflon | Teflon | Teflon | |
| Inlet distance from obstructions on roof | N/A | N/A | N/A | N/A | |
| Inlet distance from obstructions not on roof | N/A | N/A | N/A | N/A | |
| Inlet distance from trees | 18.3 meters / S | 18.9 meters / S | 20.7 meters / S | 13.3m S | |
| Inlet distance to furnace or incinerator flue | N/A | N/A | N/A | N/A | |
| Inlet distance between collocated monitors | N/A | N/A | N/A | N/A | |
| Inlet unrestricted airflow | 360º | 360º | 360º | 360º | |
| Is it suitable for comparison against the annual PM2.5? | N/A | Yes | No | N/A | |

View to West, with deck view of PM2.5 and $PM_{10}$ samplers, and XonTech 924

View to Northwest

| Site Name | San Diego – Beardsley Street (DTN) | | | | |
|---|---|---|---|---|---|
| Toxics Samplers | **XonTech 910A** | **XonTech 924** | | | |
| Monitor objective | Representative Concentration | Representative Concentration | | | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | | | |
| Analysis method | GC-MS | ICP-MS | | | |
| Start date | Jan, 2007 | July, 2005 (1994) | | | |
| Operation schedule | 1:6 | 1:12 | | | |
| Sampling season | Year-round | Year-round | | | |
| Height above ground | 5.6 meters | 5.6 meters | | | |
| Vertical distance from supporting structure | 2 meters | 2 meters | | | |
| Horizontal distance from supporting structure | N/A | N/A | | | |
| Distance from obstructions on roof | N/A | N/A | | | |
| Distance from obstructions not on roof | N/A | N/A | | | |
| Distance from trees | 18.3 meters | 17 meters | | | |
| Distance to furnace or incinerator flue | N/A | N/A | | | |
| Distance between collocated monitors | N/A | N/A | | | |
| Unrestricted airflow | 360º | 360º | | | |
| Sample line | Silcosteel-coated stainless steel | N/A | | | |

| Site Name | San Diego – Beardsley Street (DTN) | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind Speed** Qualimetrics | **Wind Direction** Qualimetrics | **InternalTemp** Qualimetrics | **External Temp** Qualimetrics | |
| Range | 0-50 mph | 0-540 deg | -50 to 50 deg C | -58 to 122 deg F | |
| Analysis method | Cup anemometer | Potentiometer | RTD | RTD | |
| Start date | July, 2005 | July, 2005 | July, 2005 | July, 2005 | |
| Height above ground | 10 meters | 10 meters | N/A | 5.5 meters | |
| Vertical distance from supporting structure | N/A | N/A | N/A | N/A | |
| Horizontal distance from supporting structure | N/A | N/A | N/A | N/A | |
| Distance from obstructions not on roof | N/A | N/A | N/A | N/A | |
| Unrestricted airflow | 360º | 360º | N/A | 360º | |

**Site Name: EL CAJON**

This site sits immediately off of Redwood Avenue, within the northeastern portion of the Lexington Elementary School schoolyard. Monitoring began here in 1981, when the site moved from atop the courthouse on E. Lexington Avenue. The El Cajon site represents a major population center located in an inland valley, downwind of the heavily populated coastal zone. It is impacted from the transportation corridor of Interstate 8 and its major arteries. It is classified as a PAMS Type II site, being a maximum ozone precursor emissions impact site. Such sites are established to monitor the magnitude and type of precursor emissions in the area where maximum precursor emissions representative of the MSA are expected to impact and are suited for the monitoring of urban air toxic pollutants. Type II sites are located immediately downwind (using the same morning wind direction as for locating Type I sites) of the area of maximum precursor emissions and are typically placed near the downwind boundary of the central business district or primary area of precursor emissions mix to obtain neighborhood scale measurements.

Data from this site are extremely useful for modeling purposes, providing a measure of the degree to which ozone precursors have been engaged in active photochemistry leading to ozone formation.

| | |
|---|---|
| Site Name | El Cajon (ECA) Type II PAMS |
| AQS ID | 060730003 |
| CARB number | 80131 |
| SAROAD - Number | 052220003I01 |
| GIS coordinates | Latitude: 32° 47' 28" N Longitude: 116° 56' 32" W |
| Location | Site on Lexington Elementary School |
| Address | 1155 Redwood Ave, San Diego |
| Dist. to road | Redwood Ave (7.5 meters N ); Ballard St (60 meters E ) |
| Traffic count | 2,000 veh/day |
| Groundcover | Dirt, gravel |
| Representative Area | San Diego MSA |
| Operational | 09/03/81 |
| Sources | Residential, school traffic |
| Landmarks | Lexington Elementary School |
| Elevation above sea level | 144 meters (472 ) |

View to West from deck (clockwise from lower left): MetOne XonTech 924, URG3000-N carbon sampler, R&P Partisol-Plus $PM_{2.5}$, MetOne BAM-1020, and MetOne SASS

View to East from deck (clockwise from lower left): MetOne BAM 1020, MetOne SASS, Sierra-Andersen $PM_{10}$, XonTech 924, and URG3000N

View to the Southeast

| Site Name | El Cajon (ECA) Type II PAMS | | | | |
|---|---|---|---|---|---|
| Ambient air analyzers | **O3** TECO 49 | **NOx, NO2** TECO 42C | | | |
| Monitor objective | Representative Concentration | Source Impact | | | |
| Spatial scale | Neighborhood Scale | Urban Scale | | | |
| Sampling method | UV absorption | Chemiluminescence | | | |
| Range full scale | 1 ppm | 1 ppm | | | |
| Start date | September,1981 | September,1981 | | | |
| Sampling season | Year-round | Year-round | | | |
| Sample line | Teflon | Teflon | | | |

| Sample manifold inlet height above ground | Material | Residence time (Seconds) | Vertical distance from supporting structure | Distance from obstructions on roof / direction | Distance from obstructions not on roof / direction | Distance from trees / direction | Unrestricted airflow (degrees) | Distance to nearest road / direction |
|---|---|---|---|---|---|---|---|---|
| 6.6 meters | Glass | 1.2 | 1.8 meters | N/A | N/A | 12.2 m W; 16.6 m N | 360º | 7.5 m / N |

| Site Name | El Cajon (ECA) Type II PAMS | | | | |
|---|---|---|---|---|---|
| Toxics/VOC Samplers | **Xontech 910/912** (PAMS) | **Xontech 910** | **Xontech 924** | **Xontech 925** (PAMS) | |
| Monitor objective | Representative Concentration | Representative Concentration | Representative Concentration | Representative Concentration | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | |
| Analysis method | GC-FID | CARB lab | CARB lab | HPLC | |
| Start date | 1993 | 1988 | 1989 $Cr^{+6}$ 3/4/87 | 1-1-93 | |
| Operation schedule | 1:6 | 1:12 | 1:12 | 1:6 | |
| Sampling season | Year-round PAMS Jul-Oct | Year-round | Year-round | Year-round PAMS Jul-Oct | |
| Inlet height above ground | 5.5 meters | 5.5 meters | 5.6 meters | 5.5 meters | |
| Inlet vertical distance from supporting structure | 1.8 meters | 1.8 meters | 2 meters | 1.8 meters | |
| Inlet horizontal distance from supporting structure | N/A | N/A | N/A | N/A | |
| Inlet distance from obstructions on roof | N/A | N/A | N/A | N/A | |
| Inlet distance from obstructions not on roof | N/A | N/A | N/A | N/A | |
| Inlet distance from trees/ direction | 18 meters / E | 18 meters / E | 18.5 meters / E | 18 meters / E | |
| Inlet distance between collocated monitors | .3 meters | .3 meters | N/A | N/A | |

| | | | | | |
|---|---|---|---|---|---|
| Inlet unrestricted airflow | 360º | 360º | 360º | 360º | |

| Site Name | El Cajon (ECA) Type II PAMS | | | | | |
|---|---|---|---|---|---|---|
| Particulate Samplers | **$PM_{10}$** GMWL 2000H w/SA1200 head | **$PM_{2.5}$** R&P Partisol-Plus 2025 | **$PM_{2.5}$** MetOne SASS CH 1-3 | **$PM_{2.5}$** MetOne SASS CH 4 | **$PM_{2.5}$** URG3000-N | **$PM_{2.5}$** MetOne BAM 1020 |
| Monitor objective | High Concentrations | Representative Concentration | STN | Representative Concentration | STN | Representative Concentration |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale |
| Analysis method | Gravimetric; CARB lab thru 8/4/08, then SD lab | gravimetric SDAPCD lab | RTI lab | DRI 2001A Thermal/Optical Carbon Analyzer | RTI lab | Beta Particle Attenuation |
| Start date | 9-25-86 | 1-1-99 | | 2/24/08 | 5/3/07 | 7/24/07 |
| Operation schedule | 1:6 | 1:3 | 1:3 | 1:6 | 1:3 | Continuous |
| Sampling season | Year-round | Year-round | Year-round | Year-round | Year-round | Year-round |
| Inlet height above ground | 5.1 meters | 5.7 meters | 5.5 meters | 5.7 meters | 5.7 meters | 6.0 meters |
| Inlet vertical distance from supporting structure | 1.5 meters | 2.1 meters | 1.8 meters | 2.1 meters | 2.1 meters | 2.4 meters |
| Inlet horizontal distance from supporting structure | N/A | N/A | N/A | N/A | N/A | N/A |
| Inlet distance from obstructions on roof | N/A | N/A | N/A | N/A | N/A | N/A |
| Inlet distance from obstructions not on roof | N/A | N/A | N/A | N/A | N/A | N/A |
| Inlet distance from trees / direction | 16 meters / N | 12 meters / W | 16 meters / N | 15 meters / W | 15 meters / W | 14 meters/ W |
| Inlet distance to furnace or incinerator flue | N/A | N/A | N/A | N/A | N/A | N/A |
| Inlet distance between collocated monitors | N/A | N/A | 4 meters to the URG3000-N | 4 meters to the PM2.5 SASS | 4 meters to the PM2.5 SASS | 1.7 meters to the R&P 2025 |
| Inlet unrestricted airflow | 360º | 360º | 360º | 360º | 360º | 360º |
| Is it suitable for comparison against the annual PM2.5? | N/A | Yes | No | N/A | N/A | No |

| Site Name | El Cajon (ECA) Type II PAMS | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind Speed** Qualimetrics | **Wind Direction** Qualimetrics | **InternalTemp** Qualimetrics | **External Temp** Rotronics | **Rel Humidity** Rotronics |
| Range | 0-50 mph | 0-540 deg | -50 to 50 deg c | -40 to 140 deg f | 0 to 100 % |
| Analysis method | Cup anemometer | Potentiometer | RTD | RTD | Capacitor sensor |
| Start date | 8-20-81 | 8-20-81 | 8-27-81 | 8-27-81 | |
| Height above ground | 10 meters | 10 meters | N/A | 5.3 meters | 5.3 meters |
| Vertical distance from supporting structure | N/A | N/A | N/A | N/A | N/A |
| Horizontal distance from supporting structure | N/A | N/A | N/A | N/A | N/A |
| Distance from obstructions on roof | N/A | N/A | N/A | N/A | N/A |
| Distance from obstructions not on roof | N/A | N/A | N/A | N/A | N/A |
| Unrestricted airflow | 360º | 360º | N/A | 360º | 360º |

Deck-view to Northwest, looking through XonTech 924

**Site Name: ESCONDIDO**

This site is located near the center of Escondido, off of East Valley Parkway, in the parking lot of the County Public Health Center. The Escondido site represents a major population center for the Inland North County/I-15 Corridor. It has been at this same location for 35 years, providing a trends database over the decades that North County has witnessed tremendous growth. It is a receptor of emissions from the Highway 78 communities, their associated base of small business and industry, and vehicular traffic in the Highway 78 and I-15 corridors. Its inland location is comparable to the El Cajon site; it provides valuable data concerning the fate of coastal zone/I-5 emissions, which react in sunlight to form ozone as they are carried eastward with prevailing winds. This site is also extremely important for estimating concentrations of carbon monoxide and particulate matter in the heavily populated North County region. Data from this site facilitates burn/no-burn decisions. In addition, the Escondido site captures occasional transport from the north down the I-15 corridor. This site has the only collocated BAMS samplers in the network.

| | |
|---|---|
| Site Name | Escondido (ESC) |
| AQS ID | 060731002 |
| CARB number | 80115 |
| SAROAD - Number | 052460002I01 |
| GIS coordinates | Latitude: 33° 07' 40" N Longitude: 117° 04' 31" W |
| Location | Next to parking lot |
| Address | 600 E. Valley Pkwy |
| Dist. to road | Fig street ( 89.3 meters NE) ; Valley Pkwy ( 96 meters SW) |
| Traffic count | 15,000 veh/day |
| Groundcover | Dirt/asphalt |
| Representative Area | San Diego MSA |
| Operational | May, 1972 |
| Sources | Hospital, traffic, Interstate 163, 1 mile west (Hwy. 395) |
| Landmarks | Interstate 163, 1 mile west (Hwy. 395) |
| Elevation above sea level | 200 meters (656 ) |

| Ambient air analyzers | **$O_3$** TECO 49 | **$NO_x$, $NO_2$** TECO 42 | **CO** ML 8830 | | |
|---|---|---|---|---|---|
| Monitor objective | Representative Concentration | Representative Concentration | Representative Concentration | | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | | |
| Sampling method | UV absorption | Chemiluminescence | Gas Filter Correlation | | |
| Range full scale | 1 ppm | 1 ppm | 50 ppm | | |
| Start date | 11-21-73 | 6-1-74 | 10-29-79 | | |
| Sampling season | Year-round | Year-round | Year-round | | |
| Sample line | Teflon | Teflon | Teflon | | |

| Sample manifold inlet height above ground | Material | Residence time (Seconds) | Vertical distance from supporting structure | Distance from obstructions on roof / direction | Distance from obstructions not on roof / direction | Distance from trees / direction | Un-restricted airflow (degrees) | Distance to nearest road / direction |
|---|---|---|---|---|---|---|---|---|
| 7 meters | Glass | 3 | 3 m | N/A | N/A | 21.3m E | 360º | 89.3m NE |

Deck-view to East, showing MetOne SASS, MetOne BAM 1020, and Andersen RASS (now an R&P sampler)

Deck-view to South, showing $PM_{10}$ and URG-3000N

View to the East

| Particulate Samplers | **$PM_{2.5}$** R&P Partisol-Plus 2025 | **$PM_{2.5}$** MetOne SuperSASS CH 1,2,4 | **$PM_{2.5}$** MetOne SuperSASS CH 3 | **$PM_{2.5}$** URG3000-N | **$PM_{2.5}$** MetOne BAM 1020 FEM | **$PM_{2.5}$** MetOne Co-BAM[1] 1020 |
|---|---|---|---|---|---|---|
| Monitor objective | Representative Concentration | STN | Representative Concentration | STN | Representative Concentration | Representative Concentration |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale |
| Analysis method | Gravimetric SDAPCD lab | CARB lab | DRI 2001A Thermal/Optical Carbon Analyzer | CARB lab | Beta particle attenuation | Beta particle attenuation |
| Start date | 1-1-99 | | 3/1/08 | 5-21-07 | 2-22-05 (FEM 6-20-08) | 2-22-05 |
| Operation schedule | 1:3 | 1:6 | 1:6 | 1:6 | Continuous | Continuous |
| Sampling season | Year-round | Year-round | Year-round | Year-round | Year-round | Year-round |
| Inlet height above ground | 5.8 meters | 6 meters | 6 meters | 6 meters | 6.0 meters | 6.0 meters |
| Inlet vertical distance from supporting structure | 2 meters | 2 meters | 2 meters | 2 meters | 2.5 meters | 2.5 meters |
| Inlet horizontal distance from supporting structure | N/A | N/A | N/A | N/A | N/A | N/A |
| Inlet distance from obstructions on roof | N/A | N/A | N/A | N/A | N/A | N/A |
| Inlet distance from obstructions not on roof | N/A | N/A | N/A | N/A | N/A | N/A |
| Inlet distance from trees | 24.4 meters | 24.4 meters | 24.4 meters | 24.4 meters | 24.4 meters | 24.4 meters |
| Inlet distance to furnace or incinerator flue | N/A | N/A | N/A | N/A | N/A | N/A |
| Inlet distance between collocated monitors (Effective 4/09) | 1.4m to URG<br>3.1m to SASS<br>1.1m to BAM<br>1.1m to Co-BAM<br>4.0m to $PM_{10}$ | 1.8m to URG<br>4.1m to BAM<br>4m to Co-BAM<br>6.3m to $PM_{10}$<br>3.1m to 2025 | 1.8m to URG<br>4.1m to BAM<br>4m to Co-BAM<br>6.3m to $PM_{10}$<br>3.1m to 2025 | 1.8m to SASS<br>1.4m to 2025<br>2.5m to BAM<br>3.7m to Co-BAM<br>5.0m to $PM_{10}$ | 1.4m to Co-BAM<br>2.5m to URG<br>4.1m to SASS<br>1.1m to 2025<br>3.3m to $PM_{10}$ | 1.4m to BAM<br>3.7m to URG<br>4m to SASS<br>1.1m to 2025<br>4.6m to $PM_{10}$ |
| Inlet unrestricted airflow | 360º | 360º | 360º | 360º | 360º | 360º |
| Is it suitable for comparison against the annual PM2.5? | Yes | No | No | N/A | Yes? | No |

[1] The Co-BAM (a non-FEM BAM) was moved closer to the FEM BAM on 4/8/2009

| Site Name | Escondido (ESC) | | | | | |
|---|---|---|---|---|---|---|
| Particulate Samplers | **$PM_{10}$** GMWL 2000H w/SA1200 head | | | | | |
| Monitor objective | Representative Concentration | | | | | |
| Spatial scale | Neighborhood Scale | | | | | |
| Analysis method | Gravimetric | | | | | |
| Start date | 9-4-91 | | | | | |
| Operation schedule | 1:6 | | | | | |
| Sampling season | Year-round | | | | | |
| Inlet height above ground | 5.3 meters | | | | | |
| Inlet vertical distance from supporting structure | 1.5 meters | | | | | |
| Inlet horizontal distance from supporting structure | N/A | | | | | |
| Inlet distance from obstructions on roof | N/A | | | | | |
| Inlet distance from obstructions not on roof | meters | | | | | |
| Inlet distance from trees | 24.4 meters | | | | | |
| Inlet distance to furnace or incinerator flue | N/A | | | | | |
| Inlet distance between collocated monitors | N/A | | | | | |
| Inlet unrestricted airflow | 360º | | | | | |
| Is it suitable for comparison against the annual PM2.5? | N/A | | | | | |

| Site Name | Escondido (ESC) | | | | |
|---|---|---|---|---|---|
| Toxic Samplers | **Xontech 910 A** | | | | |
| Monitor objective | Representative Concentration | | | | |
| Spatial scale | Neighborhood Scale | | | | |
| Analysis method | GC-MS | | | | |
| Start date | January, 2007 | | | | |
| Operation schedule | 1:6 | | | | |
| Sampling season | Year-round | | | | |
| Inlet height above ground | 5.8 meters | | | | |
| Inlet vertical distance from supporting structure | N/A | | | | |
| Inlet horizontal distance from supporting structure | N/A | | | | |
| Inlet distance from obstructions on roof | N/A | | | | |
| Inlet distance from obstructions not on roof | N/A | | | | |
| Inlet distance from trees / direction | 25m / E | | | | |
| Inlet distance to furnace or incinerator flue | N/A | | | | |
| Inlet distance between collocated monitors | N/A | | | | |
| Inlet unrestricted airflow | 360º | | | | |
| Sample line | Silcosteel-coated stainless steel | | | | |

| Site Name | Escondido (ESC) | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind Speed** Qualimetrics | **Wind Direction** Qualimetrics | **InternalTemp** Qualimetrics | **External Temp** Rotronics | |
| Range | 0-50 mph | 0-540 deg | -50 to 50 deg C | -58 to 122 deg F | |
| Analysis method | Cup anemometer | Potentiometer | RTD | RTD | |
| Start date | 6-1-74 | 6-1-74 | | 2-20-75 | |
| Height above ground | 10 meters | 10 meters | N/A | 5 meters | |
| Vertical distance from supporting structure | N/A | N/A | N/A | N/A | |
| Horizontal distance from supporting structure | N/A | N/A | N/A | N/A | |
| Distance from obstructions on roof | N/A | N/A | N/A | N/A | |
| Distance from obstructions not on roof | N/A | N/A | N/A | N/A | |
| Unrestricted airflow | 360º | 360º | N/A | 360º | |

**Site Name: SAN DIEGO – OVERLAND AVENUE (Kearny Mesa)**

This site is located in the northeast corner of the County Operations Center in Kearny Mesa. Due to its proximity to major transportation corridors and population centers, it is able to provide representative concentration data for a significantly large area. Like the El Cajon monitoring station, it is classified as a PAMS Type II site (refer to El Cajon site description for further information). Monitors are in place to sample ozone and its precursors ($NO_x$/$NO_2$, PAMS compounds, and Carbonyl compounds). Solar radiation is measured here, representing those portions of the County where reactive photochemistry will occur most extensively.

In some respects the San Diego - Overland site provides some background information for the offshore waters as this site gets frequent intrusions of marine air along the SR52 corridor (through the Mount Soledad gap); this site has the lowest $PM_{2.5}$ average measured in San Diego County. This site also is critical to the Air Network's quality assurance program, running collocated samplers for $PM_{10}$, $PM_{2.5}$ and PAMS compounds.

The Kearny Mesa monitoring station will be displaced due to renovations at the County Operations Center by 2012. In 2010, the District started parallel sampling with an ozone monitor north-northeast near the location of the present Miramar (MMR) meteorological site. Approximately, 0.7 miles from the Kearny Mesa site.

| | |
|---|---|
| Site Name | San Diego-Overland Ave aka Kearny Mesa (KMA) |
| AQS ID | 060730006 |
| CARB number | 80123 |
| SAROAD - Number | 056800006I01 |
| GIS coordinates | Latitude: 32° 50' 11" N Longitude: 117° 07' 43" W |
| Location | Northeast County Operations Center parking lot |
| Address | 5555 Overland Ave., San Diego |
| Dist. to road | Hazard Way (85 meters SE) ; Chesapeake Drive (174 meters N) |
| Traffic count | 700 veh/day (Hazard Way) |
| Groundcover | asphalt |
| Representative Area | San Diego MSA |
| Operational | April 1, 1974 |
| Sources | USMC Air Station/aircraft, Miramar Landfill, COC Parking lot, Interstates 805 and 15, State Routes 52 and 163 |
| Landmarks | Miramar Marine Corps Air Station 2 miles NNW |
| Elevation above sea level | 127 meters (418 ) |

| | | | | | |
|---|---|---|---|---|---|
| Ambient air analyzers | **$O_3$** TECO 49 | **$NO_x$, $NO_2$** TECO 42 | | | |
| Monitor objective | Representative Concentration | Representative Concentration | | | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | | | |
| Sampling method | UV absorption | Chemiluminescence | | | |
| Range full scale | 1 ppm | 1 ppm | | | |
| Start date | 4-1-74 | 4-1-74 | | | |
| Sampling season | Year-round | Year-round | | | |
| Sample line | Teflon | Teflon | | | |

| Sample manifold inlet height above ground | Material | Residence time (Seconds) | Vertical distance from supporting structure | Distance from obstructions on roof / direction | Distance from obstructions not on roof / direction | Distance from trees / direction | Un-restricted airflow (degrees) | Distance to nearest road / direction |
|---|---|---|---|---|---|---|---|---|
| 6.57 | Glass | 2.48 | 2.6 m | N/A | N/A | 22m / S | 360º | 85 / SE 174 / N |

West view, PM10 samplers and wind monitor

Deck-view to the South, showing PM10 samplers and PM2.5 samplers

| Site Name | San Diego-Overland Ave aka Kearny Mesa (KMA) | | | | |
|---|---|---|---|---|---|
| Particulate Samplers | **$PM_{10}$** GMWL 2000H w/SA1200 head | **Co-$PM_{10}$** GMWL 2000H w/SA1200 head | **$PM_{2.5}$** R&P Partisol-Plus 2025 | **Co-$PM_{2.5}$** R&P Partisol-Plus 2025 | |
| Monitor objective | Representative Concentration | Representative Concentration | Representative Concentration | Representative Concentration | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | |
| Analysis method | gravimetric SDAPCD lab | gravimetric SDAPCD lab | gravimetric SDAPCD lab | gravimetric SDAPCD lab | |
| Start date | 9-4-91 | | 9-3-99 | 9-3-99 | |
| Operation schedule | 1:6 | 1:6 | 1:3 | 1:12 | |

| | | | | | |
|---|---|---|---|---|---|
| Sampling season | Year-round | Year-round | Year-round | Year-round | |
| Inlet height above ground | 7 meters | 7 meters | 7.5 meters | 7.5 meters | |
| Inlet vertical distance from supporting structure | 1.5 meters | 1.5 meters | 2 meters | 2 meters | |
| Inlet horizontal distance from supporting structure | N/A | N/A | N/A | N/A | |
| Inlet distance from obstructions on roof | N/A | N/A | N/A | N/A | |
| Inlet distance from obstructions not on roof | N/A | N/A | N/A | N/A | |
| Inlet distance from trees | 25 meters / N | 23 meters / N | 22 meters / N | 26 meters / N | |
| Inlet distance to furnace or incinerator flue | N/A | N/A | N/A | N/A | |
| Inlet distance between collocated monitors | 2 meters | 2 meters | 4 meters | 4 meters | |
| Inlet unrestricted airflow | 360º | 360º | 360º | 360º | |
| Is it suitable for comparison against the annual PM2.5? | N/A | N/A | Yes | Yes | |

| Site Name | San Diego-Overland Ave aka Kearny Mesa (KMA) | | | | |
|---|---|---|---|---|---|
| Toxics/VOC Samplers | **Xontech 910/912** (PAMS) | **XonTech 910** | **XonTech 925** (PAMS) | | |
| Monitor objective | Representative Concentration | Representative Concentration | Representative Concentration | | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | | |
| Analysis method | GC-FID | GC-FID | HPLC | | |
| Start date | 1994 | | 7-2-95 | | |
| Operation schedule | 1:6 / 1:3 | 1:12 | 1:6 / 1:3 | | |
| Sampling season | Year-round PAMS Jul-Oct | Year-round | Year-round PAMS Jul-Oct | | |
| Inlet height above ground | 8.1 meters | 8.1 meters | 8.1 meters | | |
| Inlet vertical distance from supporting structure | 2.6 meters | 2.6 meters | 2.6 meters | | |
| Inlet horizontal distance from supporting structure | N/A | N/A | N/A | | |
| Inlet distance from obstructions on roof | N/A | N/A | N/A | | |
| Inlet distance from obstructions not on roof | N/A | N/A | N/A | | |

| | | | | | |
|---|---|---|---|---|---|
| Inlet distance from trees | 26 meters / N | 26 meters / N | 26 meters / N | | |
| Inlet distance to furnace or incinerator flue | N/A | N/A | N/A | | |
| Inlet distance between collocated monitors | .7 meters | .7 meters | N/A | | |
| Inlet unrestricted airflow | 360º | 360º | 360º | | |

| Site Name | San Diego-Overland Ave aka Kearny Mesa (KMA) | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind Speed** Qualimetrics | **Wind Direction** Qualimetrics | **InternalTemp** Qualimetrics | **External Temp** Rotronics | **Rel Humidity** Rotronics |
| Range | 0-50 mph | 0-540 deg | -50 to 50 deg C | -40 to 140 deg F | 0 to 100 % |
| Analysis method | Cup anemometer | Potentiometer | RTD | RTD | Capacitor sensor |
| Start date | 4-1-74 | 4-1-74 | | 1-15-75 | |
| Height above ground | 10 meters | 10 meters | N/A | 5.5 meters | 5.5 meters |
| Vertical distance from supporting structure | N/A | N/A | N/A | N/A | N/A |
| Horizontal distance from supporting structure | N/A | N/A | N/A | N/A | N/A |
| Distance from obstructions on roof | N/A | N/A | N/A | N/A | N/A |
| Distance from obstructions not on roof | N/A | N/A | N/A | N/A | N/A |

| Site Name | San Diego-Overland Ave aka Kearny Mesa (KMA) | | | | |
|---|---|---|---|---|---|
| Meteorological | **Pressure** | **Solar Radiation** Eppley | | | |
| Range | 712.5-787.4 mm Hg | 0-1400 w/m$^2$ | | | |
| Analysis method | Transducer | Differential thermopile | | | |
| Start date | | | | | |
| Height above ground | 3 meters | 4.9 meters | | | |
| Vertical distance from supporting structure | N/A | 1.1 meters | | | |
| Horizontal distance from supporting structure | N/A | N/A | | | |
| Distance from obstructions on roof | N/A | N/A | | | |
| Distance from obstructions not on roof | N/A | N/A | | | |

**Site Name: MIRAMAR**

The Miramar (MMR) site is located near Kearny Villa Road, just north of the Highway 52 overpass. This important meteorological site provides data for upper-air wind and temperature profiling (see Definition of Terms for RWP/RASS). It works in conjunction with the Point Loma site, furnishing data essential to forecasting and modeling, as part of the District's PAMS program.

The San Diego-Overland (Kearny Mesa) monitoring station will be displaced due to renovations at the County Operations Center by 2012. In 2010, the District started parallel sampling with an ozone monitor at the Miramar monitoring site, south-southwest near the location of the present Kearny Mesa monitoring site. Approximately, 0.7 miles from the Kearny Mesa site.

| | |
|---|---|
| Site Name | Miramar (MMR) – Enhanced Meteorological Data Collection Network |
| AQS ID | N/A |
| CARB number | N/A |
| SAROAD - Number | N/A |
| GIS coordinates | Latitude: 32° 50' 44" N Longitude: 117° 07' 26" W |
| Location | |
| Address | Kearny Villa Road |
| Dist. to road | 155 meters |
| Traffic count | N/A |
| Groundcover | gravel |
| Representative Area | N/A |
| Operational | 1999 |
| Sources | N/A |
| Landmarks | N/A |
| Elevation above sea level | 132 meters (432 ) |

| Site Name | Miramar (MMR) | | | | |
|---|---|---|---|---|---|
| Meteorological | **RWP/RASS** Radian LAP3000 | | | | |
| Range | Winds: 100-2500 m Temp: 100-1500 m | | | | |
| Analysis method | RASS | | | | |
| Start date | 1999 | | | | |
| Height above ground | Ground level | | | | |
| Vertical distance from supporting structure | N/A | | | | |
| Horizontal distance from supporting structure | N/A | | | | |
| Distance from obstructions on roof | N/A | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Distance from obstructions not on roof | N/A | | | | |
| Unrestricted airflow | 360º | | | | |

Miramar RWP/RASS

**Site Name: MOUNT SOLEDAD**

The Mount Soledad site is located off Via Capri on the grounds of the Scripps Institute of Oceanography research facility, where it sits on a bluff overlooking the Pacific Ocean. This small meteorological site currently provides meteorological data only for wind speed and wind direction, which helps fulfill daily forecasting requirements, and is valuable for ozone transport assessments. Information collected here also enriches the various modeling databases. This site has previously been used to contribute important $O_3$ and $NO_x$ data during past Southern California ozone studies.

The building that housed the District's Mount Soledad equipment was shut down by the Department of Health and safety, due to the discovery of asbestos. As a result of this health danger, the District has removed all equipment from this site. The owner, the University of California at San Diego (UCSD), of the location is scheduled to remove the asbestos in mid - late 2010. Due to budgetary issues, UCSD has no immediate plans to remodel the facility. As a result, the District has no plans to revisit the site for any future monitoring.

| | |
|---|---|
| Site Name | Mount Soledad (MTS) - Enhanced Meteorological Data Collection Network |
| AQS ID | NA |
| CARB number | 060731011 |
| SAROAD - Number | NA |
| GIS coordinates | Latitude: 32° 50' 26" N Longitude: 117° 14' 59" W |
| Location | Scripps Marine Physical Lab |
| Address | 7110 Via Capri, San Diego |
| Dist. to road | 40 meters |
| Traffic count | N/A |
| Groundcover | Dirt, gravel |
| Representative Area | N/A |
| Operational | 1989 |
| Sources | N/A |
| Landmarks | Pacific Ocean 1 mile NW |
| Elevation above sea level | 205 meters (673 ) |

| Site Name | Mount Soledad (MTS) | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind Speed*** Qualimetrics | **Wind Direction*** Qualimetrics | | | |
| Range | 0-50 mph | 0-540 deg | | | |
| Analysis method | Cup anemometer | Potentiometer | | | |
| Start date | 10-4-89 | 10-4-89 | | | |
| Height above ground | 10 meters | 10 meters | | | |
| Vertical distance from supporting structure | N/A | N/A | | | |
| Horizontal distance from supporting structure | N/A | N/A | | | |
| Distance from obstructions on roof | N/A | N/A | | | |

| | | | | | |
|---|---|---|---|---|---|
| Distance from obstructions not on roof | N/A | N/A | | | |
| Unrestricted airflow | 360º | 360º | | | |

*These sensors were disabled from July, 2003 through July, 2007.

Upslope View to Northwest

Downslope View to Northwest

**Site Name: OTAY MESA**

This site, which has been operational since February, 1990, is located in a Paseo International parking lot at the Otay Mesa Port of Entry. When this site was first established, the dual intent was to provide representative data from this portion of the county, as well as to capture data on northbound transport of air pollutants into the San Diego Air Basin from Baja California. A result of the North American Free Trade Agreement (NAFTA) of 1994 was the movement of commercial cargo traffic from the San Ysidro to the Otay Mesa border crossing. With more than 1.4 million truck crossings per year, the Otay Mesa Port of Entry is now the largest commercial crossing in the California/Mexico border and handles the second highest volume of trucks of all U.S./Mexico border crossings. Consequently, $NO_x$ concentrations are inordinately high, primarily from diesel emissions, resulting in reduced ozone concentrations from $NO_x$ scavenging. Similarly, the Otay Mesa site is the only site where the former annual $PM_{10}$ federal standard has been exceeded in San Diego County for non-exceptional event episodes.

One impact of this huge influx of traffic is that ambient data collected here are no longer "representative", with siting requirements no longer valid. The District plans to relocate this site sometime before the end of 2010. Parallel $PM_{10}$ sampling at the Donovan site since January, 2005, has adequately demonstrated that actual representative $PM_{10}$ measurements for this part of the county should indeed be much lower than the Otay site data suggest.

| | |
|---|---|
| Site Name | Otay Mesa (OTM) |
| AQS ID | 060732007 |
| CARB number | 80139 |
| SAROAD - Number | 056820007I01 |
| GIS coordinates | Latitude: 32° 33' 08" N Longitude: 116° 56' 16" W |
| Location | Parking lot next to International Border. |
| Address | 1100 B Paseo International, San Diego |
| Dist. to road | Paseo Int'l 24 meters E, SR 905 73 meters W |
| Traffic count | 40,000 veh/day (border crossing) |
| Groundcover | Paved asphalt |
| Representative Area | San Diego MSA |
| Operational | 02/01/90 |
| Sources | International Border truck crossing |
| Landmarks | Otay Mesa Border Crossing, Brown Field 4 km NW, Mt. Otay 4 km NE |
| Elevation above sea level | 160 meters (524 ) |

| Site Name | Otay Mesa (OTM) | | | | |
|---|---|---|---|---|---|
| Ambient air analyzers | **$O_3$** TECO 49 | **$NO_x$, $NO_2$** TECO 42 | **$SO_2$** TECO 43C | **CO** TECO 48i | |
| Monitor objective | Representative Concentration | Representative Concentration | Representative Concentration | Representative Concentration | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | Neighborhood Scale | |
| Sampling method | UV absorption | Chemiluminescence | Pulsed Fluorescence | Gas Filter Correlation | |
| Range full scale | 1 ppm | 1 ppm | 1 ppm | 50 ppm | |
| Start date | 2-28-90 | 2-28-90 | 3-1-90 | 1995 | |

| | | | | | |
|---|---|---|---|---|---|
| Sampling season | Year-round | Year-round | Year-round | Year-round | |
| Sample line | Teflon | Teflon | Teflon | Teflon | |

| Site Name | Otay Mesa (OTM) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample manifold inlet height above ground | Material | Residence time (Seconds) | Vertical distance from supporting structure | Distance from obstructions on roof / direction | Distance from obstructions not on roof / direction | Distance from trees / direction | Unrestricted airflow (degrees) | Distance to nearest road / direction |
| 4.7 meters | Glass | 2.8 | 2.7 meters | N/A | N/A | 17.4 m/ E | 360º | 23.9m / E 51.8m / N |

View to South from deck, with $PM_{10}$ and XonTech 924

View to North

| Site Name | Otay Mesa (OTM) | | | | |
|---|---|---|---|---|---|
| Particulate Samplers | **$PM_{10}$** GMWL 2000H w/SA1200 head | **Co-$PM_{10}$** GMWL 2000H w/SA1200 head | | | |
| Monitor objective | Representative Concentration | Representative Concentration | | | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | | | |
| Analysis method | Gravimetric SDAPCD lab | Gravimetric SDAPCD lab | | | |
| Start date | 7-16-90 | 9-3-91 | | | |
| Operation schedule | 1:6 | 1:6 | | | |
| Sampling season | Year-round | Year-round | | | |
| Inlet height above ground | 5.4 meters | 5.4 meters | | | |
| Inlet vertical distance from supporting structure | 1.5 meters | 1.5 meters | | | |
| Inlet horizontal distance from supporting structure | N/A | N/A | | | |
| Inlet distance from obstructions on roof | N/A | N/A | | | |
| Inlet distance from obstructions not on roof | N/A | N/A | | | |
| Inlet distance from trees | 17.6 meters | 20.1 meters | | | |
| Inlet distance to furnace or incinerator flue | N/A | N/A | | | |
| Inlet distance between collocated monitors | 5.2 meters | 5.2 meters | | | |
| Inlet unrestricted airflow | 360º | 360º | | | |
| Is it suitable for comparison against the annual PM2.5? | N/A | N/A | | | |

| Site Name | Otay Mesa (OTM) | | | | |
|---|---|---|---|---|---|
| Toxic Samplers | **Xontech 910A** | **XonTech 924** | | | |
| Monitor objective | Representative Concentration | Representative Concentration | | | |
| Spatial scale | Neighborhood Scale | Neighborhood Scale | | | |
| Analysis method | GC-MS | LC-ICP-MS | | | |
| Start date | Jan, 2007 | 1994 | | | |
| Operation schedule | 1:6 | 1:12 | | | |
| Sampling season | Year-round | Year-round | | | |
| Inlet height above ground | 8.4 meters | 5.9 meters | | | |
| Inlet vertical distance from supporting structure | 2 meters | 2 meters | | | |
| Inlet horizontal distance from supporting structure | N/A | N/A | | | |
| Inlet distance from obstructions on roof | N/A | N/A | | | |
| Inlet distance from obstructions not on roof | N/A | N/A | | | |
| Inlet distance from trees | 20.5 meters | 17.6 meters | | | |
| Inlet distance to furnace or incinerator flue | N/A | N/A | | | |
| Inlet distance between collocated monitors | N/A | N/A | | | |
| Inlet unrestricted airflow | 360º | 360º | | | |

| Site Name | Otay Mesa (OTM) | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind Speed** Qualimetrics | **Wind Direction** Qualimetrics | **InternalTemp** Qualimetrics | **External Temp** Qualimetrics | |
| Range | 0-50 mph | 0-540 deg | -50 to 50 deg C | -58 to 122 deg F | |
| Analysis method | Cup anemometer | Potentiometer | RTD | RTD | |
| Start date | 12-13-90 | 12-13-90 | | 1-4-91 | |
| Height above ground | 10 meters | 10 meters | 1.7 meters | 5.5 meters | |
| Vertical distance from supporting structure | N/A | N/A | N/A | N/A | |
| Horizontal distance from supporting structure | N/A | N/A | N/A | N/A | |
| Distance from obstructions on roof | N/A | N/A | N/A | N/A | |
| Distance from obstructions not on roof | N/A | N/A | N/A | N/A | |
| Unrestricted airflow | 360º | 360º | N/A | 360º | |

**Site Name: POINT LOMA**

Situated off Woodward Road in the Seaside area of NCCOSC (RDTE DIV), the radar profiler sits just off the Pacific Ocean. This important meteorological site provides data for upper-air wind and temperature profiling (see Definition of Terms for RWP/RASS). It works in conjunction with the Miramar site, furnishing data for forecasting and modeling as part of the District's PAMS program. The RWP/RASS unit at this site is nearing the end of its useful life, due to the harsh marine environment.

| | |
|---|---|
| Site Name | Point Loma (PTL) - Enhanced Meteorological Data Collection Network |
| AQS ID | N/A |
| CARB number | N/A |
| SAROAD - Number | N/A |
| GIS coordinates | Latitude: 32° 41' 49" N Longitude: 117° 15' 14" W |
| Location | Immediately west of bldg 599 |
| Address | Woodward Road |
| Dist. to road | 90 meters NE |
| Traffic count | N/A |
| Groundcover | Gravel |
| Representative Area | N/A |
| Operational | 9-12-95 |
| Sources | N/A |
| Landmarks | Pacific Ocean 10 meters NW |
| Elevation above sea level | 32 meters (104 ) |

| Site Name | Point Loma (PTL) - Enhanced Meteorological Data Collection Network | | | | |
|---|---|---|---|---|---|
| Meteorological | **RWP/RASS** Radian LAP3000 | | | | |
| Range | Winds: 100-2500 m Temp: 100-1500 m | | | | |
| Analysis method | RASS | | | | |
| Start date | 1996 | | | | |
| Height above ground | Ground level | | | | |
| Vertical distance from supporting structure | N/A | | | | |
| Horizontal distance from supporting structure | N/A | | | | |
| Distance from obstructions on roof | N/A | | | | |
| Distance from obstructions not on roof | N/A | | | | |
| Unrestricted airflow | 360º | | | | |

**Site Name: SAN MARCOS PEAK**

Situated in the Merriam Mountains northeast of San Marcos, off of Rancho Luiseno Road, lies the San Marcos Peak meteorological site. This station is nestled amongst avocado groves. It is currently supplying data solely for wind speed and direction. Data collected from this site is useful for characterizing ozone transport days.

| | |
|---|---|
| Site Name | San Marcos Peak (SMP) - Enhanced Meteorological Data Collection Network |
| AQS ID | 060731015 |
| CARB number | N/A |
| SAROAD - Number | N/A |
| GIS coordinates | Latitude: 33° 11' 06" N Longitude: 117° 07' 46" W |
| Location | Roof of American Tower building |
| Address | Rancho Luiseno Road |
| Dist. to road | N/A |
| Traffic count | N/A |
| Groundcover | gravel |
| Representative Area | N/A |
| Operational | |
| Sources | N/A |
| Landmarks | |
| Elevation above sea level | 475 meters (1557 ) |


| Site Name | | | | | |
|---|---|---|---|---|---|
| Meteorological | **Wind Speed** Qualimetrics | **Wind Direction** Qualimetrics | | | |
| Range | 0-50 mph | 0-540 deg | | | |
| Analysis method | Cup anemometer | Potentiometer | | | |
| Start date* | 1997 (1/1/07) | 1997 (1/1/07) | | | |
| Height above ground | | | | | |
| Vertical distance from supporting structure | meters | | | | |
| Horizontal distance from supporting structure | N/A | | | | |
| Distance from obstructions on roof | N/A | N/A | | | |
| Distance from obstructions not on roof | meters | | | | |
| Unrestricted airflow | 360º | 360º | | | |

*This site opened during the 1997 Southern California Ozone Study, but data have only been submitted to AQS since 2007.

# 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

## A Primer on the San Diego PAMS Network

Upon review and approval of the 2006 Ambient Air Monitoring Network Plan, the EPA suggested inclusion in forthcoming issuances of a short description of the San Diego PAMS network. This appendix is intended to satisfy that request, and to provide some historical perspective as well.

In accordance with the 1990 Clean Air Act Amendments (CAAA), EPA had required more extensive monitoring of ozone and its precursors in areas with persistently high ozone levels (mostly large metropolitan areas). At that time, San Diego was classified as a "severe non-attainment" area for ozone. It was not until late 1994 that EPA reclassified San Diego as being in the lesser "serious non-attainment" category. In 2001, when San Diego was declared as being in a state of "attainment" for the 1-hour NAAQS for ozone. Regardless, whether classified as extreme, severe or serious, all regions so classified were equally subject to the new requirements set forth in Section 182(c)(1) of the 1990 Clean Air Act Amendments, which required enhanced ozone monitoring. Further revisions to 40 CFR 58 in March, 1992, and promulgated on February 12, 1993, called for the establishment of Photochemical Assessment Monitoring Stations (PAMS). These PAMS sites were to collect and report detailed data for volatile organic compounds, nitrogen oxides, ozone and meteorological parameters to obtain more comprehensive and representative data on ozone air pollution.

The chief objective of the enhanced ozone monitoring revisions was to provide an air quality database that would assist air pollution control agencies in evaluating, tracking the progress of, and, if necessary, refining control strategies for attaining the ozone NAAQS. Ambient concentrations of ozone and ozone precursors were to be used to make attainment/nonattainment decisions, aid in tracking VOC and NOx emission inventory reductions, better characterize the nature and extent of the ozone problem, and prepare air quality trends. To best characterize the PAMS data to be collected, and to make the data most meaningful to future ozone modeling projects and development of State Implementation Plans, the CAAA called for each PAMS network to contain sites conforming to four categories:

- **Type I Site** - Upwind and background characterization site. These sites were established to characterize upwind background and transported ozone and its precursor concentrations entering the area and to identify those areas which were subjected to overwhelming incoming transport of ozone. Type I sites were to be located in the predominant morning upwind direction from the local area of maximum precursor emissions and at a distance sufficient to obtain urban scale measurements. Typically, these sites were located near the upwind edge of the photochemical grid model domain. The fourth and final PAMS site made operational by the District was the Camp Pendleton Type I monitoring site, established in 1997 and PAMS-ready that same year.

- **Type II Site** - Maximum ozone precursor emissions impact site. These sites were established to monitor the magnitude and type of precursor emissions in the area where maximum precursor emissions representative of the MSA were expected to impact and are suited for the monitoring of urban air toxic pollutants. Type II sites were to be located

immediately downwind (using the same morning wind direction as for locating Type I) of the area of maximum precursor emissions and were typically placed near the downwind boundary of the central business district or primary area of precursor emissions mix to obtain neighborhood scale measurements. These sites would also be receptors for emissions from major transportation corridors. Depending upon the size of the area, a second Type II site was sometimes required and was to be placed in the second-most predominant morning wind direction. The collocation of PAMS sites with existing NAMS/SLAMS sites dramatically reduced required costs for operation of the PAMS program. San Diego's initial PAMS Type II site was the El Cajon monitoring station, and enhanced VOC sampling began there in 1994. Similarly, a second Type II site was established at the Kearny Mesa monitoring station in 1994.

- **Type III Site** - Maximum ozone concentration site. These sites were intended to monitor maximum ozone concentrations occurring downwind from the area of maximum precursor emissions. Typically, these sites are located 10 to 30 miles from the main urban area. In early 1995, San Diego established a Type III site when it began PAMS monitoring at the Alpine monitoring station.

- **Type IV Site** - Extreme downwind monitoring site. These sites were established to characterize the extreme downwind transported ozone and its precursor concentrations exiting the area and would identify those areas which were potentially contributing to overwhelming ozone transport into other areas. Type IV sites were to be located in the predominant afternoon downwind direction from the local area of maximum precursor emissions. Typically, these sites were located near the downwind edge of the photochemical grid model domain. No Type IV site has been established in the SDAB.

Prior to promulgation of the PAMS regulations, California already had existing programs which studied ozone precursors in ozone non-attainment areas, and the existing database was quite substantial. Intensive studies aimed at photochemical grid model verification had generated vast quantities of precursor data. In addition to the volumes of data that had already been collected in California that was analogous to the PAMS data. California also had air quality standards for ozone significantly more stringent than the federal statutes. Thus, when PAMS was initially proposed, along with a rather severe sampling schedule for speciated hydrocarbons, California (i.e. the California Air Resources Board, acting in conjunction with the State's Primary Air Quality Organizations) came back with a suggested "Alternative Plan". Following a series of long negotiations, EPA accepted the California Alternative Plan. As outlined, San Diego's four recommended PAMS sites were approved. San Diego was also relieved of the responsibility to operate a Type IV PAMS site, in exchange for expanded carbonyl sampling and additional operation of two meteorological sites with upper air profilers (the Point Loma and Miramar sites). Data collection commenced at these sites in 1995, and 1999, respectively. These sites provide value-added upper-air wind and temperature data. All four original sites which comprised the San Diego PAMS Network continue to operate and collect enhanced ozone data.

# APPENDIX C

## The NCore Monitoring Plan

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# APPENDIX D

## The New Lead Standard: 2009

Background

When the National Ambient Air Quality Standards for lead, one of the six criteria pollutants, were first established in 1978, the best science of the day concluded that an averaged standard value of 1.5 $\mu g/m^3$ was sufficient to protect human health with an adequate margin of safety. However, over the past decade a number of scientific research studies looking into the interrelationship between lead ingestion and human physiological effects have revealed some startling new facts. A preponderance of evidence indicates that there is no safe threshold for blood lead levels in children. The ingestion of seemingly minute quantities of lead can be directly related to neurocognitive and neurobehavioral disruption. When the lead NAAQS came up for review in late 2004, it soon became apparent that the then-current standard would require substantial reduction. On October 15, 2008, the national lead standard was revised down to 0.15 $\mu g/m^3$, to become effective January 12, 2009.

Historic lead monitoring in San Diego

The District began collecting Total Suspended Particulate samples for lead analysis from a downtown San Diego site in 1971, shortly after the ARB had established the nation's first State standard for lead. At that time, the standard was set at 1.5 $\mu g/m^3$, the same value to be adopted by the EPA when it promulgated the initial Federal lead standards in 1978. This standard has remained unchanged for nearly forty years. The primary source (accounting for approximately 90%) of airborne lead particulates for the greater part of the United States has been gasoline-powered engine exhaust. Lead in many forms, but principally tetraethyl lead, has been blended with gasoline, primarily to boost octane levels, since the early 1920s. EPA began working to reduce lead emissions soon after its inception, issuing the first reduction standards in 1973, which called for a gradual phase down of lead to one tenth of a gram per gallon by 1986. Effective January 1, 1996, the 1990 Clean Air Act banned the sale of the small amount of leaded fuel that was still available in some parts of the country for use in on-road vehicles. (In contrast, the ARB has limited lead in gasoline since 1976.) The early years of lead sampling in San Diego averaged very near the State standard, with maximum values exceeding 5 $\mu g/m^3$. Similar high values were recorded from the two other TSP sites in Chula Vista and El Cajon which were added to the lead network*. Lead levels decreased dramatically with the leaded gasoline phase-out. Between 1996 and 2002, when routine monitoring had ended at San Diego's three collection sites, mean lead concentrations varied from approximately 0.01 - 0.03 $\mu g/m^3$. While these values are well below the new standard, a few maximum-value samples measured out at 0.15 - 0.22 $\mu g/m^3$. With a presumed half-life of around 100 years in the environment, lead once entrained in roadside soils will not dissipate completely for a long time. The major remaining US lead sources are leaded aviation gas used in piston-engine aircraft (45%), and various metals (23%) and manufacturing (14%) industries.

* With reference to the original lead standards, San Diego had not exceeded the Federal standard since 1980, nor the State standard since 1987.

The Future

The new lead standard requires monitoring in two categories:

- Source-oriented monitoring. This is required from Core Based Statistical Areas that have sources emitting greater than one ton/year lead. Source-directed monitoring must commence by January 1, 2010.
- Non- Source-oriented monitoring (i.e. population-oriented). This is required from Core Based Statistical Areas that have populations greater than 500,000. Non-source-oriented monitoring must commence by January 1, 2011.

San Diego will fall under the second category, and possibly the first category if the tons/year category is reduced by 50%, as has been proposed. As any single particulates-monitoring method requires at least one collocated sampler, the District will be required to operate at least two samplers by 2011. These samplers will likely be deployed at the El Cajon NCore site.

# APPENDIX E

## Acronyms and Definition of Terms

AQS: Air Quality System. Houses the national database and data management system, administered by the EPA, which houses the entirety of the ambient air pollution data collected by the nation's federal, state, local and tribal air pollution control agencies from thousands of monitoring statAQS also contains meteorological data, descriptive information about each monitoring station (including its geographic location and its operator), and data quality assurance/quality control information.

ARB: (California) Air Resources Board, the state agency empowered to carry out the dictates of the Clean Air Act. Within California, the Air Resources Board oversees all geographic areas except those covered by the three Primary Quality Assurance Organizations (PQAO).

ARMs: Approved Regional Methods are monitoring methods that continuously measure fine particulate matter of a size of 2.5 micrometers or less ($PM_{2.5}$), and produce data that meet specific criteria in comparison to the data from the FRM for $PM_{2.5}$ (which is not a continuous monitoring method).

Attainment: A geographic area that meets or does better than the primary standard is called an attainment area; areas that don't meet the primary standard are called nonattainment areas**.**

BAM: Beta Attenuation Monitor. A type of $PM_{2.5}$ monitor in which the quantity of fine particulates collected on a sample filter or tape is determined by the degree to which the particulates attenuate (block) a stream of beta particles issued from a radioactive source.

BAR: Barometric pressure. This parameter is currently monitored only at the San Diego – Overland site, and ambient pressures are then assigned to all other sites after being corrected for altitude.

CFR: Code of Federal Regulations. A compilation of all current federal regulations.

$CH_4$/NMHC: Methane/Non-Methane Hydrocarbons. A continuous measurement via gas chromatography of ozone precursors (NMHC) and the much more prevalent, though less reactive, methane ($CH_4$). On urban and regional scales, it is the non-methane hydrocarbons that dominate the chemistry of $O_3$ and $NO_x$.

CHO: Carbonyl compounds. An important group of reactive hydrocarbons including formaldehyde, acetaldehyde and acetone, which are ozone precursors and play a major role in photochemistry and ozone formation.

Chromium (VI): Read as "chrome six", or hexavalent chrome. Chromium is an essential trace element which exists in two different oxidative states. Chromium (III) is necessary for proper human nutrition, whereas chromium (VI) demonstrates mutagenic and carcinogenic effects at relatively low levels. It is primarily a fugitive emission from plating, flame/plasma spray, and painting operations.

CO: Carbon monoxide, a colorless, odorless and poisonous gas produced by the incomplete combustion of fuels. A major pollutant produced in large quantities by gasoline-powered vehicles. Except for one occasion during the October, 2003 firestorm, the San Diego Air Basin has not violated the state or federal CO standards since 1990.

Collocated: A collocated sampler is of the same type as the primary, and run on the same sampling days under identical conditions. It is sited within a specified distance from the primary sampler. Results are used to estimate precision of network particulate and PAMS data.

Cont $PM_{2.5}$: Any of various automated $PM_{2.5}$ samplers that collect continuous real-time data and generally report that data as one-hour averages.

Criteria Pollutant: Under provisions of the Clean Air Act, which is intended to improve the quality of the air we breathe, EPA sets limits on how much of a pollutant can be in the air anywhere in the United States. This ensures that all Americans have the same basic health and environmental protections. The law allows individual states to have stronger pollution controls, but states are not allowed to have weaker pollution controls than those set for the whole country. EPA calls these pollutants "criteria air pollutants" because the agency has regulated them by first developing health-based criteria (science-based guidelines) as the basis for setting permissible levels. One set of limits (primary standard) protects health; another set of limits (secondary standard) is intended to prevent environmental and property damage. The six criteria pollutants are $O_3$, $NO_2$, CO, $SO_2$, particulate matter ($PM_{10}$, $PM_{2.5}$), and lead.

FEM: Federal Equivalent Method. An instrument that employs a method other than the Federal Reference Method but meets the requirements for measuring a species specified in 40 CFR Part 53, subchapter B.

FRM: Federal Reference Method, An instrument that employs a method specified in 40 CFR Part 50.

HUM: Relative humidity. These measurements are used to help gauge the horizontal and vertical extent of the inversion layer, and how it varies throughout the day.

Inversion Layer: San Diego's temperature inversion is formed when warm, dry air overlies the cool, moist marine air. Hovering between 2,000 feet above sea level, this inversion prevents the free dispersal of pollutants into the air above the inversion layer, and causes ozone levels to increase below the inversion layer.

MSA: Metropolitan Statistical Area (see page 4)

NAAQS: National Ambient Air Quality Standards. A maximum concentration above which adverse effects on human health may occur.

NIST: National Institute of Science and Technology. A non-regulatory federal agency within the U.S. Commerce Department's Technology Administration, that provides primary reference materials for governmental, academic and industrial laboratories nationwide.

$NO_2$: Nitrogen Dioxide. A by-product of incomplete combustion that is intimately involved in photochemistry and ozone formation, as well as acid rain formation. The San Diego Air Basin has not exceeded the federal annual average $NO_2$ standard since 1978, nor the State one-hour standard since 1988.

$NO_x$: A measure of total Oxides of Nitrogen, consisting primarily of nitrogen dioxide ($NO_2$) and nitric oxide (NO).

$O_3$: Ozone. Historically the pollutant of primary concern within the San Diego Air Basin. This colorless gas results from complex chemical reactions between nitrogen dioxide and volatile organic compounds. It is the major component of smog.

PAMS: Photochemical Assessment Monitoring Stations. A generic, collective term for a group of 50 hydrocarbon compounds that are involved in photochemistry and ozone formation.

PQAO: Primary Quality Assurance Organization, formerly known as "reporting organization". Defined such that measurement uncertainty among all stations in the organization can be expected to be reasonably homogenous, as a result of common factors including operation by a common team of field operators according to a common set of procedures, common calibration facilities and standards, use of common standard operating procedures, oversight by a common quality assurance organization, and support by common management and laboratory. The California PQAOs are San Diego County APCD, South Coast AQMD, Bay Area AQMD, and California Air Resources Board.

$PM_{2.5}$: Particulate matter with an aerodynamic diameter of less than 2.5 microns. This size particulate is thought to be primarily responsible for harmful health effects. Because of their small size (about one-thirtieth the width of a human hair), these fine particles can lodge deeply into the lungs. The first $PM_{2.5}$ NAAQS was established in 1997. Sometimes referred to as "PM fine".

$PM_{2.5}$-carbon: Measurements of the elemental and organic carbon contributions (OC/EC) to a $PM_{2.5}$ sample. These values may be related to the quantity of hazardous diesel particulates present in ambient air. The District's SASS and $PM_{2.5\text{-carbon}}$ samplers are part of the national particulate Speciation Trends Network (STN).

$PM_{10}$: Particulate matter with an aerodynamic diameter of less than 10 microns. This was the first size cut-point established for particulate matter (1987) and was previously thought to be the size primarily responsible for adverse health effects.

$PM_{10\text{-}2.5}$: "Inhalable coarse particles", such as those found near roadways and dusty industries, have aerodynamic diameters larger than 2.5 micrometers and smaller than 10 micrometers. There is currently no standard for this size particulate.

RWP/RASS: Upper-air wind and temperature monitoring is critical to the determination of daily transport patterns and the capacity to disperse regional smog. Accurate and timely measurements of the vertical wind and temperature structure of the atmospheric boundary layer are essential to the meteorological and air quality modeling necessary for air quality management planning, as well as to meet ongoing air quality forecasting requirements. The radar wind profilers (RWP), with radio acoustic sounding systems (RASS) for vertical temperature profiles, collect hourly

data in near real-time, at favorable accuracy and cost compared to alternative techniques such as balloon-borne soundings or towers. RWP/RASS units are part of the District's PAMS program

San Diego Air Basin: The area defined by geographical and administrative boundaries used for air pollution control programs in San Diego County.

SASS: Spiral Aerosol Speciation Samplers. A type of $PM_{2.5}$ sampler that collects low-volume 24-hr samples as part of the national STN (see $PM_{2.5\text{-carbon}}$).

SIP: States are required to develop state implementation plans (SIPs) that explain how they will clean up polluted areas. EPA must approve each SIP, and if a SIP isn't acceptable, EPA can take over enforcing the Clean Air Act in that state. The District submits a SIP to EPA through ARB.

SLAMS: State and Local Air Monitoring Station

$SO_2$: Sulfur Dioxide. A by-product produced when sulfur-containing fossil fuels (coal, oil, etc.) are burned. It is one of two criteria pollutants associated with acid rain, and also contributes to visibility impairment in large parts of the country. The San Diego Air Basin has never violated State or federal $SO_2$ standards.

SRD: Solar Radiation. The total amount of incoming solar radiation reaching the surface. A portion (UV) of the solar spectrum is involved in photochemical formation of ozone.

STN: Speciation Trends Network. A network of sampling locations established by the EPA in 2001 to characterize $PM_{2.5}$ composition in urban areas. Roughly 300 sites nationwide are part of this network, two are in the San Diego Air Basin (El Cajon and Escondido).

THC: Total Hydrocarbons. A measure of all non-speciated gaseous hydrocarbons found in an ambient air sample, including carbonyl compounds, VOCs and ambient toxics compounds.

TMP: External Temperature.

TOX: Ambient Toxics. A collective term for the 48 compounds of interest which are either identified as human carcinogens, are classified as Hazardous Air Pollutants (HAPs) by EPA, or which pose other risks to human health.

Transport: The movement of air pollutants from one air basin to another.

VOC: Volatile Organic Compound. A term sometimes used interchangeably with PAMS, which refers to the reactive hydrocarbons involved with ozone formation.

WDR: Wind Direction Resultant. A vector average of wind direction.

WSR: Wind Speed Resultant. A vector average of wind speed.