2011

Ambient Air Quality Network Plan

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

PREPARED BY

The Monitoring & Technical Services Division

of the

San Diego Air Pollution Control District

June 30, 2012

Introduction

The U.S. Environmental Protection Agency (EPA) finalized amendments to the ambient air monitoring regulations. 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 new monitoring programs.

The regulations from Title 40, Part 58, Section 10(a) of the Code of Federal Regulations (40 CFR 58.10, (a)(1) state 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 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…"*

This document is prepared and submitted as partial of the fulfillment of these requirements. This assessment details the current monitoring network in the San Diego Air Basin (SDAB) for the criteria pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), Lead (Pb) and particulate matter (PM_{10} & $PM_{2.5}$). The monitoring sites are categorized by the following types: NCore (national core sites), SLAMS (state and local air monitoring sites), SPM (special purpose monitoring), and $PM_{2.5}$ speciation sites (STN,CSN, Supplemental) PAMS and Toxics sites. Specific site information includes location information, site type, objectives, spatial scale, sampling schedule, equipment used, sampling method used, and monitor objective.

Purposes, Scope, and Organization of Report

In San Diego County there are 11 locations where the ambient air quality was routinely measured for gaseous and particulate air pollutants in 2011. These sites are operated by the San Diego Air Pollution Control District (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 SDAB. The report meets requirements for an annual network plan as listed in Title 40 of the Code of Federal Regulations (CFR), Part 58.10. The 40 CFR 58.10 require that the report be submitted to the EPA by July 1, of each year.

As required by the CFR, 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 pollution levels (or concentrations) that the regulations allow to be compared to the ambient air quality standards for regulatory purposes. This report also includes information regarding $PM_{2.5}$ speciation monitoring.

This report will be available for a 30 day public inspection period from July 1– July 31 with comments to be submitted to the EPA. Hardcopies of this report are available for review at District headquarters. The current network plan, as well as past ones, are available o the District's website. comments submitted regarding the content of this report will be forwarded to EPA Region IX headquarters. Please submit any comments in writing prior to July 31, 2012, to David Shina, Senior Chemist, Ambient Air Quality Section, dshina@sdapcd.org, or mail/deliver to District headquarters, 10124 Old Grove Road, San Diego, CA, 92131.

Agency Contact Information

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:

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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

Additional Air Pollution Information

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

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.

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

The 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 II of the ARB annual network report contains listings of all the monitoring sites in the State, along with the years for which the data are available for each monitor and regional maps showing the locations of the monitoring sites. To review the data from this report, as well as other data in general, go to http://www.arb.ca.gov/aqd/netrpt/netrpt.htm. The 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.

Webpages summarizing the National Ambient Air Quality Standards and the California Ambient Air Quality Standards at the EPA's and ARB's websites, respectively, are also available.

Near real-time ambient data, as well as historical data is available on the District's website (http://www.sdapcd.org/). Other helpful websites to visit and they are: http://airnow.gov/, and at: http://www.epa.gov/ttn/airs/airsaqs/detaildata/downloadaqsdata.htm.

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Section 1.0.0 Overview of the Network Operation

The District operated 11 monitoring sites in 2011, which collected data on the criteria pollutants (Figure 1.1). One site collected additional meteorological data in addition to sampling for several pollutants and one site collected meteorological data only. These sites are used to assist with pollutant forecasting, data analysis and characterization of pollutant transport throughout the air basin (Figure 1.2). Additional sites were established for Lead sampling at two airports in the 4th quarter of 2011, but were not operational until early 2012. Table 1.1 of this section 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 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. 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 order of concern in the San Diego Air Basin are ozone , fine particulate matter 2.5 micrometers in diameter or less, particulate matter 10 micrometers in diameter or less, and a number of toxic compounds. Other pollutants measured include oxides of nitrogen, carbon monoxide, and sulfur dioxide. Monitoring for meteorological parameters are also conducted at most monitoring stations. Data for all of the pollutants are 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 they breathe.

Not all pollutants are monitored at all sites, but most sites monitor for multiple 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 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 downwind concentration trends of these pollutants.

Section 1.1.0 San Diego Air Basin

The SDAB covers roughly 4,200 sq. mi., lies in the southwest corner of California, and comprises all of San Diego County. The population and emissions are concentrated mainly in the western portion of the County. According to ARB sources, San Diego County accounts for about eight percent of the State's population and about 7 percent of the State's criteria pollutant emissions.

Section 1.2.0 Topography

The topography of San Diego County is highly varied, being comprised of flatlands and mesas, broad valleys, canyons, foothills, mountains, and deserts. Generally, building structures are on the flatlands, mesas, and valleys, while the canyons and hills tend to be sparsely developed. This segmentation is what has carved the region into a conglomeration of separate cities that led to low density housing and an automobile-centric environment.

The topography of San Diego County is unique and varied. Drive 100 miles in any direction and one will encounter a different topographical zone. To the west of San Diego are its beaches, to the south is Tijuana, Mexico and the Baja California Peninsula, to the near east are the mountains, to the far east is the desert (the Salton Sea Air Basin), and to the north is the South Coast Air Basin (the greater Los Angeles-San Bernardino area).

The topography also drives the pollutant levels. The SDAB is not classified as a contributor, but it is classified as a transport recipient. The transport pollutants are O_3, NOx and Volatile Organic Compounds (VOCs), that are transported from the South Coast Air Basin in the north and, when the wind shifts direction, Tijuana, Mexico, in the south.

Section 1.3.0 Climate

The climate of San Diego is classified as Mediterranean, but is incredibly diverse because of the topography. The climate is dominated by the Pacific High pressure system that results in mild, dry summers and mild, wet winters. San Diego experiences an average of 201 days above 70 °F and 9-13" of rainfall annually (mostly, November - March). El Niño patterns will have large affects on the annual rainfall received in San Diego.

An El Niño is a warming of the surface waters of the eastern Pacific Ocean. It is a climate pattern that occurs across the tropical Pacific Ocean that is associated with drastic weather occurrences, including enhanced rainfall in Southern California.

La Niña is a term for cooler than normal sea surface temperatures across the Easter Pacific Ocean. In general, San Diego receives less than normal rainfall during La Niña years. The Pacific High drives the prevailing winds in the SDAB. The winds tend to blow onshore in the daytime and offshore at night. In the summer, an inversion layer is created over the coastal areas and increases the O_3 levels. In the winter, San Diego often experiences a shallow inversion layer which tends to increase carbon monoxide and $PM_{2.5}$ concentration levels due to the increased use of residential wood burning.

In the fall months, the SDAB is often impacted by Santa Ana winds. These winds are the result of a high pressure system over the Nevada-Utah/California borders that overcome the westerly wind pattern and force hot, dry winds from the east to the Pacific Ocean. These winds are powerful and incessant. They blow the Air Basin's pollutants out to sea. However, a weak Santa Ana can transport air pollution from the South Coast Air Basin and greatly increase the San Diego O_3 concentrations. A strong Santa Ana also primes the vegetation for firestorm conditions.

Section 1.4.0 Population

The population of San Diego County has been increasing by about 1.5% per year. In 2011, the population of San Diego was estimated at 3.2 million people.

Section 1.5.0 History of the Design of the Network

Over the years, several studies have been performed by District personnel in locations throughout the SDAB to ascertain the viability of the network with regards to the gaseous criteria pollutants and particulate matter. The results of those studies and the decisions based on them are how the Network has evolved over the years to its current state of coverage. Also, some stations relocate within a community or city due to tenancy issues, such as redevelopment, etc.

The community of Alpine in the foothills to the east of San Diego traditionally records the highest ozone readings in the network due to its location downwind of the populated areas of the County and the topography. In 1989, the District performed an ozone study 20 miles east of the Alpine station, at a CALTRANS maintenance facility off Route 80 in the town of Descanso. The values recorded at the Descanso location were the same as recorded at the Alpine location, but with a 1 to 2 hour time lag, depending upon weather conditions. Since the values at the Descanso location would not add any substantial information to the network, the District discontinued the study.

The District also performed an ozone study in the community of Ramona. The city of Ramona is about 20 miles northwest of Alpine and 15 miles east-southeast of Escondido. It is also mid-elevation between the Escondido and Alpine locations. The values recorded in the Ramona study were essentially the average of the values between Alpine and Escondido. Since the values at the Ramona location could be interpolated between the Alpine and Escondido monitors, the Ramona location was discontinued and no further action was taken

Studies were done to see if the District needed to increase monitoring within the network. Studies were performed in Chollas Heights (5 miles northeast of the Downtown location & 10 miles southwest of the El Cajon location) and the northern area of downtown San Diego (2.5 miles north of the current Downtown station location). Both showed equivalent numbers to the Downtown San Diego (south) monitor, so the studies were discontinued and no further monitoring was performed.

Lastly, a study was performed to determine if the District needed to expand the network along the southwest quadrant of the SDAB. An ozone monitor was placed in the community of Imperial Beach, about 15 miles southwest of the old Downtown San Diego monitor. The numbers collected there directly coincided with the values collected at the old Downtown San Diego monitor location, so the study was discontinued and no further monitoring was performed

In 1998, the ARB entered in a partnership with the local air pollution districts in placing $PM_{2.5}$ monitors throughout the state. Several factors were accounted for, such as temperature, humidity, precipitation, wind speeds, and elevation. The EPA Region IX approved the ARB's statewide plan for the placement of $PM_{2.5}$ monitors within each district and the location of the collocated monitors for each district to satisfy the Quality Assurance requirements of the Code of Federal Regulations (CFR.)

Section 1.6.0 Sampling Locations

This section will give a brief description of the locations of our air pollution monitoring sites.

Section 1.6.1 Alpine (ALP)

Alpine is an unincorporated community in the eastern foothills, elevation approximately 1,800 ft, of San Diego County with a population of about 14,000 people and covers an area of approximately 27 square miles.

Section 1.6.2 Camp Pendleton (CMP or CPD)

Camp Pendleton is a military base in the coastal northern region of San Diego County with a population of about 15,000 people and covers an area of about 200 square miles.

Section 1.6.3 Chula Vista (CVA)

Chula Vista is the second largest city in San Diego County. It spans from the Pacific coast into the east County and is located midway between downtown San Diego and the United States-Mexico border crossing. It has a population of about 250,000 people and covers an area of about 50 square miles.

Section 1.6.4 Del Mar (DMR)

Del Mar is a city in the mid-north coastal region of San Diego County located about midway between Camp Pendleton and San Diego-Beardsley. It has a population of about 4,000 people and covers an area of about 2 square miles.

Section 1.6.5 El Cajon (ECA)

El Cajon is a city in the eastern region of San Diego County located almost midway between all the middle county locations: Alpine, San Diego-Overland, San Diego-Beardsley, and Chula Vista. It has a population of about 100,000 people and covers an area of about 14 square miles.

Section 1.6.6 Escondido (ESC)

Escondido is a city located in the north-eastern region of the populated portion of the County. It is located about 21 miles between Camp Pendleton and El Cajon. It has a population of about 140,000 people and covers an area of about 37 square miles.

Section 1.6.7 Otay Mesa (OTM)

Otay Mesa is a community located in the farthest south region of San Diego County. It has a population of about 26,000 people and covers an area about 14 square miles.

Section 1.6.8 Donovan (DVN)

Donovan is located on the R. J. Donovan State Prison grounds in the middle part of the Otay Mesa area.

Section 1.6.9 San Diego - Beardsley (DTN)

The Beardsley location is located just south of downtown San Diego. It is located in the mid-coastal region of the County. It has a population of about 11,000 people. This area has been designated as an Environmental Justice area.

Section 1.6.10 San Diego - Overland (KMA)

The community of Kearny Mesa is located up and crosswind of the San Diego business district. Together with the surrounding communities, this area has one of the largest population bases in the County.

1.6.11 San Diego – Kearny Villa Road (KVR)

This is also in the community of Kearny Mesa and it is located up and cross wind of the San Diego business district. Together with the surrounding communities, this area has one of the largest population bases in the County.

Section 1.7.0 Enhance Meteorology Locations

This section will give a brief description of the locations of our air pollution enhanced meteorology sites (see Figure 1.2).

1.7.1 Kearny Villa Road

When this location housed only a wind profiler, it was originally called Miramar (MMR). In 2011, when the District relocated the Overland station alongside the wind profiler, it was formally redesignated by the ARB as KVR. Both are located on the southeast section of Miramar Marine Corp Air Station (MCAS). The base covers about 36 square miles.

1.7.2 San Marcos Peak (SMP)

This site is located northwest of the Escondido air pollution sampling station in the hills of the adjacent community of San Marcos.

Figure 1.1 San Diego APCD Air Quality Monitoring Network, 2011

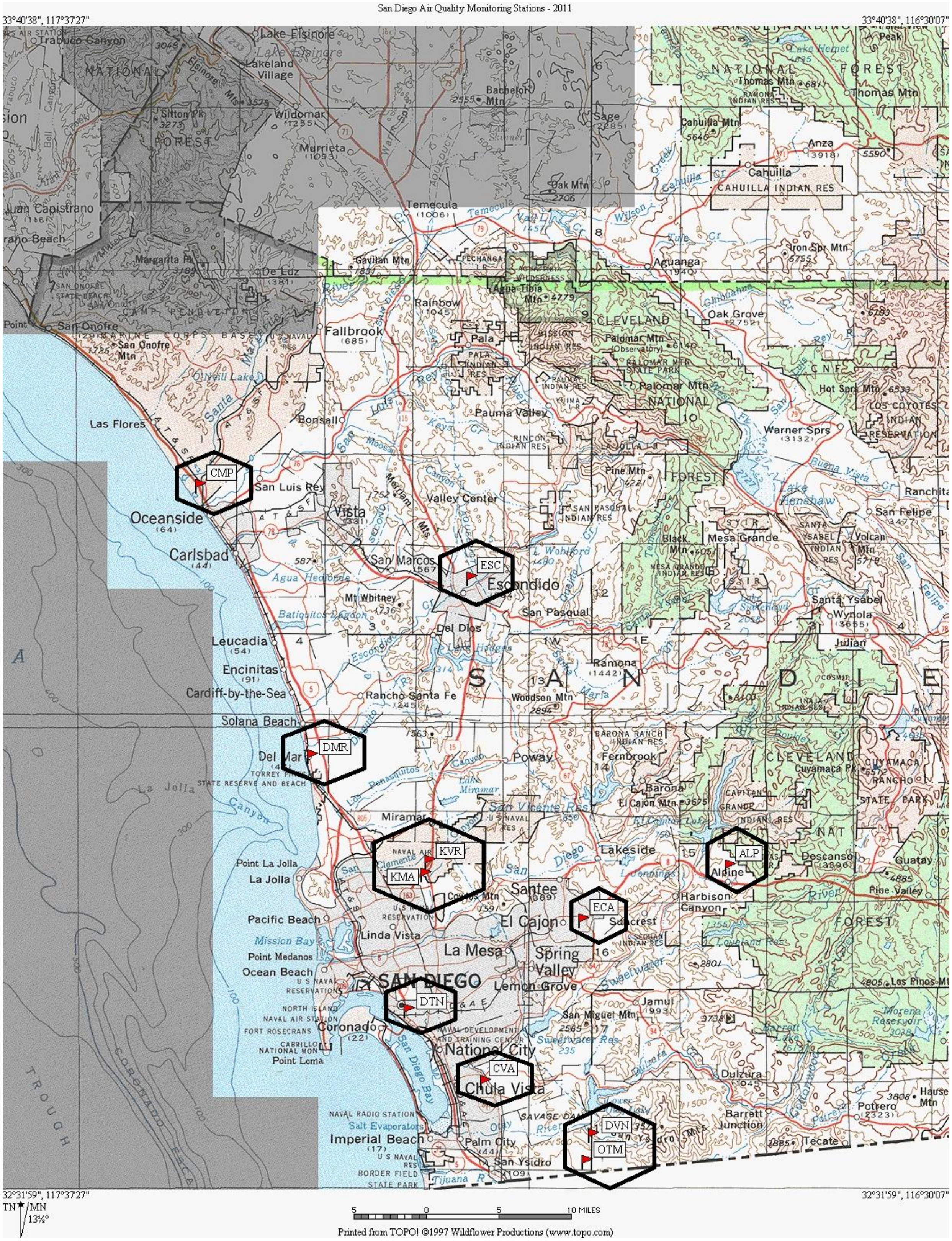


Figure 1.2 San Diego APCD Enhanced Meteorology Network, 2011

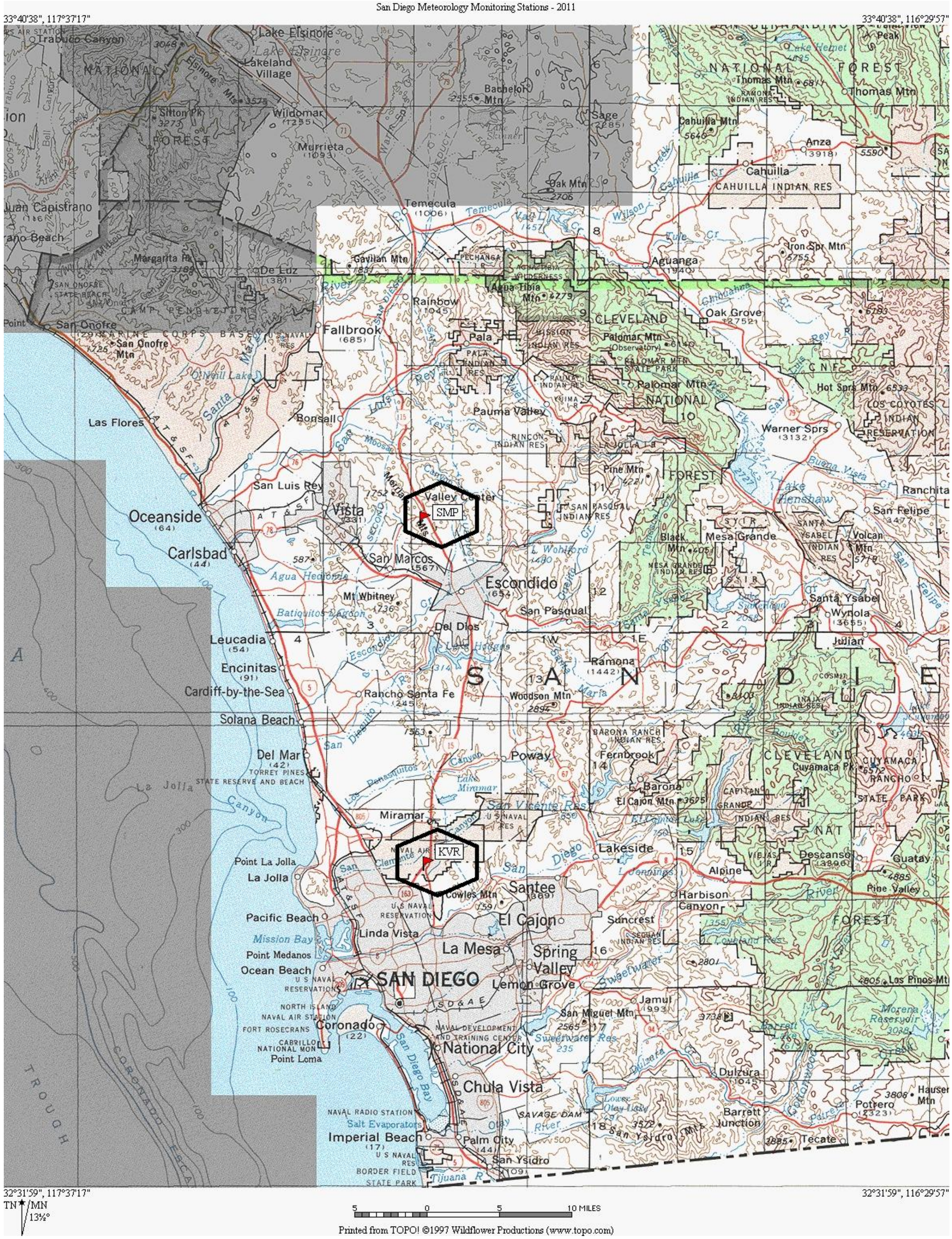


Table 1.1 Air monitoring sites with samplers, sampling frequency[1] - 2011

Parameter	Type	ALP Alpine	CMP Camp Pendleton	CVA Chula Vista	DMR Del Mar	DVN Donovan	ECA El Cajon	ESC Escondido	OTM Otay Mesa	DTN Downtown	KMA Overland	KVR Kearny Villa Rd	CRQ Palomar Airport	SEE Gillespie Field	SMP San Marcos	Instrument
O_3	(ambient) (continuous)	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24		APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24				Thermo 49
CO	(ambient) (continuous)							APCD 7 / 24		APCD 7 / 24						Thermo 48i
NO_2	(ambient) (continuous)	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24			APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24					Thermo 42 or 42C, or API 200E
SO_2	(ambient) (continuous)			APCD[14] 7 / 24					APCD[14] 7 / 24	APCD[14] 7 / 24						Thermo 43A or 43C
CO -T.L.E.	(NCore) (continuous)						APCD 7 / 24									Thermo 48i TLE
SO_2 -T.L.E.	(NCore) (continuous)						APCD 7 / 24									Thermo 43i TLE
NOy	(NCore) (continuous)						APCD 7 / 24									Thermo 42i NOy
Pb	(NCore) (Hi-Vol, TSP)						APCD 1:6, 24hrs									Tisch TE-5170BLVFC+
	(Airports) (Hi-Vol, TSP)												APCD 1:6, 24hrs	**APCD[12] 1:6, 24hrs**		Tisch TE-5170BLVFC+
PM_{10}	(NCore) (Lo-Vol)						APCD 1:6, 24hrs									Thermo 2025
	(Ambinet) (Hi-Vol)			APCD 1:6, 24hrs		APCD 1:6, 24hrs	APCD[15] 1:6, 24hrs	APCD 1:6, 24hrs	**APCD[2] 1:6, 24hrs**	APCD 1:6, 24hrs	**APCD[2] 1:6, 24hrs**					Graseby Metal Works 2000H
$PM_{2.5}$	(FEM) (continuous)		APCD[9] 7 / 24				APCD[10] 7 / 24	**APCD[3] 7 / 24**		APCD[11] 7 / 24						Met One FEM BAM 1020
	(non-FEM) (continuous)	STI/CARB[13] 7 / 24	APCD[9] 7 / 24				APCD[10] 7 / 24			APCD[11] 7 / 24						Met One BAM 1020
	(FRM) (sequential)			APCD 1:3, 24hrs			APCD 1:3, 24hrs	APCD 1:3, 24hrs		APCD 1:1, 24hrs	**APCD[4] 1:3, 24hrs**					Thermo 2025
PAMS	(VOCs)[5]	APCD 1:6, 24hrs	**APCD[7] 1:6, 24hrs**				APCD 1:6, 24hrs				**APCD[16] 1:6, 24hrs**					Xontech 910/912
	(Carbonyls)[5]						APCD[6] 1:6, 24hrs				APCD[6] 1:6, 24hrs					Xontech 925
TOXICS	(VOCs)			CARB 1:12, 24hrs			CARB 1:12, 24hrs	APCD 1:6, 24hrs	APCD 1:6, 24hrs	APCD 1:6, 24hrs						Xontech FSL 910A (APCD) Xontech 910 (CARB)[8]
	Total Metals			CARB 1:12, 24hrs			CARB 1:12, 24hrs		APCD 1:12, 24hrs	APCD 1:12, 24hrs						Xontech 924
	Cr(VI)			CARB 1:12, 24hrs			CARB 1:12, 24hrs									Xontech 924
	Aldehydes			CARB 1:12, 24hrs			CARB 1:12, 24hrs									Xontech 924
CSN	$PM_{2.5}$ Carbon-Speciated (sequential)						EPA 1:3, 24hrs	CARB 1:6, 24hrs								University Reseach Glassware 3000N
STN	Metals (simultaneous)						EPA 1:3, 24hrs	CARB 1:6, 24hrs								Met One SASS or SuperSASS
	Inorganic-Ions (simultaneous)						EPA 1:3, 24hrs	CARB 1:6, 24hrs								Met One SASS or SuperSASS
	Wood Smoke (simultaneous)							CARB 1:6, 24hrs								Met One SASS or SuperSASS
CSM (SDAPCD)	$PM_{2.5}$ Carbon-Speciated (simultaneous)						APCD 1:6, 24hrs	APCD 1:6, 24hrs		APCD 1:6, 24hrs						Met One SASS or SuperSASS
Meteorology	internal temperature	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24		APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24				Qualimterics
	external temperature	APCD 7 / 24	APCD 7 / 24	†APCD 7 / 24			APCD 7 / 24	APCD 7 / 24	†APCD 7 / 24	APCD 7 / 24	APCD 7 / 24					†Qualimterics or Rotronics
	% relative humidity	APCD 7 / 24					APCD 7 / 24				APCD 7 / 24					Rotronics
	wind speed/ wind direction	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24		APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24	APCD 7 / 24				APCD 7 / 24	Qualimterics
	barometric pressure										APCD 7 / 24					Qualimterics
	solar radiation										APCD 7 / 24					Eppley
	radar wind profiler (radio acoustic sounding system)											APCD 7 / 24				Radian LAP3000

Footnotes on the next page

- **Bold** & Yellowed areas indicate a collocation of samplers to satisfy Federal requirements.
- All sample times are set to Pacific Standard Time.
- The District operates, calibrates, and audits all instruments listed in Table 1.1, except for the Xontech 924's at the Chula Vista and El Cajon stations (operation only). Not all collected samples are analyzed by District personnel. Some samples are sent to the EPA or ARB laboratories for analysis and are noted in Table 1.1.

[1] Sampling frequencies are designated as follows:

7 / 24= gaseous criteria pollutant that samples continually with no media changes needed (7 days a week / 24 hours a day).

1:1= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs daily for a duration of 24 hours. The media are manually loaded, collected, and programmed to run on a weekly basis.

1:3= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs every three (3) days for a duration of 24 hours. The media are manually loaded, collected, and programmed in between sample days.

1:6= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs every six (6) days for a duration of 24 hours. The media are manually loaded, collected, and programmed on a weekly basis

1:12= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs every twelve (12) days for a duration of 24 hours. The media are manually loaded, collected, and programmed on a biweekly basis

[2] There is a collocated sampler of the same make and model and it runs on the same sampling frequency using the same Reference Method. The KMA location satisfies the requirements for PM_{10} collocation based on our Design Value. Due to their proximity to the border crossing, the OTM PM_{10} samplers no longer collect representative concentrations of the local air mass, and are not factored into Design Value calculations.

[3] There is a collocated sampler of the same make and model at this location. The collocated sampler runs on the same sampling frequency (7 / 24) using the same Reference Method.

[4] There is a collocated sampler of the same make and model at this location. The collocated sampler runs on a different sampling frequency of 1:12. The KMA location satisfies the requirements for $PM_{2.5}$ collocation based on our Design Value.

[5] These samplers collect year round on a 1:6 sampling schedule. During the non-PAMS season (November to the end of June), the samples have a 24-hour sampling duration. During the PAMS season (July to the end of October), as well as collecting a 24-hour sample (Carbonyls only), the samplers collect four samples that have a 3-hour sampling duration. The 3-hour samples are collected on a set time schedule and it is as follows:

start time 0200 – 0500 end time
start time 0500 – 0800 end time
start time 1200 – 1500 end time
start time 1600 – 1900 end time

[6] The duplicate sample is collected on the same sampler as the non-collocated sample, but it is run on a different channel. It is called a duplicate.

[7] On June 30, 2011, all PAMS-VOC collection was decommissioned at the Overland location. The collocated sampler was relocated to Camp Pendleton on July 1, 2011. It is of the same make and model as the main sampler and it runs on the same sampling Frequency and uses the same Reference Method.

[8] The SDAPCD uses a Xontech 910A that is Fused Silica lined (FSL). The ARB uses a Xontech 910.

[9] The BAM 1020 at the Camp Pendleton station was replaced with a FEM BAM 1020 on 11/9/11.

[10] The BAM 1020 at the El Cajon station was replaced with a FEM BAM 1020 on 3/4/11.

[11] The BAM 1020 at the San Diego-Beardsley station was replaced with a FEM BAM 1020 on 11/9/11.

[12] There is a collocated sampler of the same make and model at this location. The collocated sampler runs on the same sampling frequency (1:6) and same Reference Method.

[13] The continuous non-FEM sampler is operated by District personnel, but owned by Sonoma Technology, Inc., as part of the ARB's Children's Health Study. For information on the Children's Health Study refer to http://www.arb.ca.gov/research/chs/chs.htm.

[14] All the ambient level SO_2 monitors were decommissioned on June 30, 2011.

[15] The PM_{10} (Hi-Vol) sampler was decommissioned on June 30, 2011.

[16] PAMS-VOC sampling for both the main and collocated samplers were decommissioned on June 30, 2011. Commencement of the new collocation location at Camp Pendleton was July 1, 2011.

Section 1.8.0 Recent and Planned Changes to the Network

Table 1.2 is a matrix of the changes for the Network from 2011-2014.

Table 1.2 Summary of Recent and Planned Changes to the Network

	ALP	CMP	CVA	DMR	DVN	ECA	ESC	OTM	DTN	KMA	KVR	CRQ	SEE	SMP	Unknown1
	Alpine	Camp Pendleton	Chula Vista	Del Mar	Donovan	El Cajon	Escondido	Otay Mesa	Downtown	Overland	Kearny Villa Rd	Palomar Airport	Gillespie Field	San Marcos Peak	NO_2 Roadway1
Site Closures or Site Start-ups	Relocation due to tenancy issues-2013/2014	None	None	Possible closure 2012/2013	Parallel sampling for OTM relocation-2013	Relocation due to tenancy issues-2013/2014	None	Relocation due to source impact issues-2013/2014	None	Closed due to tenancy issues-1st Qtr 2012; Relocated to KVR	Official Site-1st Qtr 2012	Added-4th Qtr 2011;Official sampling-1st Qtr 2012	Added-4th Qtr 2011;Official sampling-1st Qtr 2012	None	Add-2013/2014
O_3	Range Change from 0-1000 ppb to 0-500 ppb-2013; New monitor-2013	Range Change from 0-1000 ppb to 0-500 ppb-2013; New monitor-2013	Range Change from 0-1000 ppb to 0-500 ppb-2013; New monitor-2013	Range Change from 0-1000 ppb to 0-500 ppb-2013	Parallel sampling for OTM relocation-2013	Range Change from 0-1000 ppb to 0-500 ppb in 2013	Range Change from 0-1000 ppb to 0-500 ppb-2013; New monitor-2013	Range Change from 0-1000 ppb to 0-500 ppb in 2013	Range Change from 0-1000 ppb to 0-500 ppb in 2013		Range Change from 0-1000 ppb to 0-500 ppb in 2013				
NO_2	New monitor-2012; Range Change from 0-1000 ppb to 0-500 ppb-2013/2014	New monitor-2012; Range Change from 0-1000 ppb to 0-500 ppb-2013/2014	New monitor-2012; Range Change from 0-1000 ppb to 0-500 ppb-2013/2014		Parallel sampling for OTM relocation-2013	New monitor-2012; Range Change from 0-1000 ppb to 0-500 ppb-2013/2014	New monitor-2012; Range Change from 0-1000 ppb to 0-500 ppb-2013/2014	New monitor-2012; Range Change from 0-1000 ppb to 0-500 ppb-2013/2014	New monitor-2012; Range Change from 0-1000 ppb to 0-500 ppb-2013/2014		New monitor-2012; Range Change from 0-1000 ppb to 0-500 ppb-2013/2014				Add to Network-2013/2014
CO							None		None						Add-2013/2014
SO_2			Stopped-2nd Qtr 2011					Stopped-2nd Qtr 2011	Stopped-2nd Qtr 2011						
CO -T.L.E.						None									
SO_2 -T.L.E.						None									
NOy						None									
Pb						Added-4th Qtr 2011						Added-4th Qtr 2011	Added-4th Qtr 2011		
PM_{10}	None	None	None			Stopped-2nd Qtr 2011	None	Stopped-2nd Qtr 2012	None		None				
$PM_{2.5}$ FRM			None			None	None		None		None				
$PM_{2.5}$ non-FEM	None														
$PM_{2.5}$ FEM		Switch to FEM-3rd Qtr 2011			Add-2013/2014	Switch to FEM-1st Qtr 2011	None		Switch to FEM-1st Qtr 2011						
$PM_{2.5}$ STN						None	None								
$PM_{2.5}$ CSN						None	None								
$PM_{2.5}$ CSM						None	None		None						
PAMS-VOCs	None	Added Collocation-3rd Qtr 2011				None				Stopped-2nd Qtr 2011; Collocated Relocated to CMP					
PAMS-Carbonyls						None	Designate a PAMS II site; Add-2013/2014			Stopped, due to catastrophic failure-3rd Qtr 2011	No relocation from KMA, due to catastrophic failure-3rd Qtr 2011				
TOXICS-VOCs					Parallel sampling for OTM relocation-2013		None	None	None						
TOXICS-Carbonyls					Add-2013/2014				Add-2012/2013						
TOXICS-Metals					Parallel sampling for OTM relocation-2013			None	None						
TOXICS-Cr (VI)								Add-2013/2014	Add-2013/2014						
internal temperature	None	None	None	None	Add-2013/2014	None	None	None	None		None				Add-2013/2014
external temperature	None	None	None		Add-2013/2014	None	None	None	None		None				Add-2013/2014
% relative humidity	None				Add-2013/2014	None	None	None	None		None				
wind speed/ wind direction	None	None	None	None	Add-2013/2014	None	None	None	None		None			None	Add-2013/2014
barometric pressure						Add-2013/2014					None				
solar radiation						Add-2013/2014					None				
radar wind profiler											None				

Red= Termination Orange= Relocation Green= Addition

Section 2.0.0 Purposes Served by the Monitors

Data from a network of air quality monitors serve many purposes. The data are useful to health researchers, the general public, regulatory agency staff at the Local, State, and Federal level, health agencies for protection of the public, environmentalists, business interests, and others. Air quality samples are generally collected for one or more of the following purposes:

- To determine compliance with and/or progress made towards meeting ambient air quality standards.
- To activate emergency control procedures that prevent or alleviate 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 (www.sdapcd.org) and air quality forecast recordings, and on radio and television.
- To provide a database for research for land-use, 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 for both designation and objective. 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.

The purpose for a monitor is based on several criteria, e.g. pollutant monitored, area served, objectives, etc. Tables 2.2-2.5 encapsulate all air pollution monitors and programs in the District with the previously mentioned accompanying criteria.

Note: 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. Table 2.1 lists the monitoring objectives and associated spatial scales.

Table 2.1 MONITORING PURPOSES DEFINITIONS

Monitoring Objective	*Appropriate Spatial Scale*
Highest concentration	Micro, Middle, Neighborhood
Population oriented	Neighborhood or Urban
Source impact	Micro, Middle, Neighborhood
General/Background levels	Urban or Regional
Regional transport	Urban or Regional
Welfare-related impacts	Urban or Regional

Section 2.1.0 Monitor Designation Definitions

CSM
Community Scale Monitoring by the SDAPCD for carbon analysis and the District's Toxics program.

CSN
Monitors that are part of the *Chemical Speciation Network*.

NCore
National Core station which measures low levels of CO, SO_2, NO_y (total oxides of nitrogen) and $PM_{2.5}$, PMcoarse, $PM_{2.5}$ speciation, and in conjunction with a PAMS location.

PAMS
Photochemical Assessment Monitoring Station where O_3, NO_2, meteorological data, PAMS-VOCs and/or PAMS-Carbonyls are measured.

QA
Monitors used for *Quality Assurance* purposes/collocation.

SLAMS
State and Local Air Monitoring Station which measures ambient concentrations of those pollutants for which standards have been established in 40 CFR Part 50.

SPM
Special Purpose Monitor is an instrument that is used for research purposes.

STN
Monitors that are part of the *Speciation Trends Network.*

Section 2.2.0 Sampling or Analysis Method Definitions

CL
Chemiluminescence Method is based upon the emission of photons in the reaction between ozone and nitric oxide (NO) to form nitrogen dioxide and oxygen.

CT
Low volume, continuous sampler, size selective inlet Method is based upon a regulated low flow (16.7 LPM) instrument that operates 7 / 24.

FL
Fluorescence-Method is based upon the principle that SO_2 molecules absorb ultraviolet (UV) light and become excited at one wavelength, then decay to a lower energy state emitting UV light at a different wavelength. The intensity of fluorescence is proportional to the SO2 concentration.

IR
Nondispersive infrared-Method is based upon the absorption of infrared radiation by CO in a non-dispersive photometer. Infrared energy from a source is passed through a cell containing the gas sample to be analyzed, and the quantitative absorption of energy by CO in the sample cell is measured by a suitable detector.

SI
High volume, manual, size selective-Method is based upon a regulated high flow (40 cfm) instrument that operates on a set schedule.

SP
Low volume, speciated-Method is based upon a regulated low flow (6.7 LPM) instrument that operates on a set schedule.

SQ
Low volume, sequential, size selective inlet-Method is based upon a regulated low flow (16.67 LPM) instrument that operates on a set schedule.

UV
Ultraviolet Absorption-Method is based upon the absorption of UV light by the ozone molecule and subsequent use of photometry to measure reduction of light at 254 nm, as expressed by the Beer-Lambert Law.

Section 2.3.0 Spatial Scale Definitions

MI
Microscale is an expanse of uniform pollutant concentrations, ranging from several meters up to 100m.

MS
Middle Scale is an expanse of uniform pollutant concentrations, ranging from about 100 meters to 0.5 kilometers.

NS
Neighborhood Scale is an expanse with dimensions, ranging in the 0.5 kilometer to 4.0 kilometer range.

US
Urban Scale is Citywide pollutant conditions with dimensions ranging from 4 to 50 kilometers.

Section 2.4.1 Monitoring Objective (Federal) Definitions

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

HC
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.

IM
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.

RC
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.

Section 2.4.2 Monitoring Objective (Local) Definitions

BURN

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. This includes 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.

TRENDS

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

TR

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.

WF

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

State Implementation Plan Maintenance (SIPM) Requirement is part of a comprehensive 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.

Section 2.5.0 Network Monitoring Purpose

Tables 2.2-2.5 breakdown the network by pollutant and/or monitoring program with respect to the site/location. Each table lists the monitor designation, sampling method, spatial scale, monitoring objectives, type of equipment, analyzing agency, and sampling frequency.

Table 2.2 NETWORK MONITORING PURPOSES (Gaseous Criteria Pollutants)

	Abbreviation	ALP	CMP	CVA	DMR	ECA[1]		ESC	OTM	DTN	KMA	KVR
	Name	Alpine	Camp Pendleton	Chula Vista	Del Mar	El Cajon		Escondido	Otay Mesa-Border Xing	San Diego-Beardsley	San Diego-Overland	Kearny Villa Rd.
	Address	2495A W. Victoria Dr.	21441 W. B St.	80 E. J St.	225 9th St.	1155 Redwood Ave.		600 E. Valley Pkwy	1100B Paseo International	1110A Beardsley St.	5555 Overland Ave.	Kearny Villa Rd.
	Latitude Longitude	32° 50' 32" N 116° 46' 06" W	33° 13' 01" N 117° 23' 46" W	32° 37' 52" N 117° 03' 33" W	32° 57' 08" N 117° 15' 51" W	32° 47' 28" N 116° 56' 32" W		33° 07' 40" N 117° 04' 31" W	32° 33' 08" N 116° 56' 16" W	32° 42' 05" N 117° 08' 59" W	32° 50' 11" N 117° 07' 43" W	32° 50' 43" N 117° 07' 26" W
	AQS ID	06 073 1006	06 073 1008	06 073 0001	06 073 1001	06 073 0003		06 073 1002	06 073 2007	06 073 1010	06 073 0006	06 073 1016
O_3	Monitor Designation	PAMS, SLAMS	PAMS, SLAMS	SLAMS	SLAMS	PAMS, SLAMS, NCore		SLAMS	SLAMS	SLAMS	PAMS, SLAMS	SPM
	Sampling Method	UV	UV	UV	UV	UV		UV	UV	UV	UV	UV
	Spatial Scale	US	NS	NS	NS	NS		NS	MI	NS	NS	NS
	Monitoring Objective (Federal)	HC	BL	RC	BL	RC		RC	IM	RC	RC	RC
	Monitoring Objective (Local)	Burn, Trends	Trends		Trends	Burn		Burn	Trends	SIPM	SIPM	
	Equipment Manufacturer/Model	Thermo 49	Thermo 49	Thermo 49	Thermo 49	Thermo 49		Thermo 49	Thermo 49	Thermo 49	Thermo 49	Thermo 49
CO	Monitor Designation					NCore		SLAMS		SLAMS		
	Sampling Method					IR		IR		IR		
	Spatial Scale					NS		NS		NS		
	Monitoring Objective (Federal)					RC		RC		RC		
	Monitoring Objective (Local)									SIPM		
	Equipment Manufacturer Model					Thermo 48i-TLE		Thermo 48i		Thermo 48i		
NO_2	Monitor Designation	PAMS, SLAMS	PAMS, SLAMS	SLAMS		PAMS, SLAMS	NCore	SLAMS	SLAMS	SLAMS	PAMS, SLAMS	
	Sampling Method	CL	CL	CL		CL	CL	CL	CL	CL	CL	
	Spatial Scale	US	NS	NS		NS	NS	NS	MI	NS	NS	
	Monitoring Objective (Federal)	RC	BL	RC		RC	RC	RC	IM	RC	RC	
	Monitoring Objective (Local)								Trends			
	Equipment Manufacturer/Model	Thermo 42C	Thermo 42	Thermo 42		Thermo 42C	Thermo 42i-NOy	Thermo 42	Thermo 42	Thermo 42	Thermo 42	
SO_2	Monitor Designation			SLAMS		NCore			SLAMS	SLAMS		
	Sampling Method			FL		FL			FL	FL		
	Spatial Scale			NS		NS			NS	NS		
	Monitoring Objective (Federal)			RC		RC			RC	RC		
	Monitoring Objective (Local)			Trends					Trends			
	Equipment Manufacturer/Model			Thermo 43A		Thermo 43i-TLE			Thermo 43C	Thermo 43A		

GLOSSARY OF TERMS

Monitor Designation

PAMS	Photochemical Assessment Monitoring
SLAMS	State and Local Air Monitoring Stations
SPM	Special Purpose Monitoring
NCore	National Core
QA	Quality Assurance collocated
CSN	Supplemental Speciation-Chemical Speciation Network
STN	Supplemental Speciation-Speciation Trends Network
CSM	Community Scale Monitoring (SDAPCD)
CA TAC	California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

CL	Chemiluminescence
CT	Low volume, continuous sampler, size selective inlet
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
IPMS	Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale

MI	Micro Scale
MS	Middle 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] The El Cajon station has instruments for the NCore program SO_2-TLE, CO-TLE, NO_y

All monitors operate on a continuous (7 / 24) basis.

Table 2.3 NETWORK MONITORING PURPOSES (Particulate Pollutants)

	Abbreviation	ALP	CMP	CVA	ECA			ESC			OTM	DVN	DTN		KMA	CRQ	SEE
	Name	Alpine	Camp Pendleton	Chula Vista	El Cajon			Escondido			Otay Mesa-Border Xing	Otay Mesa-Donovan	San Diego-Beardsley		San Diego-Overland	McClellan-Palomar Airport	Gillespie Field
	Address	2495A W. Victoria Dr.	21441 W. B St.	80 E. J St.	1155 Redwood Ave.			600 E. Valley Pkwy			1100B Paseo International	Donovan State Prision Rd.	1110A Beardsley St.		5555 Overland Ave.	2192 Palomar Airport Rd.	1960 Joe Crosson Dr.
	Latitude Longitude	32° 50' 32" N 116° 46' 06" W	33° 13' 01" N 117° 23' 46" W	32° 37' 52" N 117° 03' 33" W	32° 47' 28" N 116° 56' 32" W			33° 07' 40" N 117° 04' 31" W			32° 33' 08" N 116° 56' 16" W	32° 34' 46" N 116° 55' 46" W	32° 42' 05" N 117° 08' 59" W		32° 50' 11" N 117° 07' 43" W	33° 07' 43" N 117° 16' 18" W	32° 49' 30" N 116° 57' 45" W
	AQS ID	06 073 1006	06 073 1008	06 073 0001	06 073 0003			06 073 1002			06 073 2007	06 073 1014	06 073 1010		06 073 0006	06 073 1020	06 073 1021
PM_{10}	Monitor Designation			SLAMS	SLAMS	SLAMS, NCore		SLAMS			**SLAMS**	SLAMS	SLAMS		**SLAMS**		
PM_{10}	Sampling Method			SI	SI	SQ		SI			**SI**	SI	SI		**SI**		
PM_{10}	Spatial Scale			NS	NS	NS		NS			**MI**	NS	NS		**NS**		
PM_{10}	Monitoring Objective (Federal)			RC	HC	HC		RC			**IM**	RC	RC		**RC**		
PM_{10}	Monitoring Objective (Local)																
PM_{10}	Analysis By			SDAPCD	SDAPCD	SDAPCD		SDAPCD			**SDAPCD**	SDAPCD	SDAPCD		**SDAPCD**		
PM_{10}	Sampling Frequency			1:6	1:6	1:3		1:6			**1:6**	1:6	1:6		**1:6**		
PM_{10}	Equipment Manufacturer/Model			GMW 2000H w/ SA 1200 head	GMW 2000H w/ SA 1200 head	Thermo 2025		GMW 2000H w/ SA 1200 head			**GMW 2000H w/ SA 1200 head**	GMW 2000H w/ SA 1200 head	GMW 2000H w/ SA 1200 head		**GMW 2000H w/ SA 1200 head**		
Pb-TSP	Monitor Designation				SLAMS, NCore											SLAMS	**SLAMS**
Pb-TSP	Sampling Method				IPMS											IPMS	**IPMS**
Pb-TSP	Spatial Scale				NS											MI	**MI**
Pb-TSP	Monitoring Objective (Federal)				RC											IM	**IM**
Pb-TSP	Monitoring Objective (Local)																
Pb-TSP	Analysis By				SDAPCD											SDAPCD	**SDAPCD**
Pb-TSP	Sampling Frequency				1:6											1:6	**1:6**
Pb-TSP	Equipment Manufacturer/Model				Tisch TE-5170BLVFC+											Tisch TE-5170BLVFC+	**Tisch TE-5170BLVFC+**
$PM_{2.5}$ (non-speciated)	Monitor Designation	SPM	SLAMS	SLAMS	SLAMS, NCore	SLAMS, NCore		**SLAMS**	SLAMS				SLAMS	SLAMS	**SLAMS**		
$PM_{2.5}$ (non-speciated)	Primary Designation		Yes	Yes		Yes			Yes					Yes	**Yes**		
$PM_{2.5}$ (non-speciated)	Sampling Method	CT	CT	SQ	CT	SQ		**CT**	SQ				CT	SQ	**SQ**		
$PM_{2.5}$ (non-speciated)	Spatial Scale	US	NS	NS	NS	NS		**NS**	NS				NS	NS	**NS**		
$PM_{2.5}$ (non-speciated)	Monitoring Objective (Federal)	RC	BL	RC	RC	RC		**RC**	RC				RC	RC	**RC**		
$PM_{2.5}$ (non-speciated)	Monitoring Objective (Local)	Burn															
$PM_{2.5}$ (non-speciated)	Analysis By	Sonoma Tech Inc. for USC	SDAPCD	SDAPCD	SDAPCD	SDAPCD		**SDAPCD**	SDAPCD				SDAPCD	SDAPCD	**SDAPCD**		
$PM_{2.5}$ (non-speciated)	Sampling Frequency	7 / 24	7 / 24	1:3	7 / 24	1:3		**7 / 24**	1:3				7 / 24	1:1	**1:3**		
$PM_{2.5}$ (non-speciated)	Equipment Manufacturer/Model	Met One BAM	Met One FEM BAM[2]	Thermo 2025	Met One FEM BAM[3]	Thermo 2025		**Met One FEM BAM**	Thermo 2025				Met One FEM BAM[4]	Thermo 2025	**Thermo 2025**		
$PM_{2.5}$ (speciated)	Monitor Designation				CSN, NCore	STN, NCore	CSM Carbon-speciated	CSN	STN	CSM Carbon-speciated			CSM				
$PM_{2.5}$ (speciated)	Sampling Method				SP	SP	SP	SP	SP	SP			SP				
$PM_{2.5}$ (speciated)	Spatial Scale				NS	NS	NS	NS	NS	NS			NS				
$PM_{2.5}$ (speciated)	Monitoring Objective (Federal)				RC	RC	RC	RC	RC	RC			RC				
$PM_{2.5}$ (speciated)	Monitoring Objective (Local)																
$PM_{2.5}$ (speciated)	Analysis By				EPA	EPA	SDAPCD	CARB	CARB	SDAPCD			SDAPCD				
$PM_{2.5}$ (speciated)	Sampling Frequency				1:3	1:3	1:6	1:6	1:6	1:6			1:6				
$PM_{2.5}$ (speciated)	Equipment Manufacturer/Model				URG-3000N	Met One SASS	Met One SASS	URG-3000N	Met One SuperSASS	Met One SASS			Met One SASS				

GLOSSARY OF TERMS

Monitor Designation
- PAMS Photochemical Assessment Monitoring
- SLAMS State and Local Air Monitoring Stations
- SPM Special Purpose Monitoring
- NCore National Core
- QA Quality Assurance collocated
- CSN Supplemental Speciation-Chemical Speciation Network
- STN Supplemental Speciation-Speciation Trends Network
- CSM Community Scale Monitoring (SDAPCD)
- CA TAC California Toxics Air Contaminant Monitoring

Sampling or Analysis Method
- CL Chemiluminescence
- CT Low volume, continuous sampler, size selective inlet
- 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
- MI Micro Scale
- MS Middle 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
- TREND Trends analysis
- SIPM State Implementation Plan (SIP) Maintenance requirement

[1] The El Cajon station have a set of paired PM_{10} & $PM_{2.5}$ (lo-vol) samplers to calculate PMcoarse

Bold & Yellowed areas indicate a collocation of samplers to satisfy Federal QA requirements.

[2] The BAM 1020 at the Camp Pendleton station was replaced with a FEM BAM 1020 on 11/9/11.

[3] The BAM 1020 at the El Cajon station was replaced with a FEM BAM 1020 on 3/4/11.

[4] The BAM 1020 at the San Diego-Beardsley station was replaced with a FEM BAM 1020 on 11/9/11

Table 2.4 NETWORK MONITORING PURPOSES (PAMS Program)

Abbreviation		ALP	CMP	ECA		KMA
Name		Alpine	Camp Pendleton	El Cajon		San Diego-Overland
Address		2300 W. Victoria Dr.	21441 W. B St.	1155 Redwood Ave.		5555 Overland Ave.
Latitude Longitude		32° 50' 32" N 116° 46' 06" W	33° 13' 01" N 117° 23' 46" W	32° 47' 28" N 116° 56' 32" W		32° 50' 11" N 117° 07' 43" W
AIRS ID		06 073 1006	06 073 1008	06 073 0003		06 073 0006
PAMS	Monitor Designation	PAMS	**PAMS**	PAMS	PAMS	PAMS
	Sampling Method	Canister	**Canister**	Canister	Cartridges	Cartridges
	Spatial Scale	US	**NS**	NS	NS	NS
	Monitoring Objective	PAMS Type III	**PAMS Type I**	PAMS Type II	PAMS Type II	PAMS Type II
	Monitoring Objective	Trends	**Trends**	Trends	Trends	Trends
	Analysis By	SDAPCD	**SDAPCD**	SDAPCD	SDAPCD	SDAPCD
	Sampling Frequency	1:6*	**1:6***	1:6*	1:6*	1:6*
	Equipment Manufacture	Xonteck 910/912	**Xonteck 910/912**	Xonteck 910/912	Xonteck 925	Xonteck 925

GLOSSARY OF TERMS

Monitor Designation

PAMS	Photochemical Assessment Monitoring
SLAMS	State and Local Air Monitoring Stations
SPM	Special Purpose Monitoring
NCore	National Core
QA	Quality Assurance collocated
CSN	Chemical Speciation Network
STN	Speciation Trends Network
CSM	Community Scale Monitoring (SDAPCD)
CA TAC	California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

Canister	Evacuated Stainless Steel canister
Cartridges	Di-nitrophenylhydrazine cartridges

Spatial Scale

MI	Micro Scale
MS	Middle Scale
NS	Neighborhood Scale
US	Urban Scale

Monitoring Objective (federal)

PAMS Type I	Transported ozone, upwind of Type II site
PAMS Type II	Maximum ozone precoursor site, downwind of buisness district
PAMS Type III	Maximum ozone concentration site

Monitoring Objective (local)

BURN	Support residential/agricultural/prescribed BURN decisions
TRENDS	Trends analysis
SIPM	State Implementation Plan (SIP) Maintenance requirement

Bold & Yellowed areas indicate a collocation of samplers to satisfy QA requirements.

Table 2.5 NETWORK MONITORING PURPOSES (Toxics Program)

	Abbreviation	CVA				ECA				ESC	OTM		DTN	
	Name	Chula Vista				El Cajon				Escondido	Otay Mesa-Border Xing		San Diego-Beardsley	
	Address	80 E. J St.				1155 Redwood Ave.				600 E. Valley	1100B Paseo International		1110A Beardsley St.	
	Latitude	32° 37' 52" N				32° 47' 28" N				33° 07' 40" N	32° 33' 08" N		32° 42' 05" N	
	Longitude	117° 03' 33" W				116° 56' 32" W				117° 04' 31" W	116° 56' 16" W		117° 08' 59" W	
	AIRS ID	06 073 0001				06 073 0003				06 073 1002	06 073 2007		06 073 1010	
TOXICS	Pollutant	Toxics-VOCs	Toxics-Metals	Toxics-Cr (VI)	Toxics-Aldehydes	Toxics-VOCs	Toxics-Metals	Toxics-Cr (VI)	Toxics-Aldehydes	Toxics-VOCs	Toxics-VOCs	Toxics-Metals	Toxics-VOCs	Toxics-Metals
	Monitor Designation	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CSM VOCs	CSM VOCs	CSM Metals	CSM VOCs	CSM Metals
	Sampling Method	Canister	Filter	Filter	Cartridges	Canister	Filter	Filter	Cartridges	Canister-FSL	Canister-FSL	Filter	Canister-FSL	Filter
	Spatial Scale	NS	NS	NS	NS	NS	NS	NS	NS	NS	MI	MI	NS	NS
	Monitoring Objective (federal)	RC	RC	RC	RC	RC	RC	RC	RC	RC	IM	IM	RC	RC
	Monitoring Objective (local)	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends
	Analysis By	ARB	ARB	ARB	ARB	ARB	ARB	ARB	ARB	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD
	Sampling Frequency	1:12	1:12	1:12	1:12	1:12	1:12	1:12	1:12	1:6	1:6	1:12	1:6	1:12
	Equipment Manufacturer/Model	Xontech 910/912	Xontech 924	Xontech 924	Xontech 924	Xontech 910/912	Xontech 924	Xontech 924	Xontech 924	XonTech 910A Fused Silica Lined	XonTech 910A Fused Silica Lined	Xontech 924	XonTech 910A Fused Silica Lined	Xontech 924

GLOSSARY OF TERMS

Monitor Designation

- PAMS Photochemical Assessment Monitoring
- SLAMS State and Local Air Monitroing Stations
- SPM Special Purpose Monitoring
- NCore National Core
- QA Quality Assurance collocated
- CSN Chemical Speciation Network
- STN Speciation Trends Network
- CSM Community Scale Monitoring (SDAPCD)
- CA TAC California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

- Canister Evacuated stainless steel canister
- Canister-FSL Evacuated stainless steel canister-Fused silica lined
- Cartridges Di-Nitrophenylhydrazine cartridges
- Filter Quartz filters

Spatial Scale

- MI Micro Scale
- MS Middle 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

Section 3.0.0 Minimum Monitoring Requirements

The 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.

For pollutants monitoring, the minimum requirements for the number of monitors are in the 40 CFR 58, Appendix D "Network Design Criteria for Ambient Air Quality Monitoring". Each pollutant has different requirements for determining the minimum number of monitors needed for a Metropolitan Statistical Area (MSA). The MSA is based upon the total population within the District. Some Districts are comprised of multiple air basins. The County of San Diego encompasses one air basin, as outlined by the California Air Resources Board. Also, some pollutants have additional monitoring requirements associated with it, e.g. $PM_{2.5}$ monitoring has requirements for continuous and sequential monitors. Each section in this report that discusses the criteria pollutants lists the current Network Design Criteria for Ambient Air Quality Monitoring. For other pollutants or monitoring programs, PAMS, NCore, STN, CSN, etc., the minimum monitoring requirement is based on the criteria pollutant needs of the air basin.

For all criteria pollutants, sufficient monitoring exists in San Diego County. When the number of monitors required is based on the MSA population, it is taken from the latest U.S. Census. In the non-Census years, the MSA population is extrapolated by the San Diego Association of Governments (SANDAG).

Section 3.1.0 Minimum Network Requirements

Tables 3.2a & b summarize the minimum number of monitors, sites, programs, and QA collocation needs for the SDAB.

Table 3.1a Summary of Monitor Requirements

	Pollutant or Program	Minimum Number of Monitors Required	Number of Active Monitors	Number of Monitors Needed
Ambient	O_3	2	9	None
	NO_2	0	7	None
	CO	0	2	None
	SO_2	0	0	None
	Pb	0	0	None
	$PM_{2.5}$ FRM	1	5	None
	$PM_{2.5}$ FEM	1	5	None
	$PM_{2.5}$ STN	0	2	None
	$PM_{2.5}$ CSN	0	2	None
	PM_{10}	2 - 4	6	None
NCore	NOy	1	1	None
	CO TLE	1	1	None
	SO_2 TLE	1	1	None
	$PM_{2.5}$ FRM	1	1	None
	$PM_{2.5}$ FEM	1	1	None
	PMcoarse	1	1	None
	STN	1	1	None
	CSN	1	1	None
	Pb	1	1	None
	Wind Speed/ Wind Direction/ External Temperature/ %Relative Humidity	1	1	None

Table 3.1b Summary of Site Requirements

	Pollutant or Program	Minimum Number of Sites Required	Number of Active Sites	Number of Monitors Needed
Airports	Pb	2	2	None
PAMS	Type II-VOCs	1	1	None
	Type II -Carbonyls	1	2	None
	NOx	2	2	None
	NOy	1	1	None
	CO	1	1	None
	O_3	4	4	None
	Surface Meteorology	4	4	None
	Upper Air Meteorology	1	1	None
Collocation	$PM_{2.5}$ FRM	1	1	None
	$PM_{2.5}$ FEM	1	1	None
	$PM_{2.5}$ FEM & FRM	1	3	None
	$PM_{2.5}$ CSN & STN	2	2	None
	Pb Airports	1	1	None

Section 3.2.0. State and Federal Standards for the Year

The limits set by the EPA are a minimum that all states must meet, National Ambient Monitoring Stations (NAMS) and State and Local Air Monitoring Stations (SLAMS), but each state is permitted to set stricter standards. The governing board for air pollution regulations in the state of California is the California Air Resources Board. The ARB has set stricter air standards and as such, all Counties, with few exceptions, are bound to adhere to these intrastate regulations. Table 3.1 lists the State and Federal regulations side by side for the criteria pollutants only (the non-criteria pollutants and accompanying footnotes, numbers10 & 12 were omitted).

Table 3.1 State and Federal Standards for the Criteria Pollutants for the Year

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 μg/m^3)		0.075 ppm (147 μg/m^3)		
Respirable Particulate Matter (PM10)	24 Hour	50 μg/m^3	Gravimetric or Beta Attenuation	150 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 μg/m^3		—		
Fine Particulate Matter (PM2.5)	24 Hour	—	—	35 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 μg/m^3	Gravimetric or Beta Attenuation	15 μg/m^3		
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[8]	1 Hour	0.18 ppm (339 μg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 μg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 μg/m3)		53 ppb (100 μg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[9]	1 Hour	0.25 ppm (655 μg/m^3)	Ultraviolet Fluorescence	75 ppb (196 μg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 μg/m^3)	
	24 Hour	0.04 ppm (105 μg/m^3)		0.14 ppm (for certain areas)[9]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[9]	—	
Lead[10,11]	30 Day Average	1.5 μg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 μg/m^3 (for certain areas)[11]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 μg/m^3		

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles) are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.

8. To attain the 1-hr national standard, the 3-yr average of the annual 98^{th} percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.

9. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99^{th} percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one

year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

11. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

Section 4.0.0 Ozone (O_3) Introduction

For 2011, Ambient level ozone (O_3) was sampled on a continuous basis at ten locations throughout the SDAB (Figure 4.1 and Table 4.2) and referenced to the Standards of the year (Table 4.1). The sampling equipment are listed in Tables 4.2 & 4.3.

Figure 4.1 Ozone Network Map

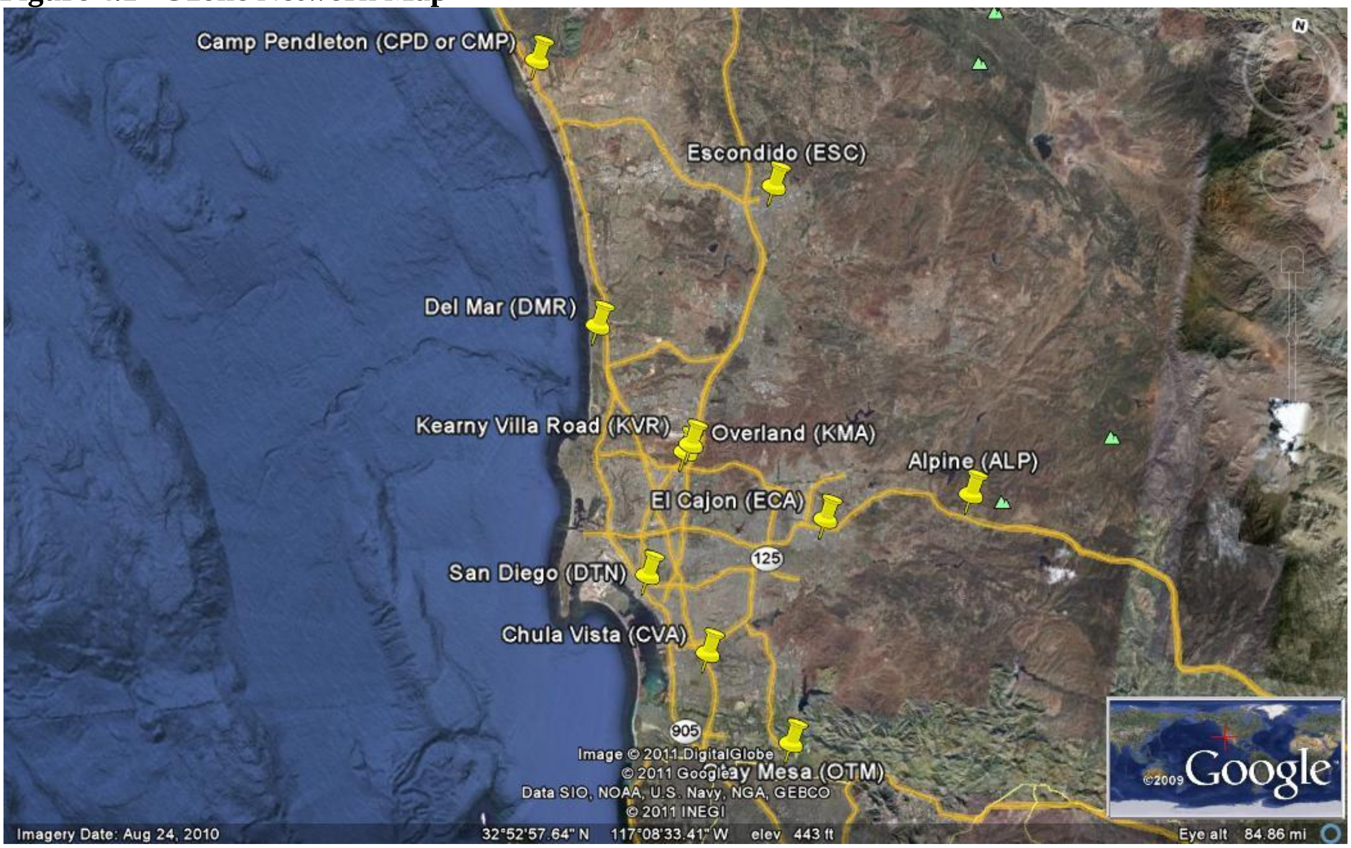


Table 4.1 Ozone State and Federal Standards for the Year

Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 μg/m^3)		0.075 ppm (147 μg/m^3)		

Table 4.2 Ozone Sampling Network

	Abbreviation	ALP	CMP	CVA	DMR	ECA	ESC	OTM	DTN	KMA	KVR
	Name	Alpine	Camp Pendleton	Chula Vista	Del Mar	El Cajon	Escondido	Otay Mesa-Border Xing	San Diego-Beardsley	San Diego-Overland	Kearny Villa Road
	Address	2495A W. Victoria Dr.	21441 W. B St.	80 E. J St.	225 9th St.	1155 Redwood Ave.	600 E. Valley Pkwy	1100B Paseo International	1110A Beardsley St.	5555 Overland Ave.	6125a Kearny Villa Rd
	Latitude	32° 50' 32" N	33° 13' 01" N	32° 37' 52" N	32° 57' 08" N	32° 47' 28" N	33° 07' 40" N	32° 33' 08" N	32° 42' 05" N	32° 50' 11" N	32° 50' 43" N
	Longitude	116° 46' 06" W	117° 23' 46" W	117° 03' 33" W	117° 15' 51" W	116° 56' 32" W	117° 04' 31" W	116° 56' 16" W	117° 08' 59" W	117° 07' 43" W	117° 07' 26" W
	AQS ID	06 073 1006	06 073 1008	06 073 0001	06 073 1001	06 073 0003	06 073 1002	06 073 2007	06 073 1010	06 073 0006	06 073 1016
O_3 (ambient)	Monitor Designation	PAMS, SLAMS	PAMS, SLAMS	SLAMS	SLAMS	PAMS, SLAMS, NCore	SLAMS	SLAMS	SLAMS	PAMS, SLAMS	SPM
	Sampling Method	UV	UV	UV	UV	UV	UV	UV	UV	UV	UV
	Spatial Scale	US	NS	NS	NS	NS	NS	MI	NS	NS	NS
	Monitoring Objective (Federal)	HC	BL	RC	BL	RC	RC	IM	RC	RC	RC
	Monitoring Objective (Local)	Burn, Trends	Trends		Trends	Burn	Burn	Trends	SIPM	SIPM	
	Analysis By	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD
	Sampling Frequency	7 / 24	7 / 24	7 / 24	7 / 24	7 / 24	7 / 24	7 / 24	7 / 24	7 / 24	7 / 24
	Equipment Manufacturer/Model	Thermo 49	Thermo 49	Thermo 49	Thermo 49	Thermo 49	Thermo 49	Thermo 49	Thermo 49	Thermo 49	Thermo 49

GLOSSARY OF TERMS

Monitor Designation
- PAMS Photochemical Assessment Monitoring
- SLAMS State and Local Air Monitoring Stations
- SPM Special Purpose Monitoring
- NCore National Core
- QA Quality Assurance collocated
- CSN Chemical Speciation Network
- STN Speciation Trends Network
- CSM Community Scale Monitoring (SDAPCD)
- CA TAC California Toxics Air Contaminant Monitoring

Sampling or Analysis Method
- CL Chemiluminescence
- CT Low volume, continuous sampler, size selective inlet
- 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
- IPMS Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale
- MI Micro Scale
- MS Middle 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

Section 4.1.0 Ozone – Sampling Frequency

Requirements for the sampling frequency of SLAMS monitors for pollutants are in the July 1, 2010 edition of 40 CFR Part 58-"Ambient Air Quality Surveillance", Part 58.12 "Operating Schedules and "Operating Schedules for PAMS Stations", Subpart G-Federal Monitoring, Appendix D-"Network Design Criteria for Ambient Air Quality Monitoring", Section 5.3, Table D–6 "Minimum Required PAMS Monitoring Locations and Frequencies". The sampling frequency for the ozone monitors is 7 days a week/24 hours a day (7/24). They sample continually with no media changes needed.

Section 4.2.0 Ozone – Sampling Equipment

Table 4.3 Ozone Sampling Equipment

Pollutant	Abbreviation	Sampler	FRM or FEM Method	Reported Data Interval	Parameter Code	Method Code
Ozone	O_3	Thermo 49	Yes	1 Hour	44201	047

Section 4.3.0 Ozone - Trend (Local/County),

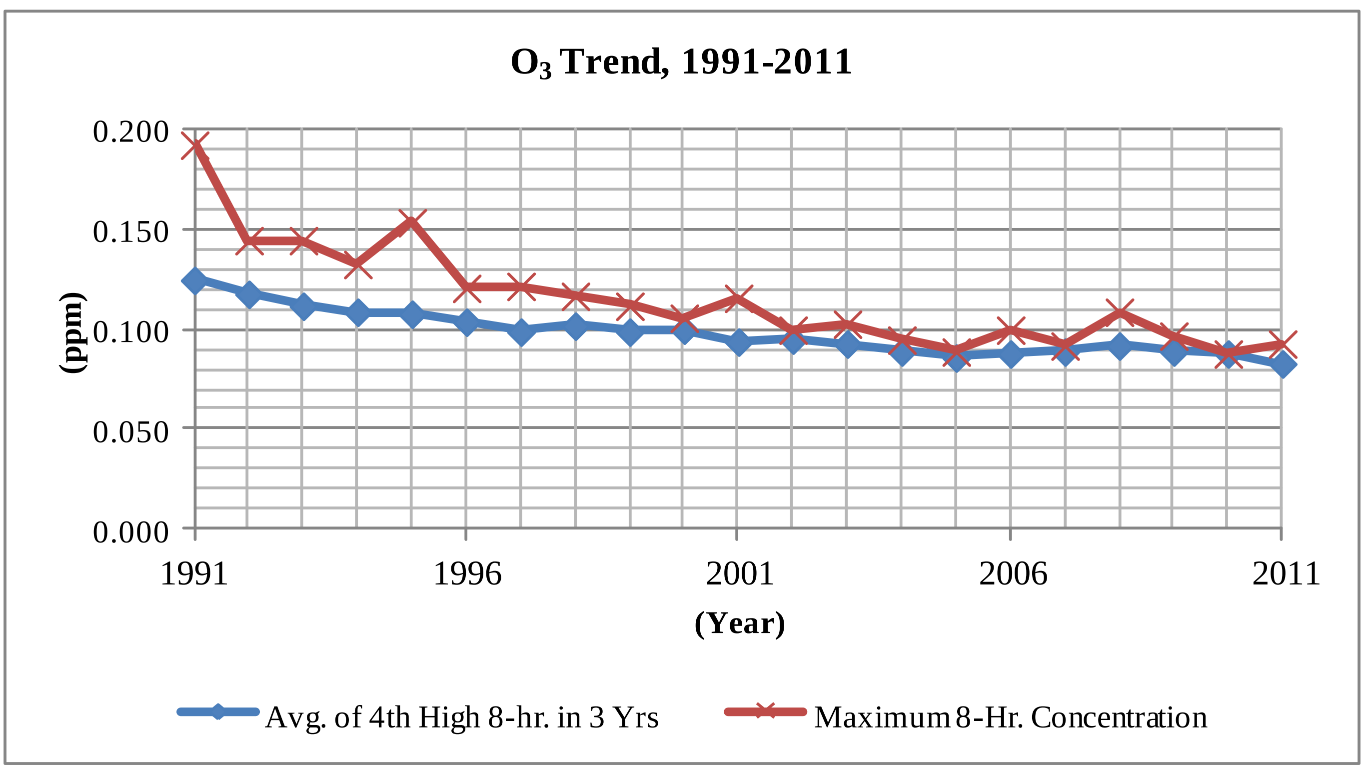
National ozone levels have decreased over the years and San Diego is no exception to this trend (Table 4.4 and Figure 4.2). Over the last several years, San Diego realized a significant decrease in the 3 yr average of the exceedance days for ozone and has seen a sharp decrease in its Air Quality Index since 1990. Please note, the "Days Above the Nat. 8-Hr. Std." row in Table 4.4 reflects the ozone standard for that year.

The San Diego Air Basin is the only one of the five major air basins in California the ARB has not identified as a transport contributor to a downwind area. The San Diego area is a transport receptor and as such, additional local emission controls will be needed to reach attainment of the ozone standards in the San Diego area. Future air quality in this area will also be affected by emission controls and growth in the South Coast Air Basin.

Table 4.4 Ozone Summary of Concentrations for the Last 20 Years

OZONE (ppm)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Avg. of 4th High 8-hr. in 3 Yrs	0.125	0.118	0.112	0.109	0.108	0.104	0.099	0.102	0.099	0.100	0.094	0.095	0.093	0.089	0.086	0.088	0.089	0.092	0.089	0.088	0.083
Maximum 8-Hr. Concentration	0.193	0.145	0.145	0.133	0.154	0.121	0.122	0.117	0.112	0.106	0.116	0.100	0.103	0.095	0.089	0.100	0.092	0.109	0.097	0.088	0.093
Days Above Nat. 8-Hr. Std.	112	105	91	90	94	64	43	58	44	46	43	31	38	23	24	38	27	35	24	14	10

Figure 4.2 Ozone Concentrations for the Last 20 Years Graph



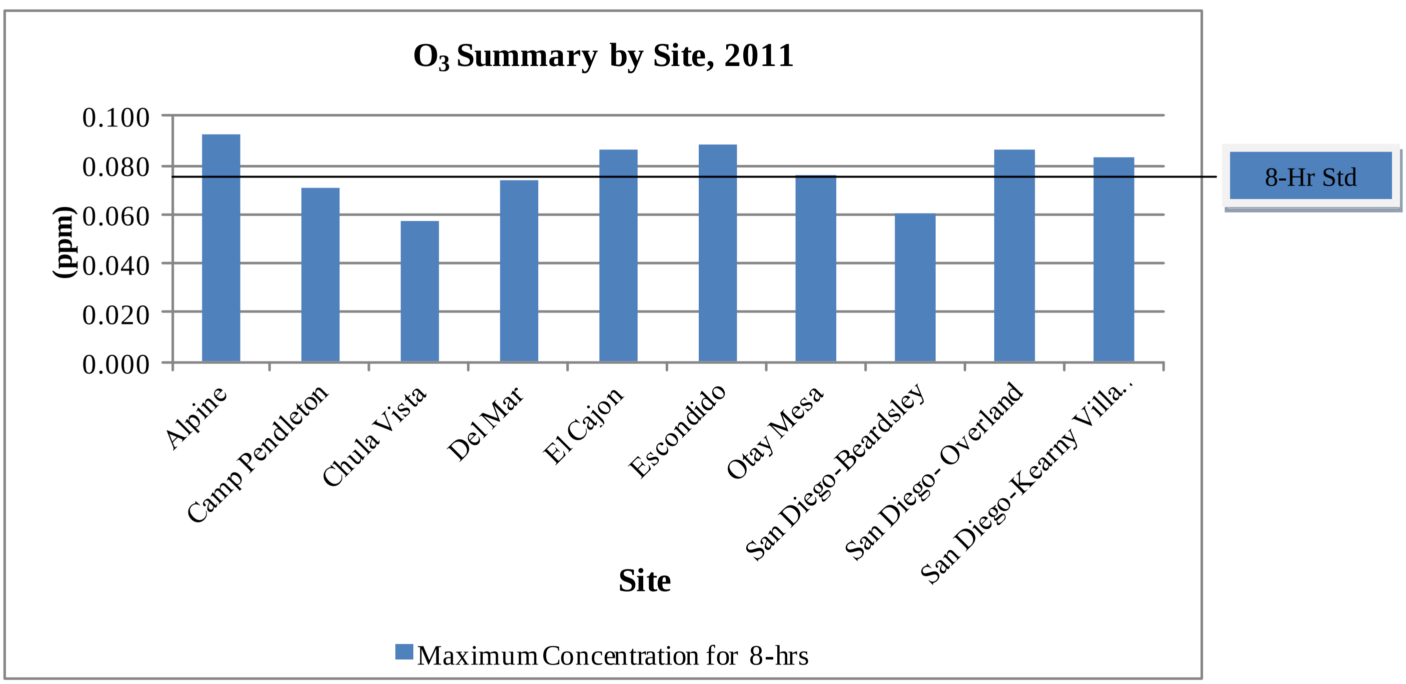
Section 4.4.0 Ozone Measurements by Site

Table 4.5 Ozone Measurements by Site

Location (name)	Maximum Concentration for 8-Hrs (ppm)	Number of Days Above the National Standard (#)	Annual Average (ppm)
Alpine	0.093	10	0.041
Camp Pendleton	0.071	0	0.032
Chula Vista	0.057	0	0.028
Del Mar	0.074	0	0.034
El Cajon	0.086	1	0.028
Escondido	0.089	2	0.028
Otay Mesa	0.076	1	0.025
San Diego-Beardsley	0.061	0	0.027
San Diego- Overland	0.086	1	0.031
San Diego-Kearny Villa Road*	0.083	0	0.030

*Due to tenancy issues, the San Diego-Kearny Villa Road site will replace the San Diego-Overland site.

Figure 4.3 Ozone Measurements by Site Graph



Section 4.5.0 Ozone - Design Criteria Requirements from the Code of Federal Regulations

Federal requirements for the number of monitors for ozone are in the CFR annual update on July 1 of every year. The 2010 edition of the 40 CFR Part 58-"Ambient Air Quality Surveillance", Subpart G-Federal Monitoring, Appendix D, Section 4-"Pollutant-Specific Design Criteria for SLAMS Sites", subsections 4.1(a) and (b) (see italics) are below. Please note, only the passages applicable to the SDAB have been cited.

4.1 Ozone (O_3) Design Criteria.

(a) State, and where appropriate, local agencies must operate O_3 sites for various locations depending upon area size (in terms of population and geographic characteristics) and typical peak concentrations (expressed in percentages below, or near the O_3 NAAQS). Specific SLAMS O_3 site minimum requirements are included in Table D–2 of this appendix. The NCore sites are expected to complement the O_3 data collection that takes place at single pollutant SLAMS sites, and both types of sites can be used to meet the network minimum requirements. The total number of O_3 sites needed to support the basic monitoring objectives of public data reporting, air quality mapping, compliance, and understanding O_3-related atmospheric processes will include more sites than these minimum numbers required in Table D–2 of this appendix. The EPA Regional Administrator and the responsible State or local air monitoring agency must work together to design and/or maintain the most appropriate O_3 network to service the variety of data needs in an area.

Table D–2 of Appendix D to Part 58— SLAMS Minimum O_3 Monitoring Requirements

MSA population [1,2]	*Most recent 3-year design value concentrations ≥85% of any O_3 NAAQS* [3]	*Most recent 3-year design value concentrations <85% of any O_3 NAAQS* [3,4]
> 10 million	*4*	*2*
4 – 10 million	*3*	*1*
350,000 –< 4 million	*2*	*1*
50,000 –< 350,000 [5]	*1*	*0*

[1] Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).
[2] Population based on latest available census figures.
[3] The ozone (O3) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.
[4] These minimum monitoring requirements apply in the absence of a design value.
[5] Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

(b) Within an O_3 network, at least one O_3 site for each MSA, or CSA if multiple MSAs are involved, must be designed to record the maximum concentration for that particular metropolitan area. More than one maximum concentration site may be necessary in some areas. Table D–2 of this appendix does not account for the full breadth of additional factors that would be considered in designing a complete O_3 monitoring program for an area.

Section 4.5.1 Ozone –Design Criteria for the SDAB Actual

The 8-Hour Design Value is based on the monitor that records the highest values. For the SDAB, this is the Alpine location (Table 4.6), which, due to geography, perennially records the highest concentrations in the County.

Table 4.6a Ozone 8-hour Design Value for the SDAB

Maximum 8-Hour Design Value (2009-2011) (ppb)	Is the Maximum 8-Hour Design Value < 85% of the NAAQS? (yes/no)	Meet NAAQS 2011 ? (yes/no)	Maximum 8-Hour Design Value Site (name)	Maximum 8-Hour Design Value Site AQS ID Number (#)
83	No	No	Alpine	06-073-1006

Table 4.6b Ozone Minimum Number of Monitors Needed

MSA (name)	County (name)	2011 Population from 2010 Census (#)	Minimum Number of Monitors Required (#)	Number of Active Monitors (#)	Number of Monitors Needed (#)
San Diego	San Diego	3.2 million	2	9*	None

*One monitor (Kearny Villa Road) is designated as a SPM for a parallel study with the Overland (Kearny Mesa) site for an eventual station relocation and is not included in the total.

Section 4.6.0 Ozone – Quality Control (QC) Practices for the Network

Requirements for Quality Control of criteria pollutants are in 40 CFR Part 50 and Part 58. Each criteria pollutant has a specific section. See Table 4.7 for the specific references and equipment.

The District utilizes an ozone laboratory standard that is sent to the CARB laboratory annually for certification. The ozone transfer standards are certified quarterly against the ozone laboratory standard.

Table 4.7 Ozone QC Measures

	Quality Control Measures		
	Calibration	Zero/Span	Precision Checks
Frequency	Every monitor 1/year and 25% monitors/quarter (QA Handbook Vol. II, App. D, Ozone, Calibration)	Ambient= Nightly	Ambient= Every 2 Weeks
Personnel	Manually performed by personnel who do not administer the audits	Automated	Manually performed by randomly selected personnel
Reference	40 CFR Part 50, App. D	No greater than Zero drift ≤ ± 0.5% FS Span drift ≤ ± 7%	40 CFR Part 58, App. A, Section 3.2.1 (Table A–2)
[redacted]			
Equipment Used (Calibrator)	Level I Dynamic Dilution Instrumentation used for calibrations & precision checks only	Level II Zero/Spans with Dynamic Dilution Instrumentation specific to that station	Level I Dynamic Dilution Instrumentation used for calibrations & precision checks only
Equipment Used (Transfer Std)	With a Level 3 O_3 transfer standard used for calibrations & precision checks only	Level II Zero/Spans with Dynamic Dilution Instrumentation specific to that station	With a Level 3 O_3 transfer standard used for calibrations & precision checks only
Diluent Used (Zero Air Generator)	Zero Air Generator used for calibrations & precision checks only	Zero Air Generator specific to that station	Zero Air Generator used for calibrations & precision checks only
Certifications	Calibrator= 2/yr Transfer Std= 4/yr Zero Air Generator=*	Calibrator (Level II)= n/a Zero Air Generator=*	Calibrator= 2/yr Transfer Std= 4/yr Zero Air Generator=*

*With the LDLs of the newer monitors lower than a cylinder of air, the District is in the process of developing a procedure to test the quality of the delivered air by using a zero air generator.

Section 4.7.0 Ozone – Quality Assurance (QA) Practices for the Network

Requirements for Quality Assurance of criteria pollutants are in the 40 CFR Part 58. Each criteria pollutant has a specific section. See Table 4.8 for the specific references and equipment.

The District utilizes an ozone laboratory standard that is sent to the CARB laboratory annually for certification. Ozone transfer standards that are certified quarterly with the laboratory standard.

Table 4.8 Ozone QA Measures

	Quality Assurance Measures	
	Internal Local Audits (District)	External State Audits (ARB)
Frequency	Every monitor 1/year and 25% monitors/quarter	75% of the monitors/year randomly selected
Personnel	With personnel who do not perform the calibrations	Manually performed by randomly selected personnel
Reference	40 CFR Part 58 App. A, Section 3.2.2	n/a
Equipment Used (Calibrator)	With Level I Dynamic Dilution Instrumentation used for audits only	With external Dynamic Dilution Instrumentation
Equipment Used (Transfer Std)	With a Level 3 O_3 transfer standard used for audits only	With an external O_3 transfer standard
Diluent Used	Zero Air Generator used for audits only	With external Zero Air Generator
Certifications	Calibrator= 2/yr Transfer Std= 4/yr Zero Air Generator=*	See ARB

*With the LDLs of the newer monitors lower than a cylinder of air, the District is in the process of developing a procedure to test the quality of the delivered air by using a zero air generator.

Section 4.8.0 Ozone – Changes to the Network

Official decommissioning of any monitor or monitoring location will be proposed in a letter with accompanying documentation to the EPA and, when appropriate, the ARB. If a station is to relocate, parallel sampling between the current location and the new location will be undertaken, when possible.

Section 4.8.1 Ozone – Changes to the Design Criteria Requirements from the Code of Federal Regulations for the Next Year

Ozone design criteria applicable to calendar year (CY) 2013 have not changed, so the information in Section 4.5.0 will apply to CY 2013.

Section 4.8.2 Ozone – Changes to the Equipment in the Network

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 trace level calibrators in mid-2011, the ozone monitors will be challenged for precision checks, calibrated, and audited at lower concentration levels. This could not be reliably done with previous calibrators. The range changes will occur quarterly, as each instrument undergoes its yearly calibration, starting in late-2012. Four Thermo 49i ozone monitors have been purchased to replace four worst performing Thermo 49 analyzers. They will be phased in the network from late 2012-early 2013.

Section 4.8.3 Ozone - Changes to Sampling Locations in the Network

Otay Mesa Station

The North American Free Trade Agreement (NAFTA) greatly increased the heavy truck traffic at the Otay Mesa border crossing. It is now the second busiest commercial truck border crossing in the United States and the busiest in California. This has forced the re-designation of the Otay Mesa station instruments from Neighborhood Scale to MicroScale and Impact levels. This station has O_3, NOx, meteorological equipment, and XonTechs 924 & 910A-Fused Silica Lined samplers for Toxics sampling.

To measure concentrations representative of the air mass in the south San Diego region, the District proposes to decommission the Otay Mesa border location and relocate the station about 3.3 kilometers northeast off the entrance road to the Donovan State Prison grounds (Google Earth coordinates of 32°34'41.80"N, 116°55'16.70"W). The proposed new station will house O_3, NOx, $PM_{2.5}$-Continuous (non-speciated), meteorological equipment, and XonTechs 924 & 910A-Fused Silica Lined samplers for Toxics sampling (plus collocation). Parallel sampling will be undertaken with O_3 and NOx, spare equipment permitting. The projected timeline for the relocation is late 2012-early 2013.

San Diego-Overland

Due to tenancy issues, the District relocated the San Diego-Overland (KMA) site in Kearny Mesa to a new location off Kearny Villa Road (KVR) in the 1^{st} Qtr of 2012. Since late 2010, O_3 has been collected in parallel at KVR with the KMA location. In late 2011, NOx has been collected in parallel at the KVR location with the KMA location (the District does not have the resources to run parallel sampling for the other pollutants at the KVR site). The new station houses O_3, NOx, PM_{10} (plus a collocated sampler), $PM_{2.5}$-Sequential (non-speciated, plus a collocated sampler), PAMS-Carbonyl equipment, and meteorological equipment.

Del Mar Station

With increased budgetary constraints, the District will investigate redirecting efforts to the new NO_2 roadway location with the equipment and monies from the Del Mar station. As evidenced by the EPA's Removal Bias tool, this station can be removed from the network with minimal bias, due to its duplicity in air quality concentration with the nearby Camp Pendleton station. The Del Mar location has an O_3 sampler and meteorological equipment.

Section 5.0.0 Nitrogen Dioxide (NO_2) Introduction

For 2011, ambient level nitrogen dioxide was sampled on a continuous basis at eight locations throughout the SDAB (Figure 5.1) and referenced to the Standards of 2011 (Table 5.1). The sampling equipment are listed in Tables 5.2 and 5.3. *Total oxides of nitrogen (NO_y) is sampled at the El Cajon location under the National Core (NCore) program. Please see section 11 – NCore for a complete list of all the requirements.*

Figure 5.1 Nitrogen Dioxide Network Map

Table 5.1 Nitrogen Dioxide State and Federal Standards for the Year

Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	Gas Phase Chemiluminescence	53 ppb (100 µg/m^3) (see footnote 8)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3) (see footnote 8)	None	

Table 5.2 Nitrogen Dioxide Sampling Network

	Abbreviation	ALP	CMP	CVA	ECA	ESC	OTM	DTN	KMA
	Name	Alpine	Camp Pendleton	Chula Vista	El Cajon	Escondido	Otay Mesa-Border Xing	San Diego-Beardsley	San Diego-Overland
	Address	2495A W. Victoria Dr.	21441 W. B St.	80 E. J St.	1155 Redwood Ave.	600 E. Valley Pkwy	1100B Paseo International	1110A Beardsley St.	5555 Overland Ave.
	Latitude	32° 50' 32" N	33° 13' 01" N	32° 37' 52" N	32° 47' 28" N	33° 07' 40" N	32° 33' 08" N	32° 42' 05" N	32° 50' 11" N
	Longitude	116° 46' 06" W	117° 23' 46" W	117° 03' 33" W	116° 56' 32" W	117° 04' 31" W	116° 56' 16" W	117° 08' 59" W	117° 07' 43" W
	AIRS ID	06 073 1006	06 073 1008	06 073 0001	06 073 0003	06 073 1002	06 073 2007	06 073 1010	06 073 0006
NO_2 (ambient)	Monitor Designation	PAMS, SLAMS	PAMS, SLAMS	SLAMS	PAMS, SLAMS	SLAMS	SLAMS	SLAMS	PAMS, SLAMS
	Sampling Method	CL	CL	CL	CL	CL	CL	CL	CL
	Spatial Scale	US	NS	NS	NS	NS	MI	NS	NS
	Monitoring Objective (federal)	RC	BL	RC	RC	RC	IM	RC	RC
	Monitoring Objective (local)						Trends		
	Analysis By	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD
	Sampling Frequency	7 / 24	7 / 24	7 / 24	7 / 24	7 / 24	7 / 24	7 / 24	7 / 24
	Equipment Manufacturer/Mode	Thermo 42C, API 200E	Thermo 42, API 200E	Thermo 42	Thermo 42C	Thermo 42	Thermo 42	Thermo 42	Thermo 42

GLOSSARY OF TERMS

Monitor Designation

- PAMS Photochemical Assessment Monitoring
- SLAMS State and Local Air Monitoring Stations
- SPM Special Purpose Monitoring
- NCore National Core
- QA Quality Assurance collocated
- CSN Chemical Speciation Network
- STN Speciation Trends Network
- CSM Community Scale Monitoring (SDAPCD)
- CA TAC California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

- CL Chemiluminescence
- CT Low volume, continuous sampler, size selective inlet
- 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
- IPMS Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale

- MI Micro Scale
- MS Middle 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

Section 5.1.0 Nitrogen Dioxide Sampling Frequency

Requirements for the sampling frequency of SLAMS monitors, including NCore for pollutants are in the July 1, 2010 edition of 40 CFR Part 58-"Ambient Air Quality Surveillance", section 58.12 "Operating Schedules and "Operating Schedules and for PAMS Stations", Subpart G-Federal Monitoring, Appendix D-"Network Design Criteria for Ambient Air Quality Monitoring", Section 5.3, Table D–6 "Minimum Required PAMS Monitoring Locations and Frequencies". The actual sampling frequency is in Table 5.2. The sampling frequency for the nitrogen dioxide monitors are 7 days a week/24 hours a day (7/24). They sample continually with no media changes needed.

Section 5.2.0 Nitrogen Dioxide - Sampling Equipment,

Table 5.3 Nitrogen Dioxide Sampling Equipment

Pollutant	Abbreviation	Sampler	FRM or FEM Method	Reported Data Interval	Parameter Code	Method Code
Nitrogen Dioxide	NO_2	Thermo 42/42C	Yes	1 Hour	42602	074
Nitrogen Dioxide	NO_2	API 200E	Yes	1 Hour	42602	099

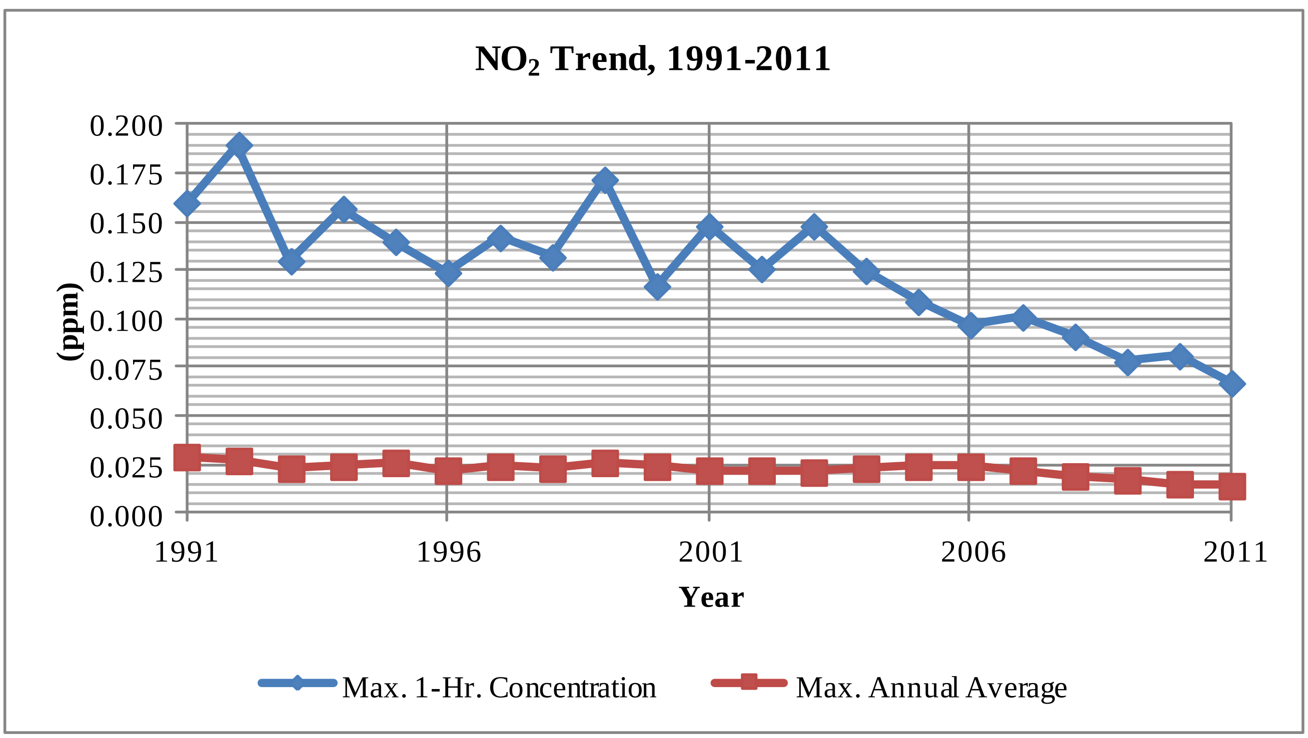
Section 5.3.0 Nitrogen Dioxide - Trends (Local/County)

As seen in Figure 5.2, emissions of NO_2 have decreased steadily over the years in the SDAB (Table 5.4). In 2010, the Otay Mesa sampling location designation was changed from neighborhood scale to microscale and from representative concentrations to source impact, due to the heavy truck traffic crossing the border within 100 m of the sampling location. The heavy vehicular emissions result in artificially low ozone levels (compared to the region) due to NO scavenging. The SDAPCD determined the NO_2 "Max. 1-Hr Concentration" and "Max. Annual Average" for the SDAB by omitting the Otay Mesa measured concentrations from the calculations (Table 5.4). As with the state and the country, the general downward trend is a result of improved emission control technology on mobile sources. NO_2 emissions should continue to decrease in the SDAB (Figure 5.2). The possible expansion of the Port of San Diego for increased shipping traffic may slow down the rate of decrease of NO_2 emissions. Please note, the "Days Above the Nat. 1-Hr Std." row in Table 5.4 reflects the nitrogen dioxide standard for that year.

Table 5.4 Nitrogen Dioxide Summary of Concentrations for the Last 20 Years

NITROGEN DIOXIDE (ppm)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Max. 1-Hr. Concentration	0.160	0.190	0.130	0.157	0.140	0.124	0.142	0.132	0.172	0.117	0.148	0.126	0.148	0.125	0.109	0.097	0.101	0.091	0.078	0.081	0.067
Max. Annual Average	0.029	0.027	0.023	0.024	0.026	0.022	0.024	0.023	0.026	0.024	0.022	0.022	0.021	0.023	0.024	0.024	0.022	0.019	0.017	0.015	0.014
Days Above Nat. 1-Hr. Std.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 5.2 Nitrogen Dioxide Concentrations for the Last 20 Years Graph



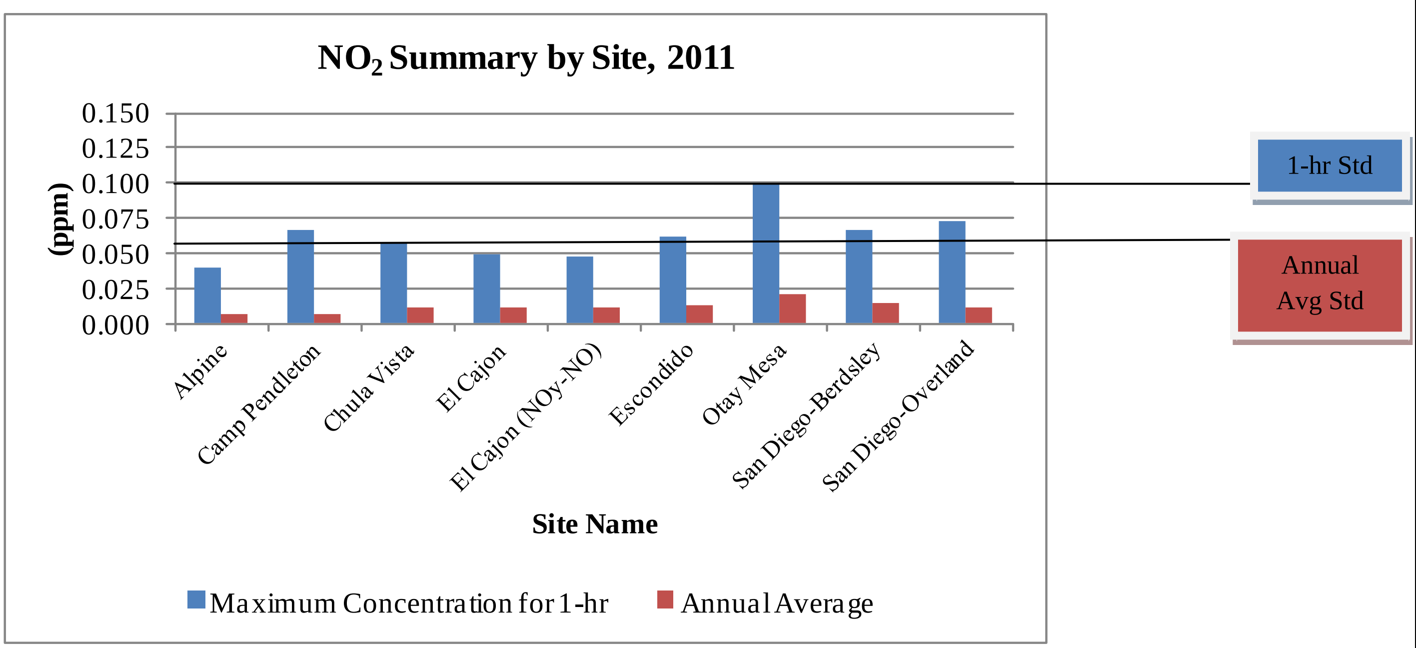
Section 5.4.0 Nitrogen Dioxide Measurements by Site

Table 5.5 Nitrogen Dioxide Measurements by Site

Location (name)	Maximum Concentration for 1-Hr (ppm)	Number of Days Above the National Standard (#)	Annual Average (ppm)
Alpine	0.040	0	0.006
Camp Pendleton	0.066	0	0.007
Chula Vista	0.057	0	0.012
El Cajon	0.049	0	0.012
El Cajon (NOy-NO= NO_2)	0.048	*	0.012
Escondido	0.062	0	0.013
Otay Mesa	0.100	0	0.020
San Diego-Beardsley	0.067	0	0.014
San Diego-Overland	0.073	0	0.012

*The NOy instrument does not have FRM designation, so it cannot be compared to the NAAQS.

Figure 5.3 Nitrogen Dioxide Measurements by Site Graph



Section 5.5.0 Nitrogen Dioxide Design Criteria Requirements from the Code of Federal Regulations

Federal requirements for the number of monitors for nitrogen dioxide are in the CFR annual update on July 1 of every year. The 2010 edition of 40 CFR Part 58-"Ambient Air Quality Surveillance", Subpart G-Federal Monitoring, Appendix D, Section 4-"Pollutant-Specific Design Criteria for SLAMS Sites, Subsections 4.3.1 (a) and 4.3.3 (a) (see italics below). Please note, only the passages applicable to the SDAB have been cited.

4.3.1 Nitrogen Dioxide (NO_2) Design Criteria.
(a) There are no minimum requirements for the number of NO_2 monitoring sites. Continued operation of existing SLAMS NO_2 sites using FRM or FEM is required until discontinuation is approved by the EPA Regional Administrator. Where SLAMS NO_2 monitoring is ongoing, at least one NO_2 site in the area must be located to measure the maximum concentration of NO_2.

4.3.3 Requirement for Area-wide NO_2 Monitoring
(a) Within the NO_2 network, there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO_2 concentrations representing the neighborhood or larger spatial scales. PAMS sites collecting NO_2 data that are situated in an area of expected high NO_2concentrations at the neighborhood or larger spatial scale may be used to satisfy this minimum monitoring requirement when the NO_2 monitor is operated year round. Emission inventories and meteorological analysis should be used to identify the appropriate locations within a CBSA for locating required area-wide NO_2 monitoring stations. CBSA populations shall be based on the latest available census figures.

Section 5.5.1 Nitrogen Dioxide - Design Criteria for the SDAB Actual

Monitoring for ambient nitrogen dioxide is not currently required anywhere in California in order to comply with requirements of 40 CFR Part 58, Appendix D. Ambient concentrations for these pollutants do not exceed the NAAQS and do not trigger requirements for monitoring. Table 5.6 illustrates the minimum number of ambient monitors required for San Diego.

Table 5.6 Nitrogen Dioxide Minimum Number of Ambient Monitors Needed

MSA (name)	County (name)	Maximum Expected Concentration Site (name)	Maximum Expected Concentration Site AQS ID Number (#)	Minimum Number of Ambient Monitors Required (#)	Number of Active Ambient Monitors (#)	Number of Ambient Monitors Needed (#)	Met NAAQS 2011 ? (yes/no)
San Diego	San Diego	*San Diego-Beardsley	06-073-1010	n/a	7*	None	No

*There are 8 active NO_2 monitors in the SDAB, but the heavy duty vehicular emissions at the Otay Mesa site result in artificially high NO_2 levels (compared to the region) and the monitor is no longer measuring representative concentrations (RC). The District determined compliance by omitting the Otay Mesa concentrations from the calculations.

5.6.0 Nitrogen Dioxide – Quality Control (QC) Practices for the Network

Requirements for Quality Control of the criteria pollutants are in 40 CFR Part 50 and Part 58 and the QA Handbook, Vol. II. Each criteria pollutant has a specific section. See Table 5.7 for the specific references and equipment.

Table 5.7 Nitrogen Dioxide QC Measures

	Quality Control Measures		
	Calibration	Zero/Span	Precision Checks
Frequency	Every monitor 1/year and 25% monitors/quarter (QA Handbook Vol. II, App. D, NO_2 Calibration; *NCore= 4/yr*	Ambient= Nightly; *NCore Zero= every 2 days* *NCore Span= every 4 days*	Ambient= Every 2 Weeks; *NCore= every 4 days*
Personnel	manually performed by personnel who do not administer the audits	Automated	Manually performed by randomly selected personnel; *NCore= automated*
Reference	40 CFR Part 50, App. F, QA Handbook Vol. II	No greater than Zero drift ≤ ± 0.5% FS Span drift ≤ ± 10%	40 CFR Part 58, App. A, Section 3.2.1 (Table A–2)
Equipment Used (Calibrator)	With Level I Dynamic Dilution Instrumentation used for calibrations & precision checks only; *NCore= Level I specific to that staion*	Level II Zero/Spans with Dynamic Dilution Instrumentation specific to that station; *NCore= Level I specific to that staion*	With Level I Dynamic Dilution Instrumentation used for calibrations & precision checks only; *NCore= Level I specific to that staion*
Gas Used	40 CFR Part 58 App. A, Section 2.6.1 (EPA Protocol I, ±1%)	Ambient= Blend of gases (±5%) *NCore= EPA Protocol I (±1%)*	40 CFR Part 58 App. A, Section 2.6.1 (EPA Protocol I, ±1%)
Diluent Used (Zero Air Generator)	Zero Air Generator used for calibrations & precision checks only; *NCore= specific to that station and used for calibrations, precision checks, and zero/spans*	Zero Air Generator specific to that station; *NCore= specific to that station and used for calibrations, precision checks, and zero/spans*	Zero Air Generator used for calibrations & precision checks only; *NCore= specific to that station and used for calibrations, precision checks, and zero/spans*
Certifications	Calibrator= 2/yr *Calibrator(NCore)= 4/yr* Zero Air Generator=*	Calibrator (Level II)= n/a *Calibrator(NCore)= 4/yr* Zero Air Generator=*	Calibrator= 2/yr *Calibrator(NCore)= 4/yr* Zero Air Generator=*

*With the LDLs of the newer monitors lower than a cylinder of air, the District is in the process of developing a procedure to test the quality of the delivered air by using a zero air generator.

5.7.0 Nitrogen Dioxide – Quality Assurance (QA) for the Network

The requirements for the Quality Assurance of criteria pollutants are in 40 CFR Part 58. Each criteria pollutant has a specific section. See Table 5.8 for the specific references and equipment.

Table 5.8 Nitrogen Dioxide QA Measures

	Quality Assurance Measures	
	Internal Local Audits (District)	External State Audits (ARB)
Frequency	Every monitor 1/year and 25% monitors/quarter; *NCore=1/qtr*	75% of the monitors/year randomly selected
Personnel	With personnel who do not perform the calibrations	Manually performed by randomly selected personnel
Reference	40 CFR Part 58 App. A, Section 3.2.2	n/a
Equipment Used (Calibrator)	With Level I Dynamic Dilution Instrumentation used for audits only	With external Dynamic Dilution Instrumentation
Gas used	40 CFR Part 58 App. A, Section 2.6.1 (EPA Protocol I, ±1%)	See ARB
Diluent Used	Zero Air Generator used for audits only	External Zero Air Generator
Certifications	Calibrator= 2/yr Zero Air Generator=*	See ARB

*With the LDLs of the newer monitors lower than a cylinder of air, the District is in the process of developing a procedure to test the quality of the delivered air by using a zero air generator.

5.8.0 Nitrogen Dioxide – Changes to the Network

Official decommissioning of any monitor or monitoring location will be proposed in a letter with accompanying documentation to the EPA and, when appropriate, the ARB. If a station is to relocate, parallel sampling between the current location and the new location will be undertaken, when possible.

5.8.1 Nitrogen Dioxide – Changes to the Design Criteria Requirements from the Code of Federal Regulations

Nitrogen dioxide design criteria applicable to calendar year (CY) 2013 have changed by the addition of a different type of NO_2 monitoring (see italics below) only. Please note, only the passages applicable to the SDAB have been cited. The creation of a new near-road (also called roadway) NO_2 monitoring program will increase the number of monitors (see Table 5.9).

4.3.2 Requirement for Near-road NO_2 Monitors

(a) Within the NO_2 network, there must be one microscale near-road NO_2 monitoring station in each CBSA with a population of 500,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high AADT counts as specified in paragraph 4.3.2(a)(1) of this appendix. An additional near-road NO_2 monitoring station is required for any CBSA with a population of 2,500,000 persons or more, or in any CBSA with a population of 500,000 or more persons that has one or more roadway segments with 250,000 or greater AADT counts to monitor a second location of expected maximum hourly concentrations. CBSA populations shall be based on the latest available census figures.

(1) The near-road NO_2 monitoring stations shall be selected by ranking all road segments within a CBSA by AADT and then identifying a location or locations adjacent to those highest ranked road segments, considering fleet mix, roadway design, congestion patterns, terrain, and meteorology, where maximum hourly NO_2 concentrations are expected to occur and siting criteria can be met in accordance with appendix E of this part. Where a State or local air monitoring agency identifies multiple acceptable candidate sites where maximum hourly NO_2 concentrations are expected to occur, the monitoring agency shall consider the potential for population exposure in the criteria utilized to select the final site location. Where one CBSA is required to have two near-road NO_2 monitoring stations, the sites shall be differentiated from each other by one or more of the following factors: fleet mix; congestion patterns; terrain; geographic area within the CBSA; or different route, interstate, or freeway designation.

(b) Measurements at required near-road NO_2 monitor sites utilizing chemiluminescence FRMs must include at a minimum: NO, NO_2, and NO_X.

Table 5.9 Minimum Number of Near-road Monitors Needed

MSA (name)	County (name)	2011 Population from 2010 Census (#)	Minimum Number of Monitors Required (#)	Are Additional Monitors Required (yes/no)	Minimum Number of Additional Monitors Required (#)	Total Number of Monitors Required (#)	Total Number of Active Monitors (#)	Total Number of Monitors Needed (#)
San Diego	San Diego	3.2 million	1	Yes	1	2*	0	2*

*The District plans to use a phased approach to the implementation of the near-road sites. After the required NO_2 near-road site is identified, installed, and made operational, an in-depth analysis of the data from this location will be undertaken to determine if the additional near-road location will be necessary, once funding is available for the additional site.

Table 5.10 NO_2 ALL Type of Monitors Design Criteria for the Minimum Number Needed

Minimum Number of Required Near-road Monitors (#)	Number of Active Near-road Monitors (#)	Minimum Number of Required Additional Near-road Monitors (#)	Number of Active Additional Near-road Monitors (#)	Total Number of Near-road Monitors Needed (#)	Minimum Number of Ambient Monitors (#)	Number of Active Ambient Monitors (#)	Number of Ambient Monitors Needed (#)
1	0	1*	0	2*	7**	7	0

*The District plans to use a phased approach to the implementation of the near-road sites. After the required NO_2 near-road site is identified, installed, and made operational, an in-depth analysis of the data from this location will be undertaken to determine if the additional near-road location will be necessary, once funding is available for the additional site.

** There are no minimum requirements for the number of NO_2 monitoring sites. Continued operation of existing SLAMS NO_2 sites using FRM or FEM is required until discontinuation is approved by the EPA Regional Administrator.

5.8.2 Nitrogen Dioxide – Changes to the Equipment

The District purchased six Thermo 42i NO_2 monitors to replace the worst performing Thermo 42 NOx monitors. The new analyzers were installed in the 4th quarter of 2011 and 1st quarter of 2012.

The District is in the process of purchasing two more Thermo 42i NO_2 monitors to replace the last two Thermo 42C NOx monitors in the network. They are projected to be installed in late 2012-early 2013.

El Cajon station

In 2011 the monitor designation was changed from urban scale (US)/source impact (SI) to neighborhood scale (NS)/representative concentrations (RC).

5.8.3 Nitrogen Dioxide - Changes to Sampling Locations

Otay Mesa station

The North American Free Trade Agreement (NAFTA) greatly increased the heavy truck traffic across the Otay Mesa border. It is now the second busiest commercial truck border crossing in the United States and the busiest in California. This has forced the re-designation of the Otay Mesa station instruments from Neighborhood Scale to MicroScale and Impact levels. This station has O_3, NOx, PM_{10}, meteorological equipment, and a XonTechs 924 & 910A-Fused Silica Lined samplers for Toxics sampling.

To measure concentrations representative of the air mass in the south San Diego region, the District proposes to decommission the Otay Mesa border location and relocate the station about 3.3 kilometers northeast off the entrance road to the Donovan State Prison grounds (Google Earth coordinates of 32°34'41.80"N, 116°55'16.70"W). The proposed new station will house O_3, NOx, $PM_{2.5}$-Continuous (non-speciated), meteorological equipment, and XonTechs 924 & 910A-Fused Silica Lined samplers for Toxics sampling (plus collocation). Parallel sampling will be undertaken with O_3 and NOx, spare equipment permitting. The projected timeline for the relocation is late 2012-early 2013.

San Diego-Overland

Due to tenancy issues, the District relocated the San Diego-Overland (KMA) site in Kearny Mesa to a new location off Kearny Villa Road (KVR) in the 1st Qtr of 2012. Since late 2010, O_3 has been collected in parallel at KVR with the KMA location. In late 2011, NOx has been collected in parallel at the KVR location with the KMA location (the District does not have the resources to run parallel sampling for the other pollutants at the KVR site). The new station houses O_3, NOx, PM_{10} (plus a collocated sampler), $PM_{2.5}$-Sequential (non-speciated, plus a collocated sampler), PAMS-Carbonyl equipment, and meteorological equipment.

5.8.3.a NO_2 Near-road Site

The near-road monitoring location(s) is to be sited where the maximum hourly concentration for NO_2 is expected to occur. The EPA "Near-Road NO_2 Monitoring Technical Assistance Document (TAD)" has several siting criteria that include, but are not limited to the following:

- ✓ The practicality of installing a full station with a rooftop deck.
- ✓ The gradient of the location, above, below, or even with the road.
- ✓ Surrounding roadside structures.
- ✓ Direction of the prevailing wind with respect to the sampling location.
- ✓ The ability to deliver power to the location in a cost effective manner.
- ✓ Security of the location.
- ✓ Is there supporting infrastructure within 50m -100m to facilitate a Near-road station, e.g. roadside business, graded land, power poles, telephone lines, etc?
- ✓ Is the site on a highly dangerous location, e.g. on a curve (even or below)?
- ✓ Is there a frontage or auxiliary road of safe egress and regress? If the only access to the location is the highway, the District will downgrade the location for safety reasons.
- ✓ Can the site be reasonably secured from illegal activities, e.g. areas that have no neighborhood structures within 50 – 100m, to keep personnel safe?

The District has augmented the EPA siting needs to add if prospective location can be sited with the requirements listed above and others in the Near-road TAD within the budget allotted by the EPA? For the tables, all parameters are with respect to the primary freeway. Other than reference number 1, all the junctions are above or below the primary freeway and station siting there is impossible or severely cost prohibitive. All information is from CALTRANS.

Table 5.11 Top 10 Traffic Volume Locations from CALTRANS

Ref. No. (#)	Ranking (#)	Primary Freeway (#)	Junction (name)	Relationship of the Junction to the Primary Freeway (above/below/even)	Roadway Design (above/below/even)
1	1	Interstate 15	Route 163	even	even
2	2	Interstate 15	Miramar/Pomerado Rd.	above	no
3	3	Interstate 8	Interstate 15	above	no
4	4	Interstate 15	Poway Rd.	above	no
5	5	Interstate 5	Route 94	above	possibly even
6	6	Interstate 5	Route 163	below	yes
7	7	Interstate 5	Leucadia Blvd.	above	possibly even
8	8	Interstate 8	Route 163	below	possibly even
9	9	Interstate 5	Route 78 East	above	no
10	10	Interstate 15	Route 78	below	possibly even

Table 5.12 is a matrix of the top 10 candidates for NO_2 roadway monitoring. A brief comment section discusses preliminary observations as to viability for eventual implementation in 2014.

Table 5.12 Matrix of NO_2 Near-road locations

Location	Rep	Rep	Rep	Rep	Rep	Rep	Rep	Rep	Rep	Rep
Ref. No. Primary Fwy/ Junction	1 I 15 / R 163	2 I 15/ Pomerado Rd	3 I 8 / I 15	4 I 15 / Poway Rd	5 I 5 / R 94	6 I 5 / R 163	7 I 5/ Leucadia Bl	8 I 8 / R 163	9 I 5 / R 78E	10 I 15 / R 78W
Road Type	CAH	CAH	CAH	CAH	CAH	CAH	CAH	CAH	CAH	CAH
Vehicle AADT	296,000	293,000	240,000	236,000	208,000	208,000	208,000	200,000	198,000	194,000
AADT Ranking	1	2	3	4	5	6	7	8	9	10
HD Count	11,041	11,017	7,200	16,756	8,320	7,696	9,381	5,400	9,524	13,774
HD Ranking	3	4	9	1	7	8	6	10	5	2
FE AADT	395,369	392,153	304,800	386,804	282,880	277,264	292,429	248,600	283,716	317,966
FE Ranking	1	2	5	3	8	9	6	10	7	4
Congestion Information (LOS rating)	F (2008 Sandag)	F (2008 Sandag)	F (2008 Sandag)	F (2008 Sandag)	E/F (2008 Sandag)	E/F (2008 Sandag)	E (2008 Sandag)	F (2008 Sandag)	E (2008 Sandag)	E (2008 Sandag)
Terrain	flat	slopes up	flat	slopes up	slopes up	8-Flat; 163-slope up	slope up	slope up	slope up	gentle slope up
Meteorology	downwind	downwind	downwind	downwind	downwind	downwind	downwind	downwind	downwind	downwind
*Road Segment End Points	32° 15’47.72”N 117° 06’34.56”W	32° 53’38.69”N 117° 06’51.93”W	32° 46’41.23”N 117° 06’42.09”W	32° 56’49.94”N 117° 06’20.12”W	32° 42’47.85”N 117° 08’49.30”W	32° 43’26.03”N 117° 08’49.58”W	33° 03’53.41”N 117° 17’29.67”W	32° 45’42.22”N 117° 09’45.55”W	33° 10’36.10”N 117° 21’01.31W	33° 07’33.77”N 117° 21’02.12”W
Population Exposure	HDH 4.1 km NE 2.6 km SE; MBD 2.8 km SE 4.0 km NW School1 4.0 km NE School2 4.1 km NE	HDH 1.3 km E 6.1 km S; MBD 0.5 km W 6.1 km W School1 0.5 km NE School2 1.5 km NE	H 0.5 km S 1.8 km NE HDH 1.8 km NW BD 0.8 km E MBD 2.9 km W Stadium1 0.8 km NW	H 1.0 km E 0.3 km W	H 0.2 km NE 0.2 km SE BD 0.2 km NE 0.2 km SE Stadium2 1.1 km SE Airport1 3.2 km NW	H 0.2 km SW 1.1 km SE SC 0.2 km SW BD 0.2 km NW 0.5 km SW Stadium2 1.7 km SW Airport1 2.3 km NW	H 0.2 km in all directions Beach 1.3 km W	H 0.6 km SE 1.1 km NW MBD 0.2 km E 0.5 km NE Stadium1 4.2 km NE	H 0.3 km NE 0.3 km NW 1.0 km SE 0.9 km SW BD 0.5 km E Beach 1.7 km W	H 1.0 km NW 0.8 km NE BD 0.2 km SE 0.2 km SW Hospital1 1.7 km SE Hospital2 1.6 km SW
Roadway Design	flat	flat; above highway 15	flat; even highway 8	flat; even highway 15	flat; even highway 94	-60° slope between highways	flat; even Leucadia Blvd.	flat; even highway 8	flat; even highway 78	flat; even highway 78
Roadside Structures	none	junction overpass	junction overpass	junction overpass	junction overpass	none	junction overpass	none	junction overpass	none
Safety Features	none	none	none	none	none	none	none	none	none	none
Infrastructure	highway and building light= 100 m	highway sign light= 65 m	highway light= 20 m	street light= 120 m	highway light= 65 m	highway light= 30 m	street sign light= 15 m	Parking lot light= 10 m	highway light= 15 m	highway sign light= 60 m
Interchanges	Pomerado/ 15 I= 3000m	15/163 M = 3000m	8/805 I = 1950m	15/56 I = 2100m	5/163 I = 1400m	5/94 I = 1400m	none	5/8 I =3800m; 805/8 I = 3300m	5/76 M =4100m	none
Surrounding Land Use	military	residential	business	residential	residential	business	residential	business	housing	business

Nearby Sources	none	none	none	none	none	none	none	none	none	none
Current Road Construction	no	yes	no	yes	no	no	no	no	no	no
Future Road Construction	unknown	unknown	unknown	unknown	possibly	posssibly	unknown	unknown	unknown	unknown
Frontage Roads	yes; part of plan	no	yes; part of plan	yes; part of plan	no	no	yes; not part of plan	yes; not part of plan	no	no
Available Space	yes	NASA	unknown	NASA unknown	unknown	NASA	NASA	unknown	NASA	NASA
Property Type	Military storage	NASA	un-developed	private	private	NASA	NASA	private	NASA	NASA
Property Owner	Caltrans	NASA	possibly the City	possibly the County	NASA	NASA	NASA	private	NASA	NASA
Likelihood of Access	unknown	NASA	none	none	none	NASA	NASA	marginal	NASA	NASA
Other	Comment 1	Comment 2	Comment 3	Comment 4	Comment 5	Comment 6	Comment 7	Comment 8	Comment 9	Comment 10

Legend for Table 5.12

* The top ten sites for the SDAB are intersections or merge points with no cross start and end point listed. We listed the probable location for each site as a point within the intersection with latitude and longitudinal coordinates.

BD= Business District
CAH= Controlled Access Highway
H= Houses (single family dwellings)
HDH= High Density Housing (condominium, apartments, & houses)
I=Interchange
M= Merge
MBD= Major Business District
NASA= No Apparent Space Available
Rep= Representative of a Whole Road Segment
SH= Schools (K-12 and/or high school); SC= Schools (college)
SSH= Several Schools (K-12, high school, College)
UPW= Upwind
Congestion Ratings= LOS F= worst, LOS E= 2^{nd} worst

Comments

This section is for the comments from Table 5.12. The red lines in the figures illustrates where the 50 m demarcation line for station placement. The operational zone of the new NO2 roadway stations are to be within 50 m of the road(s) in question. Candidates #2 - #10 are all junctions, either highway-to-highway, highway-to-road, or highway-to-route, so the operational zone was drawn from the midpoint of the junction out/perpendicular 50 m and then a line was drawn horizontal to the first line. This makes a “boxed” area and then ideal placement of the new station is to be situated within this boxed area. Please note, all station placements were planned in the prevailing downwind, which is on the southeast side of all 10 roadway candidates.

1. The Interstate 15-Route 163 merge (Figure 5.4) site is the only location that has the junction/merge are flat and even with each other. It is the only location that has security (it is on the Miramar Marine Corps Air Station aka MMCAS). There is a frontage road for safe access. There is a strong possibility that there is readily available power. This location is within the flight path of the planes from MMCAS, so power poles will probably be prohibited and possibly the meteorology tower. The cost of underground power is routinely a four-fold increase over power poles and will greatly exceed the grant monies for the program. Another big obstacle will be obtaining local military and Federal permission for right-of-passage. This is a multi-Agency process that may take several months.

Figure 5.4 Interstate 15-Route 163 Merge

2. The Interstate 15-Pomerado Rd. junction (Figure 5.2) is typical of the remaining candidates on the list in that the main highway, in this case Interstate 15, have no safety structures to use as a barrier for personnel safety, as well as site security. There is only a small patch of land along the highway with only freeway access to any proposed site along the main highway. The junction, Pomerado Rd, is elevated and there is an exit or entrance highway ramp. As with the main freeway, the land within the ramps are not safe, secure, offer no safe way to access the inner circle, and, additionally, is at an angle. There is no frontage road access.

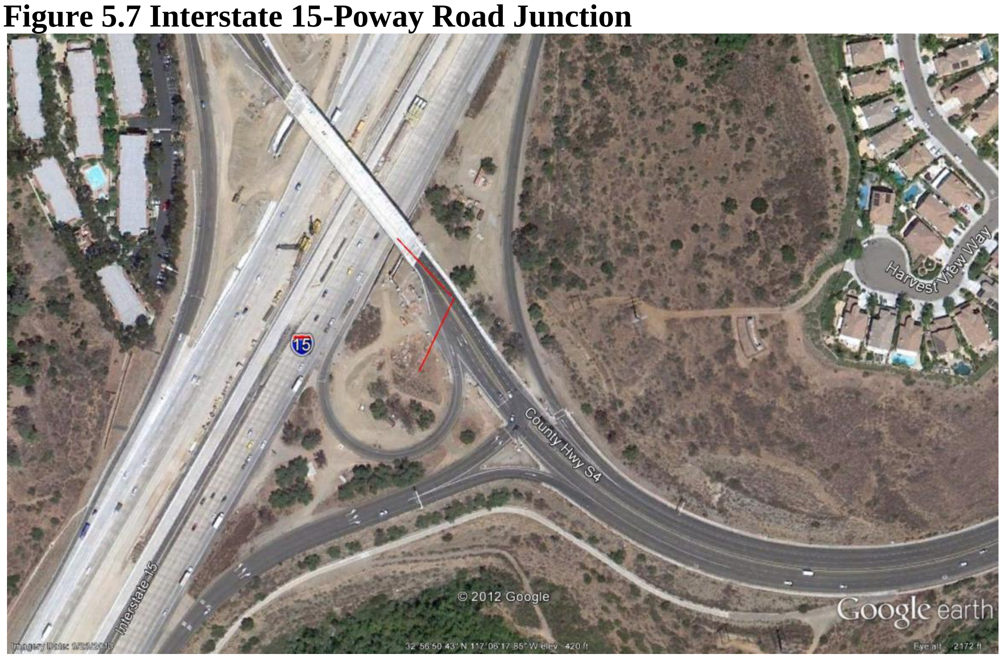
Figure 5.5 Interstate 15-Pomerado Rd. Junction

3. The Interstate 8-Interstate 15 junction (Figure 5.6) has no safety structures to use as a barrier for personnel safety, as well as site security. There is only a patch of land within the freeway on-ramp circle and with only freeway off-ramp access to any proposed site within this area. Also, there are several large trees within the circle. The junction, Interstate 15, is elevated and there is no land along the 15 to use for site placement. No apparent source of ready power.

Figure 5.6 Interstate 8-Interstate 15 Junction

4. The Interstate 15-Poway Road junction (Figure 5.7) has no safety structures to use as a barrier for personnel safety, as well as site security. There is only a patch of land within the freeway on-ramp circle and with only Poway Road freeway on-ramp access to any proposed site within this area. Also, this area is under construction. No apparent source of ready power.

Figure 5.7 Interstate 15-Poway Road Junction

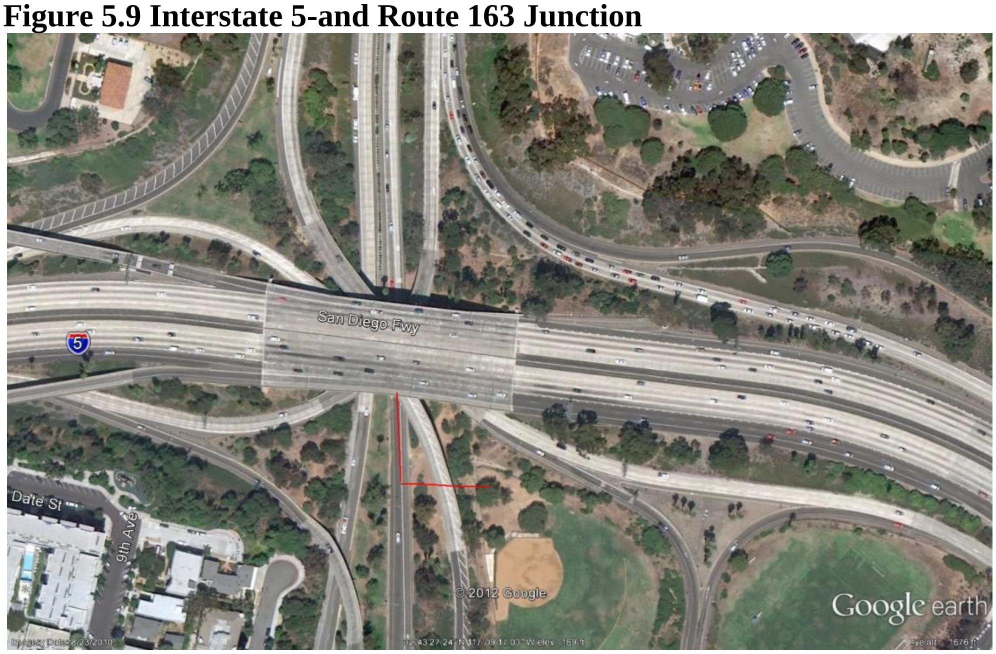


5. The Interstate 5-Route 94 junction (Figure 5.8) has no safety structures to use as a barrier for personnel safety, as well as site security. Ready power appears available. The area within the red lines have severe slopes and site placement appears unattainable. Additional security logistics will have to addressed also. There is a possibility of urban redevelopment in this general area.

Figure 5.8 Interstate 5- Route 94 Junction

6. The Interstate 5-and Route 163 junction (Figure 5.9) has no safety structures to use as a barrier for personnel safety, as well as site security. Ready power appears available. The area within the red lines have severe slopes and site placement appears unattainable. Additional security logistics will have to addressed also. No access roads to probable location.

Figure 5.9 Interstate 5-and Route 163 Junction

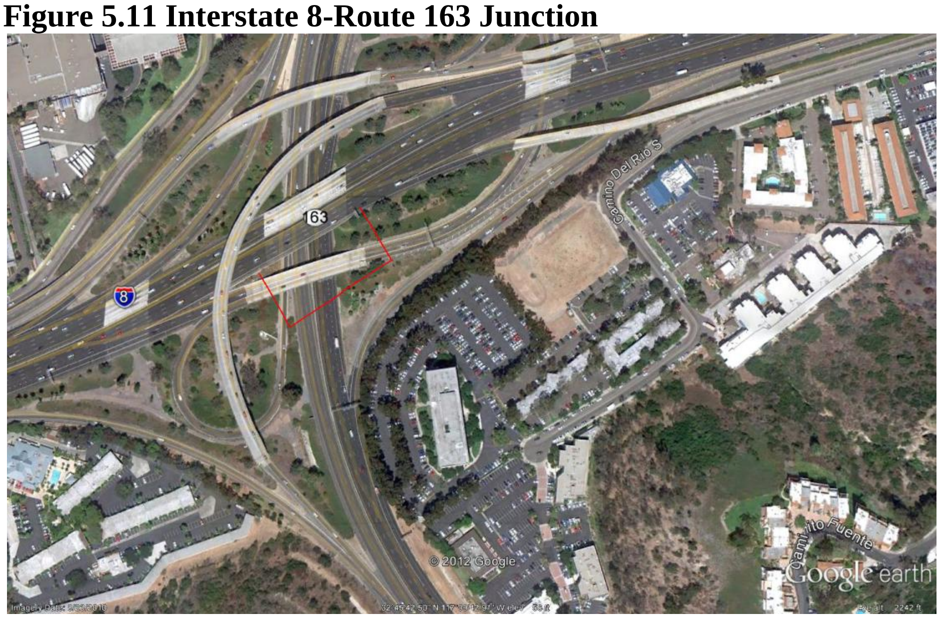


7. The Interstate 5-Leucadia Blvd. junction (Figure 5.10) has no safety structures to use as a barrier for personnel safety, as well as site security. Ready power appears available. The area within the red lines have severe slopes and site placement appears unattainable. The only access to the area is via the freeway off-ramp.

Figure 5.10 Interstate 5-Leucadia Blvd. Junction

8. The Interstate 8-Route 163 junction (Figure 5.11) has no safety structures to use as a barrier for personnel safety, as well as site security. There is only a patch of land within the freeway on and off-ramp circles to any proposed site within this area. They "circles" both have gulley configurations. Also, there are several large trees within the circle. The junction, Route 163, is elevated and there is no land along the 163 to use for site placement. There does appear to be readily available power.

Figure 5.11 Interstate 8-Route 163 Junction

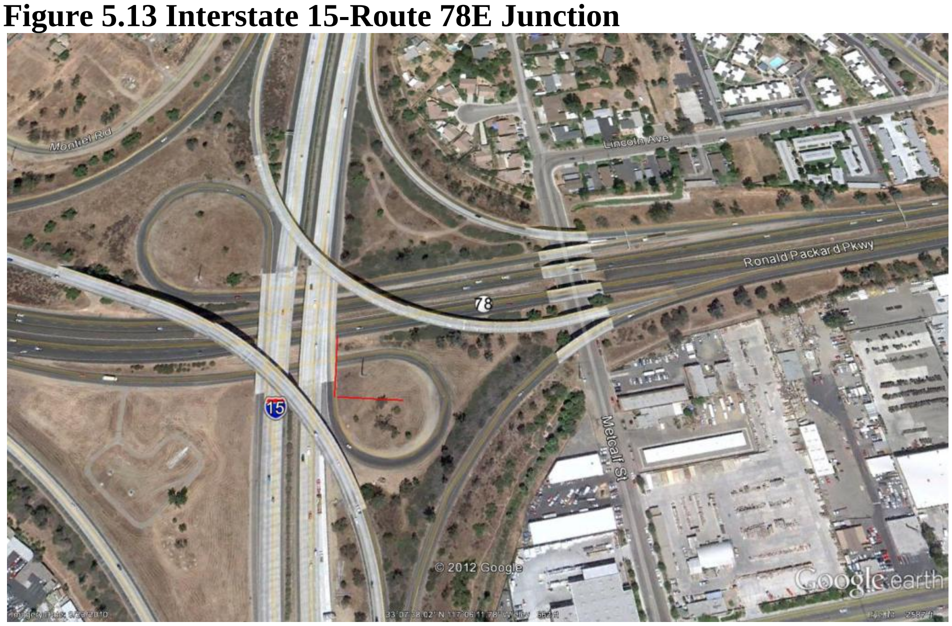


9. The Interstate 5-Route 78E junction (Figure 5.12) junction has no safety structures to use as a barrier for personnel safety, as well as site security. There is only a patch of land within the freeway on-ramp circle and with only Poway Road freeway on-ramp access to any proposed site within this area. The area within the "circle" is sloped. There appears to be a source of readily available power.

Figure 5.12 Interstate 5-Route 78E Junction

10. The Interstate 15-Route 78E junction (Figure 5.13) has no safety structures to use as a barrier for personnel safety, as well as site security. There is only a patch of land within the freeway on-ramp circle and with only freeway on-ramp access to any proposed site within this area. The area within the "circle" is just gently sloped. There appears to be a source of readily available power.

Figure 5.13 Interstate 15-Route 78E Junction



Section 6.0.0 Carbon Monoxide (CO) Introduction

For 2011, carbon monoxide (CO) was sampled on a continuous basis at three locations in the SDAB (Figure 6.1) and referenced to the Standards of 2011 (Table 6.1). The sampling equipment are listed in Tables 6.2 and 6.3. Trace level CO was sampled at the El Cajon-NCore site. *For NCore details, Please see section 11 – NCore for a complete list of all the requirements.*

Figure 6.1 Carbon Monoxide Network Map

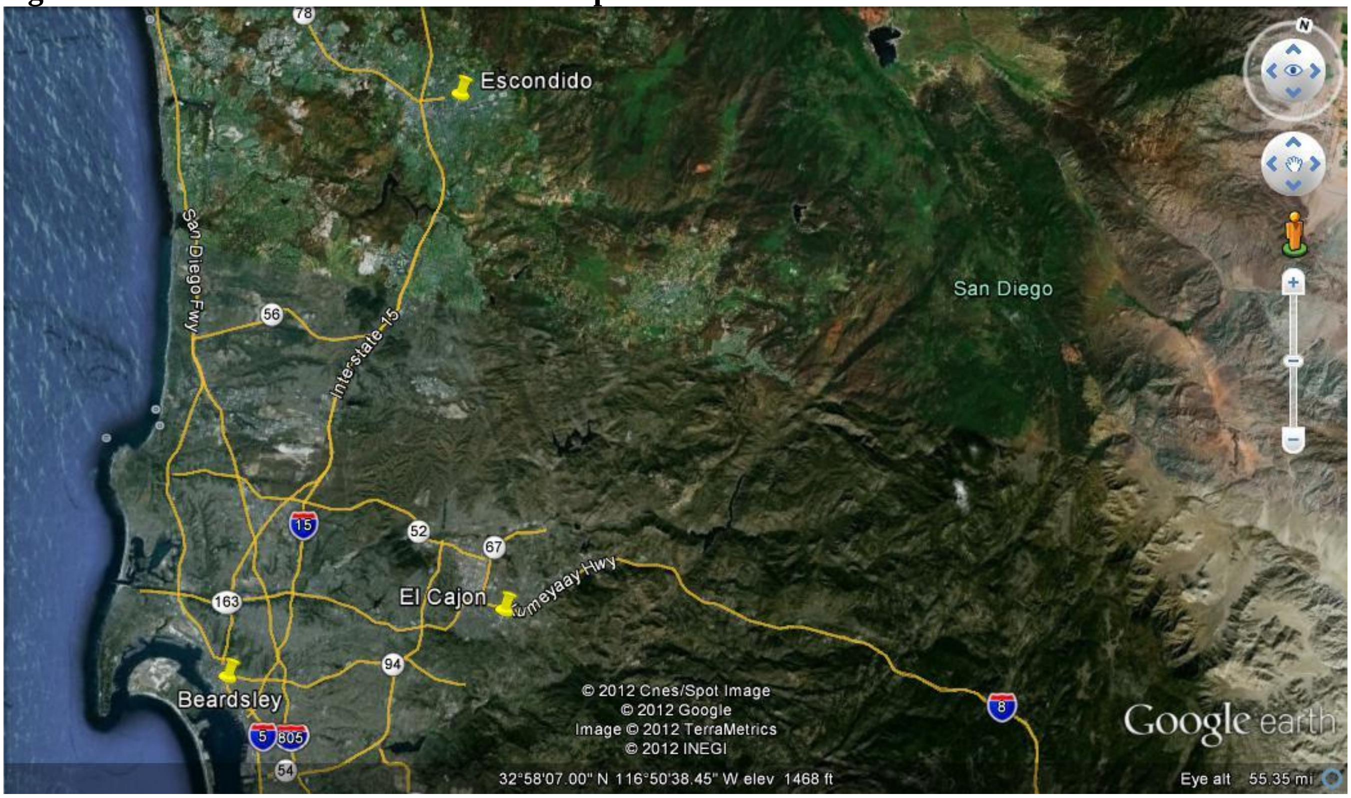


Table 6.1 Carbon Monoxide State and Federal Standards for the Year

Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—

Table 6.2 Carbon Monoxide Sampling Network

	Abbreviation	ESC	DTN	ECA
	Name	Escondido	San Diego-Beardsley	El Cajon
	Address	600 E. Valley Pkwy	1110A Beardsley St.	1155 Redwood
	Latitude Longitude	33° 07' 40" N 117° 04' 31" W	32° 42' 05" N 117° 08' 59" W	32° 47' 28" N 116° 56' 32" W
	AIRS ID	06 073 1002	06 073 1010	06 073 0003
CO (ambient)	Monitor Designation	SLAMS	SLAMS	NCore
	Sampling Method	IR	IR	IR
	Spatial Scale	NS	NS	NS
	Monitoring Objective (Federal)	RC	RC	RC
	Monitoring Objective (Local)		SIPM	
	Analysis By	SDAPCD	SDAPCD	SDAPCD
	Sampling Frequency	7 / 24	7 / 24	7 / 24
	Equipment Manufacturer/Mode	Thermo 48i	Thermo 48i	Thermo 48i - T.L.E.

GLOSSARY OF TERMS

Monitor Designation

- PAMS Photochemical Assessment Monitoring
- SLAMS State and Local Air Monitoring Stations
- SPM Special Purpose Monitoring
- NCore National Core
- QA Quality Assurance collocated
- CSN Chemical Speciation Network
- STN Speciation Trends Network
- CSM Community Scale Monitoring (SDAPCD)
- CA TAC California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

- CL Chemiluminescence
- CT Low volume, continuous sampler, size selective inlet
- 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
- IPMS Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale

- MI Micro Scale
- MS Middle 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

Section 6.1.0 Carbon Monoxide – Sampling Frequency

Federal requirements for the sampling frequency of SLAMS monitors, including NCore, for pollutants are in July 1, 2010 edition of the 40 CFR Part 58-“Ambient Air Quality Surveillance”, section 58.12-“Operating Schedules”. The sampling frequency for the carbon monoxide monitors are 7 days a week / 24 hours a day (7/24). They sample continually with no media changes needed.

Section 6.2.0 Carbon Monoxide - Sampling Equipment

Table 6.3 Carbon Monoxide Sampling Equipment

Pollutant	Abbreviation	Sampler	FRM or FEM Method	Reported Data Interval	Parameter Code	Method Code
Carbon Monoxide	CO	Thermo 48i	Yes	1 Hour	42101	054
Carbon Monoxide	CO	Thermo 48i-T.L.E.	Yes	1 Hour	42101	554

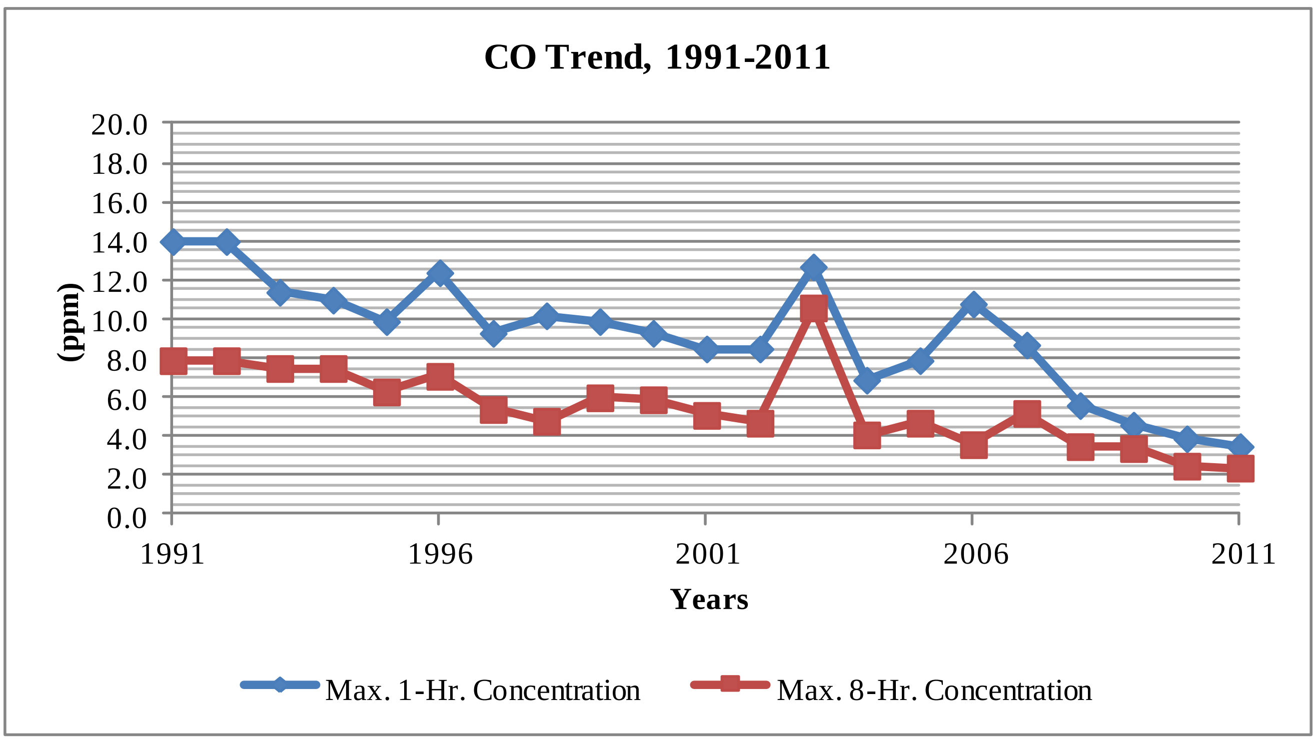
Section 6.3.0 Carbon Monoxide – Trend (Local/County)

The peak 8-Hr indicator for carbon monoxide have steadily decreased over the years in the SDAB (Table 6.4). There has not been an exceedance since 1990. In 2003, the wildfires in the County had a deleterious impact on the SDAB. Specifically, the standards for CO were surpassed, but these exceedances are considered an exceptional event and do not have a lasting impact in the SDAB. Exceptional events are still tallied in the accounting for attainment/non-attainment status. Even with the last two wildfires in 2003 and 2007, the County still qualifies for attainment status. Please note, the "Days Above the Standard" row in Table 6.4 reflect the carbon monoxide standards for that year.

Table 6.4 Carbon Monoxide Summary of Concentrations for the Last 20 Years

CARBON MONOXIDE (ppm)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Max. 1-Hr. Concentration	14.0	14.0	11.4	11.0	9.9	12.4	9.3	10.2	9.9	9.3	8.5	8.5	12.7	6.9	7.9	10.8	8.7	5.6	4.6	3.9	3.5
Max. 8-Hr. Concentration	7.9	7.9	7.5	7.5	6.3	7.1	5.4	4.8	6.0	5.9	5.1	4.7	10.6	4.1	4.7	3.6	5.2	3.5	3.4	2.5	2.4
Days Above Nat.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

Figure 6.2 Carbon Monoxide Concentrations for the Last 20 Years Graph

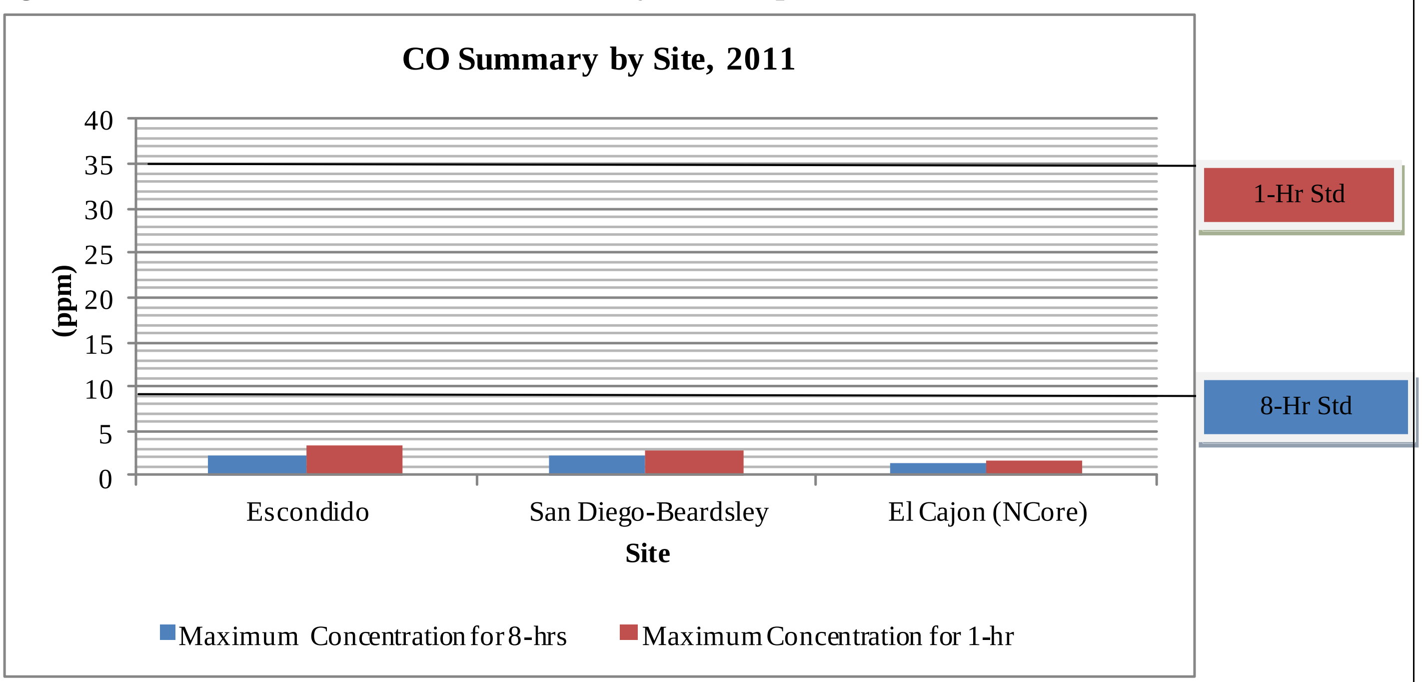


Section 6.4.0 Carbon Monoxide - Measurements by Site

Table 6.5 Carbon Monoxide Measurements by Site

Location (name)	Maximum Concentration for 8-Hrs (ppm)	Number of Days Above the National Standard (#)	Maximum Concentration for 1-Hr (ppm)	Number of Days above the National Standard (#)	Annual Average (ppm)
Escondido	2.3	0	3.5	0	0.5
San Diego-Beardsley	2.4	0	2.8	0	0.5
El Cajon (NCore)	1.3	0	1.8	0	0.4
San Diego Air Basin Overall Average					0.5

Figure 6.3 Carbon Monoxide Measurements by Site Graph



Section 6.5.0 Carbon Monoxide - Design Criteria Requirements from the Code of Federal Regulations

Requirements for the number of monitors for carbon monoxide are in the CFR annual update on July 1 of every year. The 2010 edition of 40 CFR Part 58-"Ambient Air Quality Surveillance", Subpart G-Federal Monitoring, Appendix D, Section 4-"Pollutant-Specific Design Criteria for SLAMS Sites, subsection 4.2 (see italics below). Please note, only the passages applicable to the SDAB have been cited.

4.2 Carbon Monoxide (CO) Design Criteria.
(a) There are no minimum requirements for the number of CO monitoring sites. Continued operation of existing SLAMS CO sites using FRM or FEM is required until discontinuation is approved by the EPA Regional Administrator. Where SLAMS CO monitoring is ongoing, at least one site must be a maximum concentration site for that area under investigation.

Requirements for the number of carbon monoxide monitors for the NCore pollutants are in the July 1, 2010 edition of 40 CFR Part 58-"Ambient Air Quality Surveillance, Subpart G-Federal Monitoring", Appendix D, Section 3 – "Design Criteria for NCore sites" and are referenced in this report (see italics below). Please note, only the passages applicable to the SDAB have been cited.

3. Design Criteria for NCore Sites
(b) The NCore sites must measure, at a minimum, $PM_{2.5}$ particle mass using continuous and integrated/filter-based samplers, speciated $PM_{2.5}$, $PM_{10-2.5}$ particle mass, speciated $PM_{10-2.5}$, O_3, SO_2, CO, NO/NO_y, wind speed, wind direction, relative humidity, and ambient temperature.

Section 6.5.1 Carbon Monoxide - Design Criteria for the SDAB Actual

Monitoring for ambient carbon monoxide is not required in the SDAB. Ambient concentrations for these pollutants do not exceed the NAAQS and do not trigger requirements for monitoring.

Table 6.6a Carbon Monoxide Design Criteria for Minimum Number of Ambient Level (non-NCore) Monitors Needed

MSA (name)	County (name)	Minimum Number of Ambient Monitors Required (#)	Number of Active Ambient Monitors (#)	Number of Ambient Monitors Needed (#)	Met NAAQS 2011 ? (yes/no)
San Diego	San Diego	n/a	2	None	Yes

Table 6.6b Carbon Monoxide Design Criteria for Minimum Number of Trace Level (NCore) Monitors Needed

MSA (name)	County (name)	Minimum Number of NCore Monitors Required (#)	Number of Active NCore Monitors (#)	Number of NCore Monitors Needed (#)	Met NAAQS 2011 ? (yes/no)
San Diego	San Diego	1	1	None	Yes

6.6.0 Carbon Monoxide – Quality Control (QC) Practices for the Network

Requirements for the Quality Control of criteria pollutants are in 40 CFR Part 50 and Part 58 and the QA Handbook, Vol. II. Each criteria pollutant has a specific section. See Table 6.5 for the specific references and equipment.

Table 6.7 Carbon Monoxide QC Measures

	Quality Control Measures		
	Calibration	Zero/Span	Precision Checks
Frequency	Every monitor 1/year and 25% monitors/quarter (QA Handbook Vol. II, CO Calibration; *NCore= 4/yr*	Ambient= Nightly; *NCore Zero= every 2 days* *NCore Span= every 4 days*	Every 2 Weeks; *NCore= every 4 days*
Personnel	Manually performed by personnel who do not perform the audits	Automated	Manually performed by randomly selected personnel; *NCore= Automated*
Reference	40 CFR Part 50, App. C; QA Handbook Vol. II	No greater than Zero drift ≤ ± 0.5% FS Span drift ≤ ± 10%	40 CFR Part 58, App. A, Section 3.2.1 (Table A–2)
Equipment Used (Calibrator)	With Level I Dynamic Dilution Instrumentation used for calibrations & precision checks only; *NCore= Level I specific to that station*	Level II Zero/Spans with a Dynamic Dilution Instrumentation specific to that station; *NCore= Level I specific to that station*	With Level I Dynamic Dilution Instrumentation used for calibrations & precision checks only; *NCore= Level I specific to that station*
Gas Used	40 CFR Part 58 App. A, Section 2.6.1 (EPA Protocol I, ±1%)	Ambient= Blend of gases (±5%); *NCore= EPA Protocol I (±1%)*	40 CFR Part 58 App. A, Section 2.6.1 (EPA Protocol I, ±1%)
Diluent Used (Zero Air Generator)	Zero Air generator used for calibrations & precision checks only; *NCore= specific to that station and used for calibrations, precision checks, and zero/spans*	Zero Air generator specific to that station; *NCore= specific to that station and used for calibrations, precision checks, and zero/spans*	Zero Air generator used for calibrations & precision checks only; *NCore= specific to that station and used for calibrations, precision checks, and zero/spans*
Certifications	Calibrator= 2/yr *Calibrator (NCore)= 4/yr* Zero Air Generator=*	Calibrator (Level II)= n/a *Calibrator (NCore)= 4/yr* Zero Air Generator=*	Calibrator= 2/yr *Calibrator (NCore)= 4/yr* Zero Air Generator=*

*With the LDLs of the newer monitors lower than a cylinder of air, the District is in the process of developing a procedure to test the quality of the delivered air by using a zero air generator.

6.7.0 Carbon Monoxide – Quality Assurance (QA) Practices for the Network

Requirements for Quality Assurance of criteria pollutants are in 40 CFR Part 58. Each criteria pollutant has a specific section. See Table 6.6 for the specific references and equipment.

Table 6.8 Carbon Monoxide QA Measures

	Quality Assurance Measures	
	Internal Local Audits (District)	External State Audits (ARB)
Frequency	Every monitor 1/year and 25% monitors/quarter; *NCore=4/yr*	75% of the monitors/year randomly selected
Personnel	With personnel who do not perform the calibrations	Manually performed by randomly selected personnel
Reference	40 CFR Part 58 App. A, Section 3.2.2	n/a
Equipment used (Calibrator)	With Level I Dynamic Dilution Instrumentation used for audits only	With external Dynamic Dilution Instrumentation
Gas Used	40 CFR Part 58 App. A, Section 2.6.1 (EPA Protocol I, ±1%)	See ARB
Diluent Used	Zero Air Generator used for audits only	External Zero Air Generator
Certifications	Calibrator= 2/yr Zero Air Generator=*	See ARB

*With the LDLs of the newer monitors lower than a cylinder of air, the District is in the process of developing a procedure to test the quality of the delivered air by using a zero air generator.

6.8.0 Carbon Monoxide – Changes to the Network

Official decommissioning of any monitor or monitoring location will be proposed in a letter with accompanying documentation to the EPA and, when appropriate, the ARB. If a station is to relocate, parallel sampling between the current location and the new location will be undertaken, when possible.

6.8.1 Carbon Monoxide – Changes to the Design Criteria Requirements from the Code of Federal Regulations for the Next Year

Carbon monoxide design criteria applicable to calendar year (CY) 2013 have changed; therefore, the information in Section 6.5 will not apply to CY 2013. The requirement for the number of monitors for the criteria pollutants are in the July 1, 2011 edition 40 CFR Part 58-"Ambient Air Quality Surveillance", Subpart G-Federal Monitoring, Appendix D, Section 4-"Pollutant-Specific Design Criteria for SLAMS Sites", subsection 4.2 (see italics below). Please note, only the passages applicable to the SDAB have been cited. The creation of a new near-road (also called roadway) NO_2 monitoring program will require a roadway CO monitor.

> *4.2.1 General Requirements.*
> *(a) Except as provided in subsection (b), one CO monitor is required to operate collocated with one required near-road NO_2 monitor, as required in Section 4.3.2 of this part, in CBSAs having a population of 1,000,000 or more persons. If a CBSA has more than one required near-road NO_2 monitor, only one CO monitor is required to be collocated with a near-road NO2monitor within that CBSA.*

Table 6.9 Carbon Monoxide Design Criteria for the Minimum Number of NO_2 Roadway Collocated Monitors Needed

MSA (name)	County (name)	2011 Population from 2010 Census (#)	Minimum Number of Locations Required	Minimum Number of Monitors Required (#)	Number of Active Monitors (#)	Monitors Needed (#)
San Diego	San Diego	3.2 million	2*	1	0	1

*The District will use a phased approach to the implementation of the near-road sites. After the required NO_2 near-road site is identified, installed, and made operational, an in-depth analysis of the data from this location will be undertaken to determine if the additional near-road location will be necessary.

6.8.2 Carbon Monoxide – Changes to the Equipment

There are no planned equipment changes for CY 2013.

6.8.3 Carbon Monoxide - Changes in Sampling Locations

The only change will be the addition of a CO monitor to the NO_2 roadway location. Please see the Section 5-NO_2 chapter 5.8.1a Nitrogen Dioxide – roadway first location for details.

Section 7.0.0 Sulfur Dioxide (SO_2) Introduction

For the first six months of 2011, sulfur dioxide was sampled on a continuous basis at four locations in the SDAB (Figure 7.1) and referenced to the Standards of 2011 (Table 7.1). The sampling equipment are listed in Tables 7.2 and 7.3. Trace level SO_2 was sampled at the El Cajon-NCore site. *For NCore details, Please see section 11 – NCore for detailed requirements.*

Figure 7.1 Sulfur Dioxide Network Map

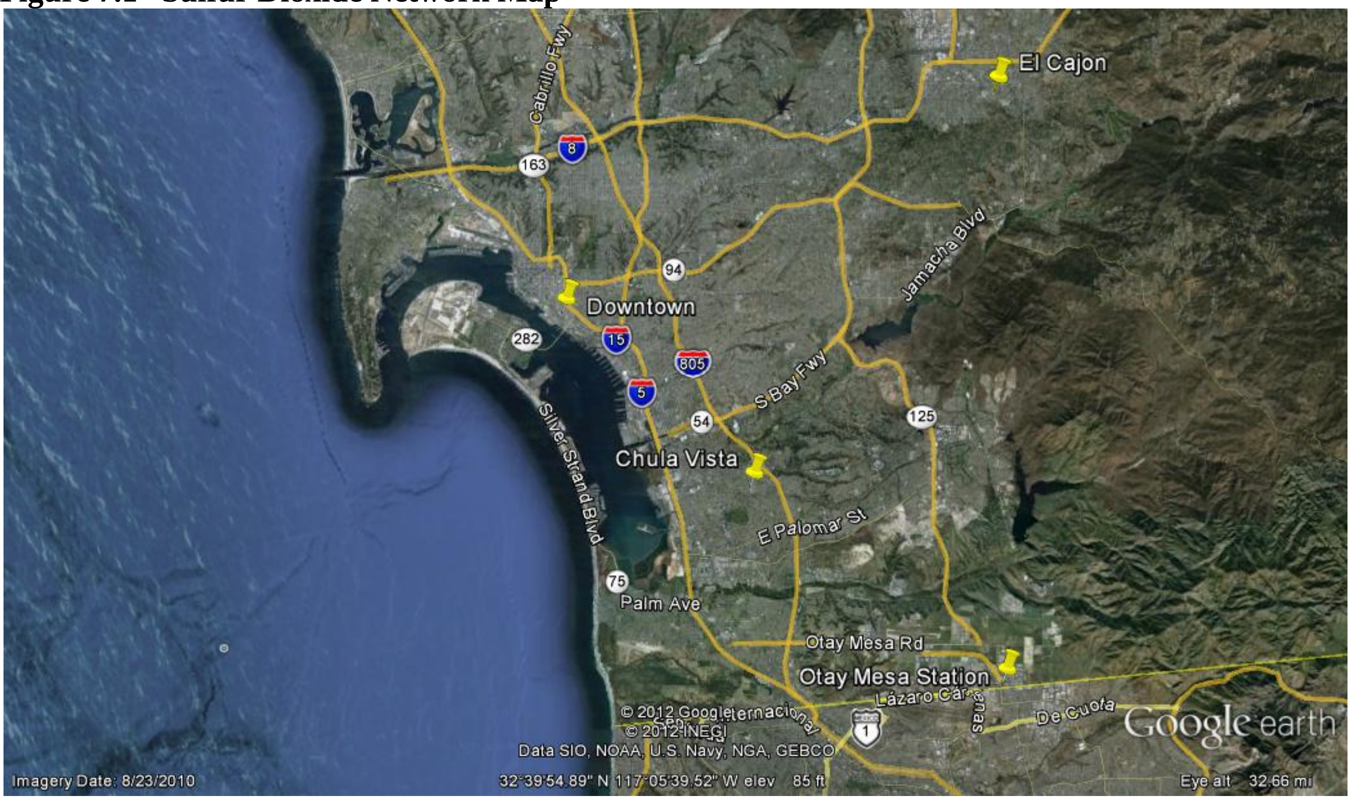


Table 7.1 Sulfur Dioxide State and Federal Standards for the Year

Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards		National Standards		
		Concentration	Method	Primary	Secondary	Method
Sulfur Dioxide (SO_2)[9]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[9]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[9]	—	

Table 7.2 Sulfur Dioxide Sampling Network

Abbreviation		CVA	OTM	DTN	ECA
Name		Chula Vista	Otay Mesa-Border Xing	San Diego-Beardsley	El Cajon
Address		80 E. J St.	1100B Paseo International	1110A Beardsley St.	1155 Redwood
Latitude Longitude		32° 37' 52" N 117° 03' 33" W	32° 33' 08" N 116° 56' 16" W	32° 42' 05" N 117° 08' 59" W	32° 47' 28" N 116° 56' 32" W
AIRS ID		06 073 0001	06 073 2007	06 073 1010	06 073 0003
SO_2	Monitor Designation	SLAMS	SLAMS	SLAMS	NCore
	Sampling Method	FL	FL	FL	FL
	Spatial Scale	NS	NS	NS	NS
	Monitoring Objective (Federal)	RC	RC	RC	RC
	Monitoring Objective (Local)	Trends	Trends	Trends	
	Analysis By	SDAPCD	SDAPCD	SDAPCD	SDAPCD
	Sampling Frequency	7 / 24	7 / 24	7 / 24	7 / 24
	Equipment Manufacturer/Mode	Thermo 43A	Thermo 43C	Thermo 43A	Thermo 43i - T.L.E.

GLOSSARY OF TERMS

Monitor Designation

- PAMS Photochemical Assessment Monitoring
- SLAMS State and Local Air Monitoring Stations
- SPM Special Purpose Monitoring
- NCore National Core
- QA Quality Assurance collocated
- CSN Chemical Speciation Network
- STN Speciation Trends Network
- CSM Community Scale Monitoring (SDAPCD)
- CA TAC California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

- CL Chemiluminescence
- CT Low volume, continuous sampler, size selective inlet
- 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
- IPMS Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale

- MI Micro Scale
- MS Middle 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

Section 7.1.0 Sulfur Dioxide – Sampling Frequency

Requirements for the sampling frequency of SLAMS monitors, including NCore, for pollutants are in July 1, 2010 edition of the 40 CFR Part 58-"Ambient Air Quality Surveillance", section 58.12-"Operating Schedules". The sampling frequency for sulfur dioxide monitors are 7 days a week/ 4 hours a day (7/24). They sample continually with no media changes needed.

Section 7.2.0 Sulfur Dioxide Sampling Equipment

Table 7.3 Sulfur Dioxide Sampling Equipment

Pollutant	Abbrev.	Sampler	FRM or FEM Method	Analytical Method	Reported Data Interval	Parameter Code	Method Code
Sulfur Dioxide	SO_2	Thermo 43A&C	Yes	Fluorescence	1 Hour	42401	060
Sulfur Dioxide	SO_2	Thermo 43-T.L.E.	Yes	Fluorescence	1 Hour	42401	560

Section 7.3.0 Sulfur Dioxide Trend (Local/County)

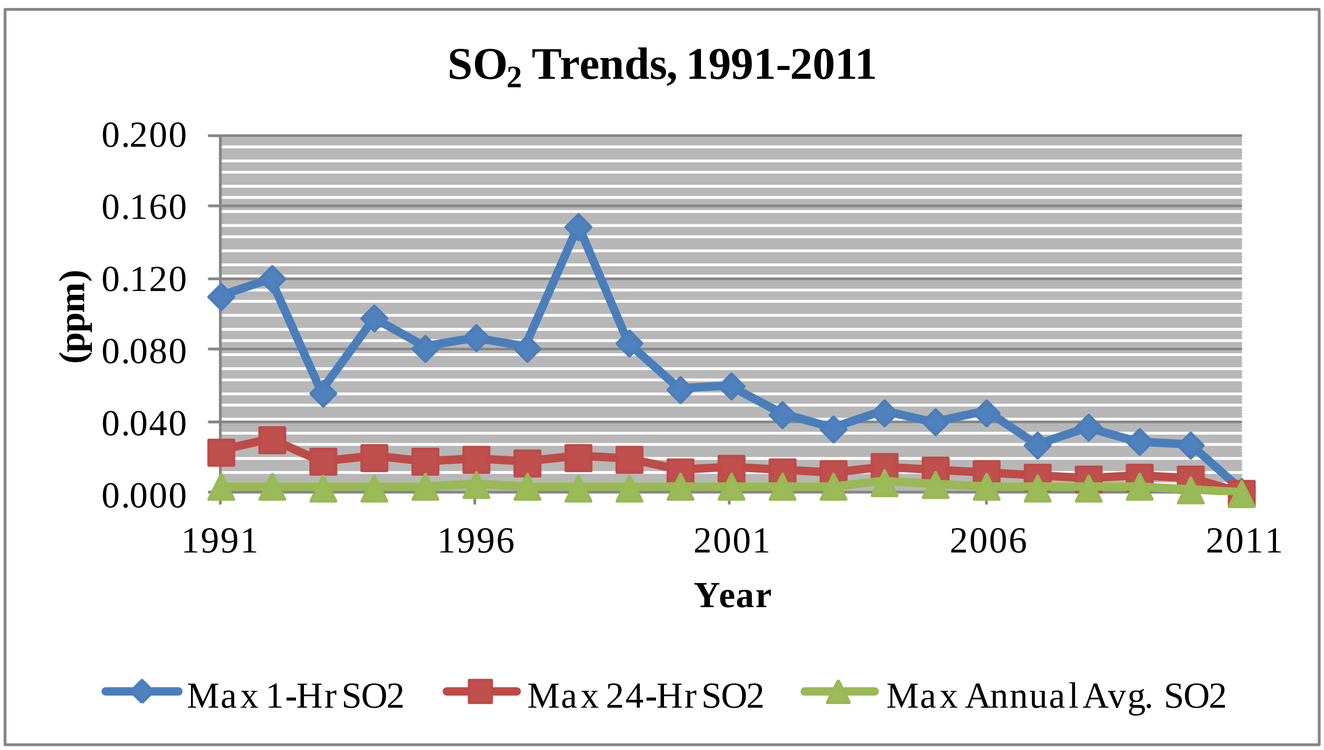
Oxides of Sulfur (SOx) are a group of compounds containing sulfur and oxygen. A major constituent of SOx is sulfur dioxide (SO_2). Emissions of SOx declined tremendously in California over the last 20 years. Sulfur dioxide emissions from stationary sources decreased in the same timeframe due to improved industrial source controls and switching from fuel oil to natural gas for electric generation and industrial boilers. The SOx emissions from land-based on- and off-road gasoline and diesel-fueled engines and vehicles have also decreased due to lower sulfur content in the fuels. Please note, the “Days Above Nat.” row in Table 7.4 reflects the sulfur dioxide standard for that year.

Table 7.4 Sulfur Dioxide Summary of Concentrations for the Last 20 Years

SULFUR DIOXIDE (ppm)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011*
Max 1-Hr SO_2	0.110	0.120	0.056	0.098	0.081	0.087	0.081	0.149	0.084	0.058	0.060	0.044	0.036	0.045	0.040	0.045	0.027	0.037	0.029	0.027	0.001
Max 24-Hr SO_2	0.023	0.030	0.018	0.020	0.018	0.019	0.017	0.020	0.019	0.012	0.014	0.012	0.011	0.015	0.013	0.011	0.009	0.008	0.009	0.008	0.000
Max Annual Avg. SO_2	0.004	0.004	0.003	0.003	0.004	0.005	0.004	0.003	0.003	0.004	0.004	0.004	0.004	0.006	0.005	0.004	0.003	0.003	0.004	0.002	0.000
Days Above Nat.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*The 2011 yearly summary was derived from the El Cajon-NCore trace level SO_2 monitor, since the ambient level monitors at other sites were decomissioned on June 30, 2011.

Figure 7.2 Sulfur Dioxide Concentrations for the Last 20 Years Graph*



*The 2011 yearly summary was derived from the El Cajon-NCore trace level SO_2 monitor, becasue the ambient level monitors were decomissioned on June 30, 2011.

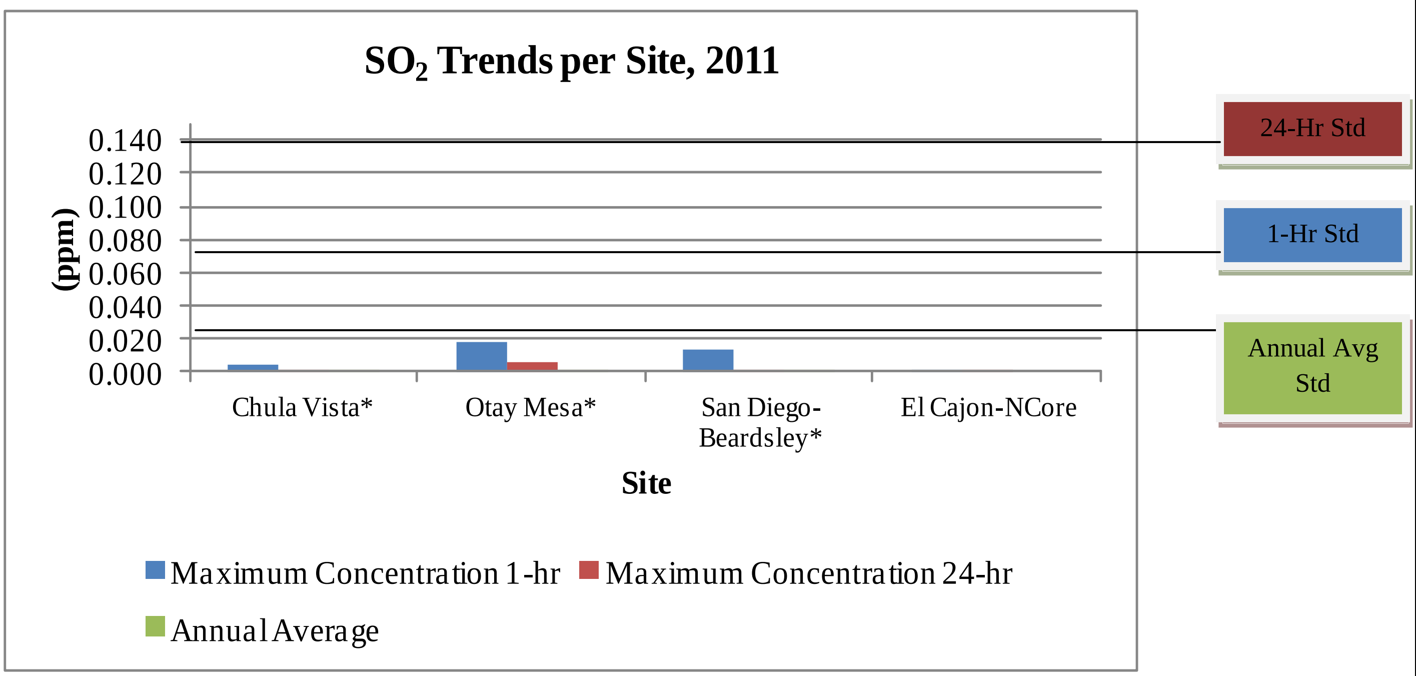
Section 7.4.0 Sulfur Dioxide Measurements by Site

Table 7.5 Sulfur Dioxide Measurements by Site

Location (site)	Maximum Concentration 1-hr (ppm)	Maximum Concentration 24-hr (ppm)	Number of Days Above the National Standard (#)	Annual Average (ppm)
Chula Vista*	0.004	0.001	0	0.001
Otay Mesa*	0.018	0.006	0	0.002
San Diego-Beardsley*	0.013	0.002	0	0.001
El Cajon-NCore	0.001	0.001	0	0.001
San Diego Air Basin Overall Average				0.000

*The summaries for these sites are based on a 6 month average, because they were decomissioned on June 30, 2011.

Figure 7.3 Sulfur Dioxide Measurements by Site Graph



*The summaries for these sites are based on a 6 month average, because the sites were decomissioned on June 30, 2011.

Section 7.5.0 Sulfur Dioxide Design Criteria Requirements from the Code of Federal Regulations

Requirements for the number of monitors for criteria pollutants are in the July 1, 2010 edition of 40 CFR Part 58, "Air Quality Surveillance", Subpart G-Federal Monitoring, Appendix D, Section 4-Pollutant-"Specific Design Criteria for SLAMS Sites. Please note, only the passages applicable to the SDAB have been cited. Requirements for sulfur dioxide are in subsection 4.4 and are referenced in this report, see italics below.

4.4.2 Requirement for Monitoring by the Population Weighted Emissions Index.
(a) The population weighted emissions index (PWEI) shall be calculated by States for each core based statistical area (CBSA) they contain or share with another State or States for use in the implementation of or adjustment to the SO_2 *monitoring network. The PWEI shall be calculated by multiplying the population of each CBSA, using the most current census data or estimates, and the total amount of* SO_2 *in tons per year emitted within the CBSA area, using an aggregate of the most recent county level emissions data available in the National Emissions Inventory for each county in each CBSA. The resulting product shall be divided by one million, providing a PWEI value, the units of which are million persons-tons per year. For any CBSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three* SO_2 *monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two* SO_2 *monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one* SO_2 *monitor is required within that CBSA.*

Requirements for numbers of NCore SO_2 monitors for the criteria pollutants are in the July 1, 2010 edition of the 40 CFR Part 58-"Ambient Air Quality Surveillance, Subpart G-Federal Monitoring", Appendix D, Section 3 – "Design Criteria for NCore sites" and are referenced in this report (see italics below). Please note, only the passages applicable to the SDAB have been cited.

3. Design Criteria for NCore Sites
(b) The NCore sites must measure, at a minimum, $PM_{2.5}$ *particle mass using continuous and integrated/filter-based samplers, speciated* $PM_{2.5}$, $PM_{10–2.5}$ *particle mass, speciated* $PM_{10–2.5}$, O_3, SO_2, *CO,* NO/NO_y, *wind speed, wind direction, relative humidity, and ambient temperature.*

Section 7.5.1 Sulfur Dioxide Design Criteria for the SDAB Actual

According to the latest EPA inventory, the SDAB is listed as having SO_2 emissions of 1,091.4530 Tons/yr. The population of San Diego County ,based with respect to 2011, is 3.2 million persons.
(EPA hyperlink http://neibrowser.epa.gov/eis-public-web/geo/summary.html?jurisdictionId=335,)

Using the PWEI equation, from paragraph 4.4.2 (see above):
{ (3,200,000 million persons) x (1,091 tons/year of SO_2) } / (1,000,000) = 3,493 million persons-Tons/yr

Using the bolded passage from paragraph 4.4.2 (see above), the SDAPCD is not required to have any ambient level SO_2 monitors in the SDAB, Table 7.3a.

Table 7.6a Sulfur Dioxide Design Criteria for the Minimum Number of Ambient Level (non-NCore) Monitors Needed

MSA (name)	County (name)	2011 Population from 2010 Census (#)	Total SO_2 Emissions (TPY)	Population Weighted Emissions Index (PWEI)	Minimum Number of Ambient Monitors Required (#)	Number of Active Ambient Monitors (#)	Number of Ambient Monitors Needed (#)	Meet NAAQS 2011? (yes/no)
San Diego	San Diego	3.2 million	1,091	3,493	0	3*	None	n/a

*The discontinuation of the last three ambient SO_2 monitors on June 30, 2011 was approved by the Regional EPA authority. The only active SO_2 monitor is the NCore T.L.E (NCore) analyzer.

Table 7.6b Sulfur Dioxide Design Criteria for the Minimum Number of Trace Level (NCore) Monitors Needed

MSA	County	Minimum Number of NCore Monitors Required (#)	Number of Active NCore Monitors (#)	NCore Monitors Needed (#)	Met NAAQS 2011 ? (yes/no)
San Diego	San Diego	1	1	None	Yes

7.6.0 Sulfur Dioxide – Quality Control (QC) Practices for the Network

Requirements for Quality Control of criteria pollutants are in 40 CFR Part 50 and Part 58 and the QA Handbook, Vol. II. Each criteria pollutant has a specific section. See Table 7.4 for the specific references and equipment.

Table 7.7 Sulfur Dioxide QC Measures

	Quality Control Measures		
	Calibration	Zero/Span	Precision Checks
Frequency	Every monitor 1/year and 25% monitors/quarter (QA Handbook Vol. II, App. D, SO_2 Calibration); *NCore= 4/yr*	Nightly; *NCore Zero= every 2 days* *NCore Span= every 4 days*	Every 2 Weeks; *NCore= Every 4 days*
Personnel	Manually performed by personnel who do not administer the audits	Automated	Manually performed by randomly selected personnel; NCore= automated
Reference	40 CFR Part 50, App. A, QA Handbook Vol. II	No greater than Zero drift ≤ ± 0.5% FS Span drift ≤ ± 10%	40 CFR Part 58, App. A, Section 3.2.1 (Table A–2)
Equipment used (Calibrator)	With Level I Dynamic Dilution Instrumentation used for calibrations & precision checks only; *NCore= Level I specific to that station*	Level II Zero/Spans with a Dynamic Dilution Instrumentation specific to that station; *NCore= Level I specific to that station*	With Level I Dynamic Dilution Instrumentation used for calibrations & precision checks only; *NCore= Level I specific to that station*
Gas Used	40 CFR Part 58 App. A, Section 2.6.1 (EPA Protocol I, ±1%)	Ambient= Blend of gases (±5%); *NCore= Protocol I (±1%)*	40 CFR Part 58 App. A, Section 2.6.1 (EPA Protocol I, ±1%)
Diluent Used	Zero Air Generator used for calibrations & precision checks only; *NCore= specific to that station and used for calibrations, precision checks & zero/spans*	Zero Air Generator specific to that station; *NCore= specific to that station and used for calibrations, precision checks & zero/spans*	Zero Air Generator used for calibrations & precision checks only; *NCore= specific to that station and used for calibrations, precision checks & zero/spans*
Certifications	Calibrator= 2/yr *Calibrator (NCore)= 4/yr* Zero Air Generator=*	Calibrator (Level II)= n/a *Calibrator (NCore)= 4/yr* Zero Air Generator=*	Calibrator= 2/yr *Calibrator (NCore)= 4/yr* Zero Air Generator=*

*With the LDLs of the newer monitors lower than a cylinder of air, the District is in the process of developing a procedure to test the quality of the delivered air by using a zero air generator.

7.7.0 Sulfur Dioxide – Quality Assurance (QA) Practices for the Network

Requirements for Quality Assurance of criteria pollutants are in 40 CFR Part 58. Each criteria pollutant has a specific section. See Table 7.5 for the specific references and equipment.

Table 7.8 Sulfur Dioxide QA Measures

	Quality Assurance Measures	
	Internal Local Audits (District)	External State Audits (ARB)
Frequency	Every monitor 1/year and 25% monitors/quarter; *NCore= 4/yr*	75% of the monitors/year randomly selected
Personnel	With personnel who do not administer the calibrations	Manually performed by randomly selected personnel
Reference	40 CFR Part 58 App. A, Section 3.2.2	n/a
Equipment Used (Calibrator)	With Level I Dynamic Dilution Instrumentation used for audits only	With external Dynamic Dilution Instrumentation
Gas Used	40 CFR Part 58 App. A, Section 2.6.1 (EPA Protocol I, ±1%)	See ARB
Diluent Used	Zero Air Generator used for audits only	External Zero Air Generator
Certifications	Calibrator= 2/yr Zero Air Generator=*	See ARB

*With the LDLs of the newer monitors lower than a cylinder of air, the District is in the process of developing a procedure to test the quality of the delivered air by using a zero air generator.

7.8.0 Sulfur Dioxide – Changes to the Network

Any official decommissioning of any monitor or monitoring location will be proposed in a letter with accompanying documentation to the EPA and, when appropriate, the ARB. If a station is to relocate, parallel sampling between the current location and the new location will be undertaken, when possible.

7.8.1 Sulfur Dioxide – Changes to Design Criteria Requirements from the Code of Federal Regulations for the Next Year

The sulfur dioxide design criteria applicable to calendar year (CY) 2013 have not changed, so the information in Section 7.5.0 will apply to CY 2013.

7.8.2 Sulfur Dioxide – Changes to the Equipment

None.

7.8.3 Sulfur Dioxide – Changes in Sampling Locations

None

Section 8.0.0 Lead (Pb) Introduction

Starting in the 4th quarter of 2011, lead was sampled at the El Cajon location for the National Core (NCore) program (Figure 8.1, yellow stickpin) and referenced to the Standards of 2011 (Table 8.1). The sampling equipment are listed in Tables 8.2 and 8.3. Three temporary special purpose monitors samplers were placed at two airport locations, Gillespie Field and Palomar Airport, by the end of 2011 (Figure 8.1, red stickpins), but sampling did not commence until the 1st quarter of 2012.

Figure 8.1 Lead Map Network Map

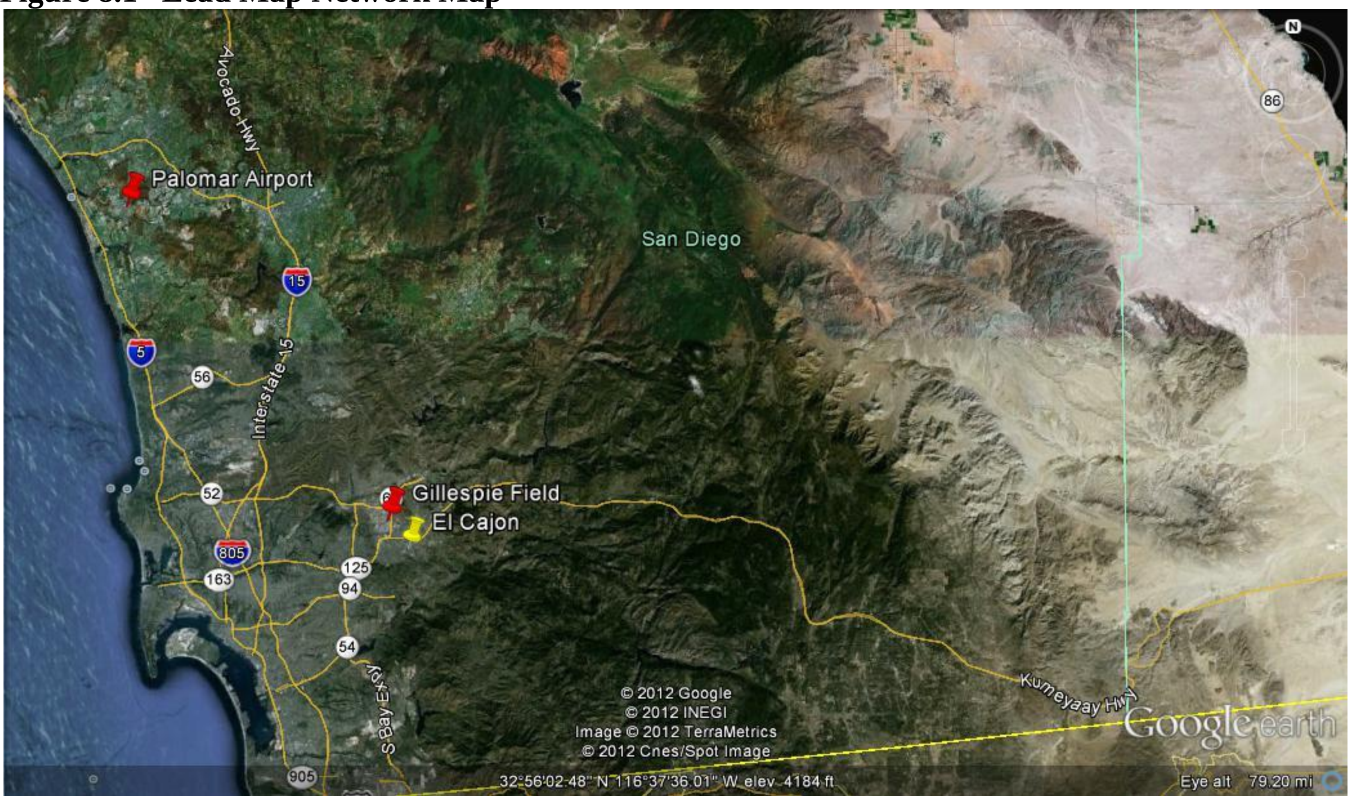


Table 8.1 Lead State and Federal Standards for the Year

Ambient Air Quality Standards						
Pollutant	**Averaging Time**	**California Standards**		**Federal Standards**		
		Concentration	**Method**	**Primary**	**Secondary**	**Method**
Lead	30 Day Average	1.5 μg/m³	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 μg/m³	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average[11]	—		0.15 μg/m³		

AIR POLLUTION CONTROL DISTRICT
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Table 8.2 Lead Sampling Network

	Abbreviation	ECA	*SEE	*CRQ
	Name	El Cajon	Gillespie Field	**Palomar Airport**
	Address	1155 Redwood Ave.	1960 Joe Crosson Drive	**2192 Palomar Airport Road**
	Latitude	32° 47' 28" N	32°49'29.95"N	**33° 7'42.75"N**
	Longitude	116° 56' 32" W	116°57'45.27"W	**117°16'17.90"W**
	AIRS ID	06 073 0003	06 073 1021	**06 073 1020**
Pb-TSP	Monitor Designation	SLAMS, NCore	SLAMS	**SLAMS**
	Sampling Method	IPMS	IPMS	**IPMS**
	Spatial Scale	NS	MI	**MI**
	Monitoring Objective (Federal)	RC	IM	**IM**
	Monitoring Objective (Local)			
	Analysis By	SDAPCD	SDAPCD	**SDAPCD**
	Sampling Frequency	1:6	1:6	**1:6**
	Equipment Manufacturer/Mode	Tisch TE-5170BLVFC+	Tisch TE-5170BLVFC+	**Tisch TE-5170BLVFC+**

GLOSSARY OF TERMS

Monitor Designation

PAMS	Photochemical Assessment Monitoring
SLAMS	State and Local Air Monitoring Stations
SPM	Special Purpose Monitoring
NCore	National Core
QA	Quality Assurance collocated
CSN	Chemical Speciation Network
STN	Speciation Trends Network
CSM	Community Scale Monitoring (SDAPCD)
CA TAC	California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

CL	Chemiluminescence
CT	Low volume, continuous sampler, size selective inlet
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
IPMS	Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale

MI	Micro Scale
MS	Middle 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

Bold & Yellowed areas indicate a collocation of samplers to satisfy Federal QA requirements.

* The Lead sampling locations at the airports were constructed in the 4th Quarter of 2011, but official sampling did not begin until the 1st Quarter of 2012.

Section 8.1.0 Lead - Sampling Frequency

The requirement for the sampling frequency of monitors for pollutants are in the July 1, 2010 edition of 40 CFR Part 58-Ambient Air Quality Surveillance, Subpart B "monitoring Network", Section 58.12-Operating schedules. The sampling frequency for the Lead-TSP monitors are one day in six (1:6).

Section 8.2.0 Lead - Sampling Equipment

Table 8.3 Lead Sampling Equipment

Pollutant	Abbrev	Sampler	FRM or FEM Method	Reported Data Interval	Parameter Code	Method Code
Lead	Pb	Tisch TE-5170BLVFC+	Yes	24 Hour	14129	192

Section 8.3.0 Lead - Trend (Local/County)

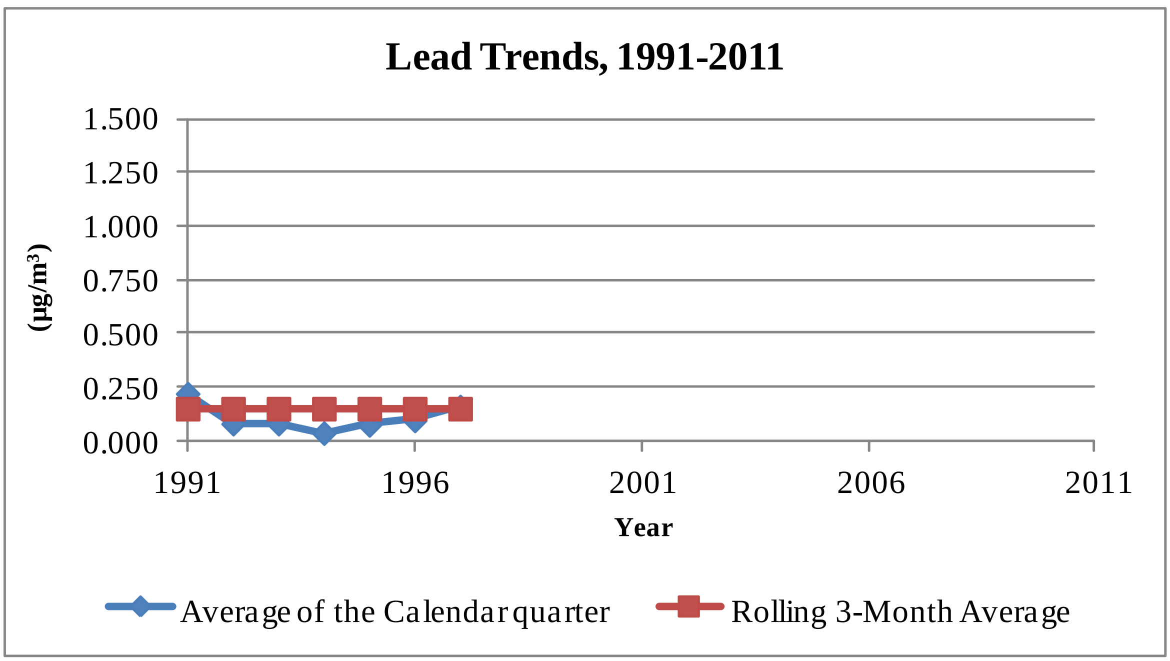
The rapid decrease in lead emissions (Table 8.2) over the last 20 plus years can be attributed primarily to phasing out the lead in gasoline by the EPA and the ARB. This phase-out began during the 1970s, and subsequent regulations have eliminated all lead from the gasoline now sold in California for automotive vehicles. Please note, the "Days Above Nat." row in Table 8.2 reflect the lead standard for that year.

Table 8.4 Lead Summary of Concentrations for the Last 20 Years

LEAD (µg/m^3)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Average of the Calendar quarter (µg/m^3)	0.220	0.080	0.080	0.036	0.074	0.095	0.160	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*
Rolling 3-Month Average (µg/m^3)	0.150	0.150	0.150	0.150	0.150	0.150	0.150	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*
Days Above Nat.	0	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*

* The Lead sampling locations at the airports were constructed in the 4th Quarter of 2011, but due to power delivery problems, official sampling did not begin until the 1st Quarter of 2012.

Figure 8.2 Lead Concentrations for the Last 20 Years Graph*



*The Lead sampler at the El Cajon location was not operational for a full year, so no yearly summary can be compiled.

Section 8.4.0 Lead - Measurements by Site

* The Lead sampling locations at the airports were constructed in the 4th Quarter of 2011, but official sampling did not begin until the 1st Quarter of 2012.

Section 8.5.0 Lead Design Criteria Requirements from the Code of Federal Regulations

Requirements for the number of Pb monitors are in the July 1, 2010 edition of 40 CFR Part 58, "Air Quality Surveillance", Subpart G-Federal Monitoring, Appendix D, Section 4-Pollutant-"Specific Design Criteria for SLAMS Sites", subsection 4.5 and are referenced (see italics below). Please note, only the passages applicable to the SDAB have been cited. The Design Criteria Value is based on placing the monitor(s) at the suspected maximum concentrations site(s) and measured on a rolling 3-month average with respect to the NAAQS.

4.5 Lead (Pb) Design Criteria.
(a) State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near Pb sources which are expected to or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS, taking into account the logistics and potential for population exposure. At a minimum, there must be one source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year based on either the most recent National Emission Inventory (http://www.epa.gov/ttn/chief/eiinformation.html) or other scientifically justifiable methods and data (such as improved emissions factors or site-specific data) taking into account logistics and the potential for population exposure.

(i) One monitor may be used to meet the requirement in paragraph 4.5(a) for all sources involved when the location of the maximum Pb concentration due to one Pb source is expected to also be impacted by Pb emissions from a nearby source (or multiple sources). This monitor must be sited, taking into account logistics and the potential for population exposure, where the Pb concentration from all sources combined is expected to be at its maximum.

(ii) The Regional Administrator may waive the requirement in paragraph 4.5(a) for monitoring near Pb sources if the State or, where appropriate, local agency can demonstrate the Pb source will not contribute to a maximum Pb concentration in ambient air in excess of 50 percent of the NAAQS (based on historical monitoring data, modeling, or other means). The waiver must be renewed once every 5 years as part of the network assessment required under §58.10(d).

(iii) State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near each of the airports listed in Table D–3A for a period of 12 consecutive months commencing no later than December 27, 2011. Monitors shall be sited to measure the maximum Pb concentration in ambient air, taking into account logistics and the potential for population exposure, and shall use an approved Pb-TSP Federal Reference Method or Federal Equivalent Method. Any monitor that exceeds 50 percent of the Pb NAAQS on a rolling 3-month average (as determined according to 40 CFR part 50, Appendix R) shall become a required monitor under paragraph 4.5(c) of this Appendix, and shall continue to monitor for Pb unless a waiver is granted allowing it to stop operating as allowed by the provisions in paragraph 4.5(a)(ii) of this appendix. Data collected shall be submitted to the Air Quality System database according to the requirements of 40 CFR part 58.16.

Table D–3A Airports To Be Monitored for Lead

Airport	***County***	***State***
McClellan-Palomar	*San Diego*	*CA*
Gillespie Field	*San Diego*	*CA*

(b) State and, where appropriate, local agencies are required to conduct non-source-oriented Pb monitoring at each NCore site required under paragraph 3 of this appendix in a CBSA with a population of 500,000 or more.

(c) The EPA Regional Administrator may require additional monitoring beyond the minimum monitoring requirements contained in paragraphs 4.5(a) and 4.5(b) where the likelihood of Pb air quality violations is significant or where the emissions density, topography, or population locations are complex and varied. EPA Regional Administrators may require additional monitoring at locations including, but not limited to, those near existing additional industrial sources of Pb, recently closed industrial sources of Pb, airports where piston-engine aircraft emit Pb, and other sources of re-entrained Pb dust.

Requirements for the number of Pb monitors are in the July 1, 2010 edition of 40 CFR Part 58-Ambient Air Quality Surveillance, Subpart G-Federal Monitoring, Appendix D, Section 3 – Design Criteria for NCore sites and is referenced in this report (see italics below). Please note, only the passages applicable to the SDAB have been cited.

3. Design Criteria for NCore Sites
(b) NCore sites in CBSA with a population of 500,000 people (as determined in the latest Census) or greater shall also measure Pb either as Pb-TSP or Pb-PM_{10}. The EPA Regional Administrator may approve an alternative location for the Pb measurement where the alternative location would be more appropriate for logistical reasons and the measurement would provide data on typical Pb concentrations in the CBSA.

Section 8.5.1 Lead Design Criteria for the SDAB Actual

Table 8.5a Lead Design Criteria for the Minimum Number of Ambient Level, non-NCore, and non-Airport Monitors Needed

MSA (name)	County (name)	Any Pb Source > 0.5 TPY? (yes/no)	Minimum Number of Ambient Monitors Required	Number of Active Ambient Monitors (#)	Number of Ambient Monitors Needed (#)	Meet NAAQS 2011? (yes/no)
San Diego	San Diego	No	0	0	None	n/a

Table 8.5b Lead Design Criteria for the Minimum Number of NCore Monitors Needed

MSA (name)	County (name)	2011 Population from 2010 Census (#)	Minimum Number of NCore Monitors Required (#)	Number of Active NCore Monitors (#)	Number of NCore Monitors Needed (#)	NCore Site (name)	NCore Site AQS ID Number (#)	Meet NAAQS 2011? (yes/no)
San Diego	San Diego	3.2 million	1	1	None	El Cajon	06-073-0003	*n/a

*The Lead samplers at the locations were in place, but not operational in 2011

Table 8.5c1 Lead Design Criteria for the Minimum Number of Airport Monitors Needed

Minimum Number of Airport Monitors Required (#)	Number of Active Airport Monitors (#)	Number of Airport Monitors Needed (#)	Airport Monitor Sites (name)	Airport Sites AQS ID Numbers (#)	Airport Sites Addresses
2	2	None	Gillespie Field McClellan-Palomar	06-073-1021 06-073-1020	1960 Joe Crosson Dr. 2192 Palomar Airport Rd.

Table 8.5c2 Lead Design Criteria Emission Summaries for the Airport Monitors

Source Sites (name)	Lead Emissions (2011) (TPY)	Emission Inventory Source & Data Year (#)	Maximum 3-Month Design Value ($\mu g/m^3$)	Design Value Date (3^{rd} month, year)
Gillespie Field McClellan-Palomar	*	*	0	0

*The Lead samplers were not operational in 2011.

Section 8.6.0 Lead – Quality Control (QC) Practices for the Network

Requirements for the Quality Control of the criteria pollutants are in 40 CFR Part 50 and Part 58. Each criteria pollutant has a specific section. See Table 8.4a & b for the specific references and equipment. The District utilizes a TSP transfer standard that is certified annually by the CARB laboratory. This transfer standard is used to calibrate the Hi-Vol TSP samplers in the network.

Table 8.6a Lead QC Measures

	Quality Control Measures (Field)	
	Calibration	Flow Rate Verification
Frequency	NCore-twice a year,* *Airports-4/yr***	Every 4 Weeks
Personnel	By personnel who do not perform the audits	By site operator
Reference (Field)	Method 2.2, Section 2.6	40 CFR Part 58, App. A, Sections 2.6
Equipment Used (Calibrator)	With Variable Flow Rate instrumentation, thermocouple, manometer, and barometric pressure sensor used for calibrations only	With Variable Flow Rate instrumentation, thermocouple, manometer, and barometric pressure sensor used for verifications only
Certifications	Field Equipment = 1/yr	Field Equipment = 1/yr

*This is twice the required frequency.

**Due to the short duration of the program, the calibration frequency was increased to four times the required frequency.

Table 8.6b Lead QC Measures for the Laboratory

Quality Control Measures (Laboratory)		
Equipment	Reference	Frequency
Reagents	40 CFR Part 50, App. G; EPA Method EQL-0710-192	All reagents
Filters	40 CFR Part 50, App. B, Section 8.2; 40 CFR Part 50, App. G, Section 6.1	All filters

Section 8.7.0 Lead – Quality Assurance (QA) Practices for the Network

Requirements for Quality Assurance of criteria pollutants are in the 40 CFR Part 58. Each criteria pollutant has a specific section. See Table 9.8 for the specific references and equipment.

Table 8.7a Lead QA Measures

	Quality Assurance Measures (Field)			
	Internal Local (District) Audits	Collocation	External State (ARB) Audits	External Federal (PEP) Audits
Frequency	NCore- 2/yr* *Airports-4/yr***	Same frequency and time as the primary sampler	NCore= 1/yr *Airports= n/*a	NCore= 1/yr *Airport= 1/yr*
Personnel	With personnel who do not perform the calibrations	With personnel who do not perform the calibrations	Manually performed by randomly selected personnel	Manually performed by randomly selected personnel
Reference (Field)	40 CFR Part 58 App. A, Section 3.2.4	NCore= Assigned by EPA Airports= Max Site	n/a	40 CFR Part 58 App. A, Section 3.3.4.4
Equipment Used (Field)	With Flow Transfer Standard and Thermocouple used for audits only	Same equipment as the primary sampler	See ARB	See EPA
Certifications	Field Equipment = 1/yr	Field Equipment = 1/yr	See ARB	See EPA

*This is twice the required frequency.

*Due to the short duration of the program, the calibration frequency was increased to four times the required frequency.

Table 8.7b Lead QA Measures for the Laboratory

Quality Assurance Measures (Laboratory)		
Equipment	Reference	Frequency
Lead Strip Analysis	40 CFR Part 58 App. A, Section 3.3.4.2	Quarterly
Lead Strip Analysis-additional	Internal	1/batch analysis

Section 8.7.1 Lead Quality Assurance (QA) Collocation Requirements for the Network

NCore

The NCore Pb-TSP sampler is part of the national NCore program and collocation samplers are aligned according to EPA Regional placement. The SDAB was not a collocation designee, so collocation for Pb-NCore is not required in the SDAB.

Airports

Table 8.8 Lead Quality Assurance Collocation Requirements for the Network

Main Monitor			Collocated Monitor		
Minimum Number of Monitors Required (#)	Number of Active Monitors (#)	Monitors Needed (#)	Number of Monitors Needed for Collocation (#)	Number of Active Monitors used for Collocation (#)	Monitors Needed (#)
2	2	None	1	1	None

Section 8.8.0 Lead – Changes to the Network

Any official decommissioning of any monitor or monitoring location will be proposed in a letter with accompanying documentation to the EPA and, when appropriate, the ARB. If a station is to relocate, parallel sampling between the current location and the new location will be undertaken, when possible.

Section 8.8.1 Lead – Changes to the Design Criteria Requirements from the Code of Federal Regulations

The Lead design criteria applicable to calendar year (CY) 2012 have not changed, so the information in Section 8.5.0 will apply to CY 2013.

Section 8.8.2 Lead – Changes to the Equipment

None

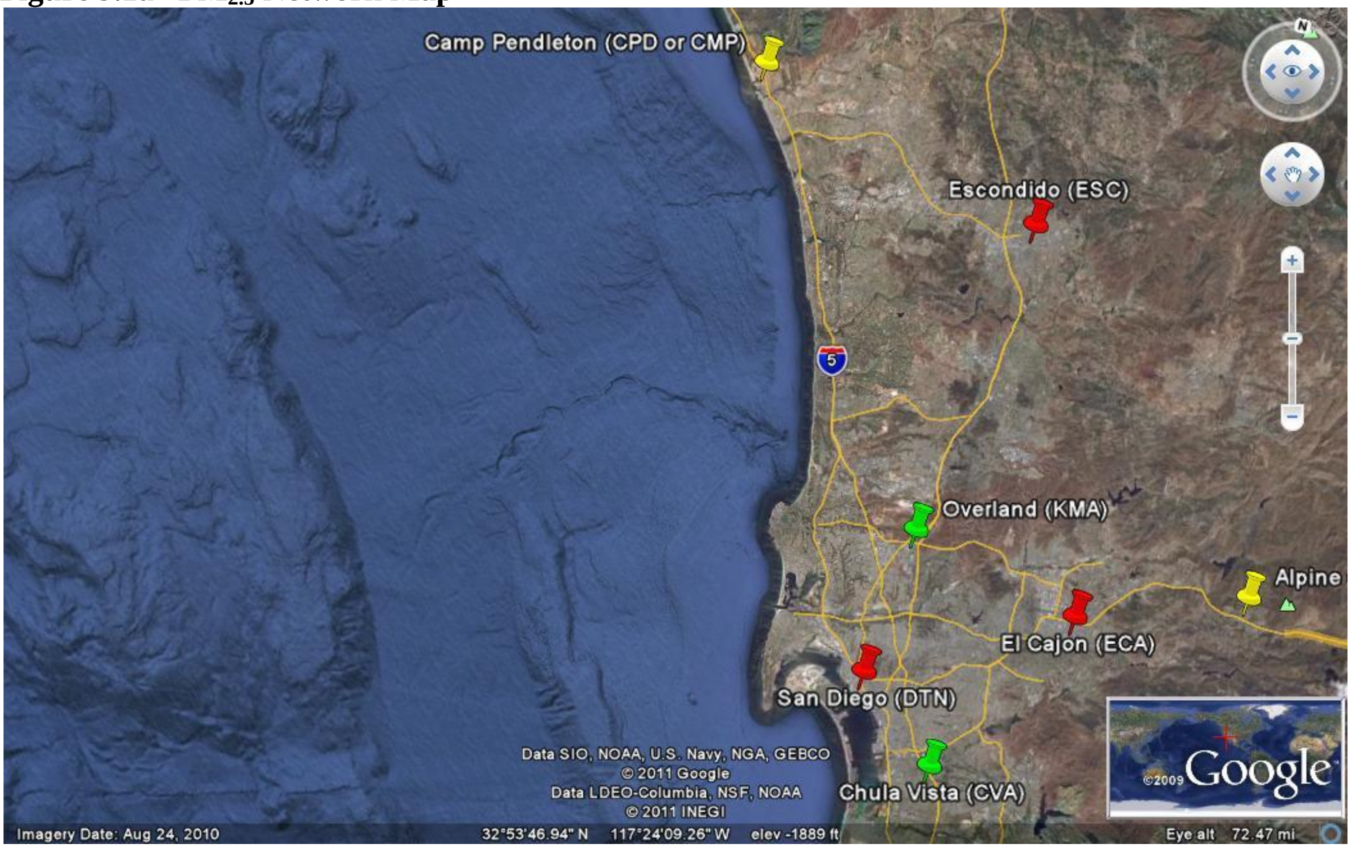
Section 8.8.2 Lead – Changes to the Sampling Locations

None

Section 9.0.0 Particulate Matter 2.5 µm ($PM_{2.5}$) Introduction

For 2011, $PM_{2.5}$ was sampled on both a continuous basis and sequentially (on a schedule set by the EPA) at several locations throughout the SDAB (Figures 9.1a-e) and are referenced to the Standards of 2011 (Table 9.1). The equipment are listed in Tables 9.2 and 9.3.

Figure 9.1a $PM_{2.5}$ Network Map



Location of continuous samplers only (yellow stickpins)
Location of a sequential sampler, a continuous sampler, and a speciated sampler (red stickpin)
Location of a sequential samplers only (green stickpin)

Table 9.1 $PM_{2.5}$ State and Federal Standards for the Year

Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	15.0 µg/m³		

Figure 9.1b PM$_{2.5}$ FEM & non-FEM Network Map

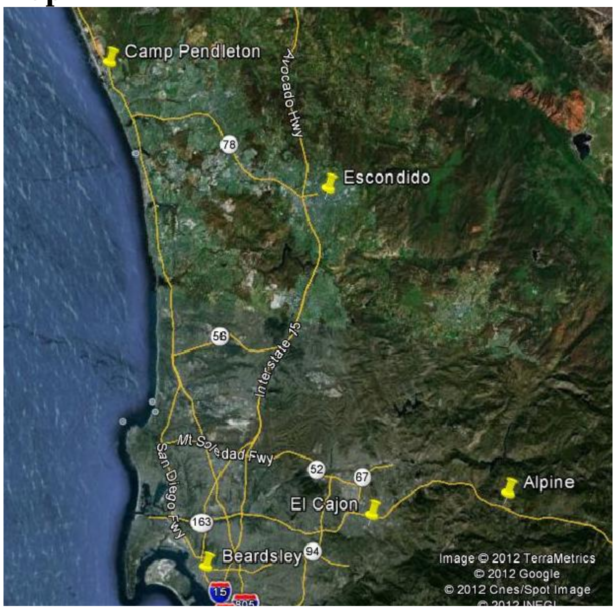


Figure 9.1c PM$_{2.5}$ FRM Network Map

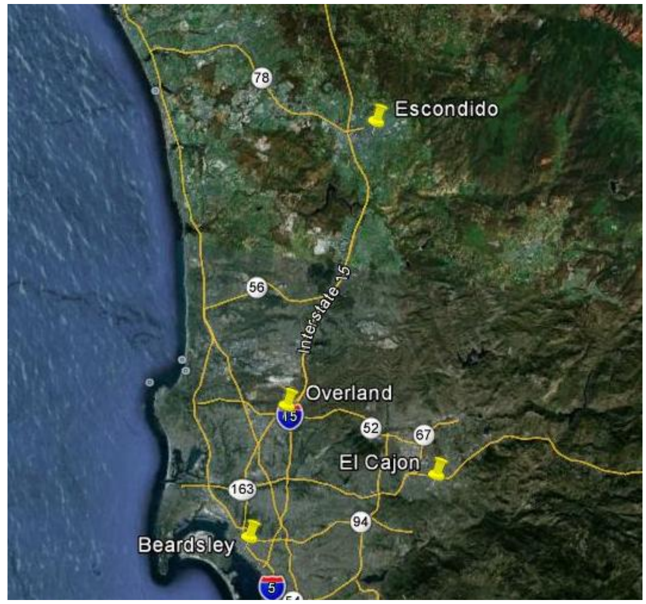


Figure 9.1d PM$_{2.5}$ CSN & STN Network Map

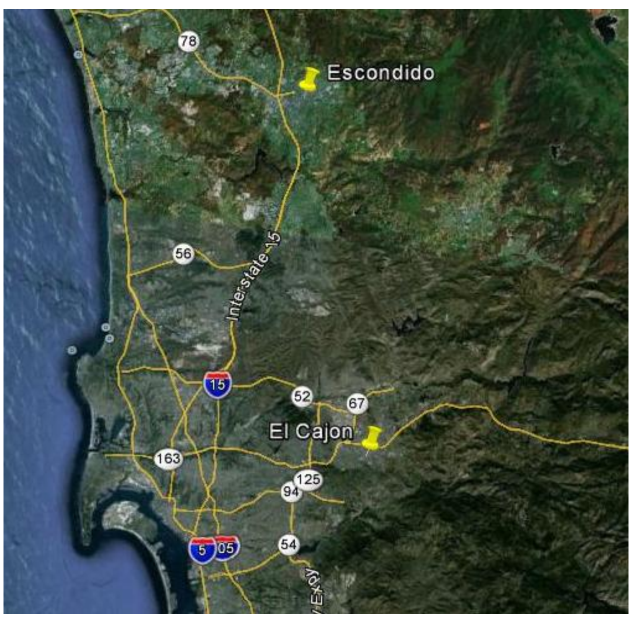


Figure 9.1e PM$_{2.5}$ CSM-Carbon (SDAPCD) Map

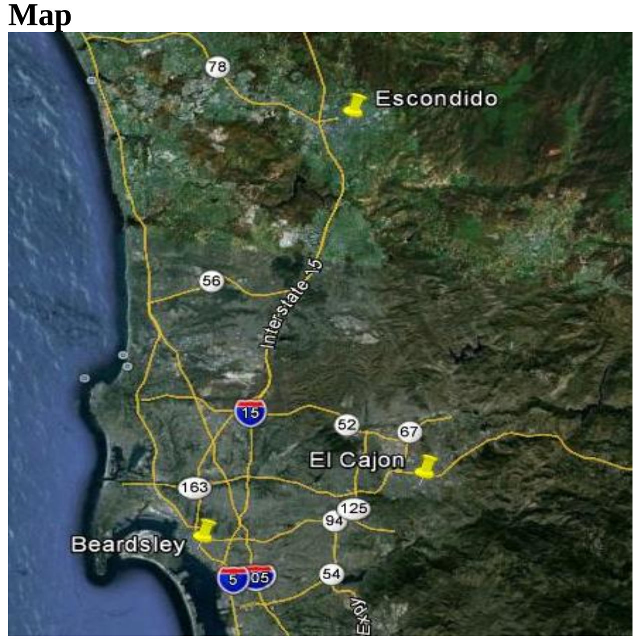


Table 9.2 $PM_{2.5}$ Sampling Network

Abbreviation	ALP	CMP	CVA	ECA	ESC	OTM	DVN	DTN	KMA
Name	Alpine	Camp Pendleton	Chula Vista	El Cajon	Escondido	Otay Mesa-Border Xing	Otay Mesa-Donovan	San Diego-Beardsley	San Diego-Overland
Address	2300 W. Victoria Dr.	21441 W. B St.	80 E. J St.	1155 Redwood Ave.	600 E. Valley Pkwy	1100B Paseo International	Donovan State Prision Rd.	1110A Beardsley St.	5555 Overland Ave.
Latitude	32° 50' 32" N	33° 13' 01" N	32° 37' 52" N	32° 47' 28" N	33° 07' 40" N	32° 33' 08" N	32° 34' 46" N	32° 42' 05" N	32° 50' 11" N
Longitude	116° 46' 06" W	117° 23' 46" W	117° 03' 33" W	116° 56' 32" W	117° 04' 31" W	116° 56' 16" W	116° 55' 46" W	117° 08' 59" W	117° 07' 43" W
AQS ID	06 073 1006	06 073 1008	06 073 0001	06 073 0003	06 073 1002	06 073 2007	06 073 1014	06 073 1010	06 073 0006

$PM_{2.5}$ (non-speciated)

	ALP	CMP	CVA	ECA	ECA	ESC	ESC	OTM	DVN	DTN	DTN	KMA
Monitor Designation	SPM	SLAMS	SLAMS	SLAMS, NCore	SLAMS, NCore	**SLAMS**	SLAMS			SLAMS	SLAMS	**SLAMS**
Primary Designation		Yes	Yes		Yes		Yes				Yes	**Yes**
Sampling Method	CT	CT	SQ	CT	SQ	**CT**	SQ			CT	SQ	**SQ**
Spatial Scale	US	NS	NS	NS	NS	**NS**	NS			NS	NS	**NS**
Monitoring Objective (Federal)	RC	BL	RC	RC	RC	**RC**	RC			RC	RC	**RC**
Monitoring Objective (Local)	Burn											
Analysis By	Sonoma Tech Inc. for USC	SDAPCD	SDAPCD	SDAPCD	SDAPCD	**SDAPCD**	SDAPCD			SDAPCD	SDAPCD	**SDAPCD**
Sampling Frequency	7 / 24	7 / 24	1:3	7 / 24	1:3	**7 / 24**	1:3			7 / 24	1:1	**1:3**
Equipment Manufacturer/Model	Met One BAM	Met One FEM BAM[2]	Thermo 2025	Met One FEM BAM[3]	Thermo 2025	**Met One FEM BAM**	Thermo 2025			Met One FEM BAM[4]	Thermo 2025	**Thermo 2025**

$PM_{2.5}$ (speciated)

	ALP	CMP	CVA	ECA	ECA	ECA	ESC	ESC	ESC	OTM	DVN	DTN	KMA
Monitor Designation				CSN, NCore	STN, NCore	CSM Carbon-speciated	CSN	STN	CSM Carbon-speciated			CSM	
Sampling Method				SP	SP	SP	SP	SP	SP			SP	
Spatial Scale				NS	NS	NS	NS	NS	NS			NS	
Monitoring Objective (Federal)				RC	RC	RC	RC	RC	RC			RC	
Monitoring Objective (Local)													
Analysis By				EPA	EPA	SDAPCD	CARB	CARB	SDAPCD			SDAPCD	
Sampling Frequency				1:3	1:3	1:6	1:6	1:6	1:6			1:6	
Equipment Manufacturer/Model				URG-3000N	Met One SASS	Met One SASS	URG-3000N	Met One SuperSASS	Met One SASS			Met One SASS	

GLOSSARY OF TERMS

Monitor Designation

PAMS	Photochemical Assessment Monitoring
SLAMS	State and Local Air Monitoring Stations
SPM	Special Purpose Monitoring
NCore	National Core
QA	Quality Assurance collocated
CSN	Chemical Speciation Network
STN	Speciation Trends Network
CSM	Community Scale Monitoring (SDAPCD)
CA TAC	California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

CL	Chemiluminescence
CT	Low volume, continuous sampler, size selective inlet
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
IPMS	Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale

MI	Micro Scale
MS	Middle 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] The El Cajon station has a PM_{10}, low flow, to be used in conjunction $PM_{2.5}$ to calculate PMcoarse

Bold & Yellowed areas indicate a collocation of samplers to satisfy Federal QA requirements.

[1] The BAM sampler was replaced by a FEM-BAM on 11/8/11

[2] The BAM sampler was replaced by a FEM-BAM on 3/4/11

[3] The BAM sampler was replaced by a FEM-BAM on 1/18/11

Section 9.1.0 $PM_{2.5}$ – Sampling Frequency

Requirements for the sampling frequency of monitors for pollutants are in the July 1, 2010 edition of the 40 CFR Part 58-“Ambient Air Quality Surveillance”, section 58.12 “Operating Schedules”. The sampling frequency for the samplers are in table 9.2 and 9.3a.

Section 9.2.0 $PM_{2.5}$ - Sampling Equipment

The sequential sampler requires a sample deposition media (filter); runs every x-days (see above) for a duration of 24 hrs. The filters are manually loaded, collected and programmed to run weekly.

Table 9.3a $PM_{2.5}$ Sampling Equipment

Pollutant	Abbrev	Sampler	FRM or FRM Method	Frequency	Analytical Method	Reported Data Interval	Parameter Number	Method Code
Particulate Matter 2.5 µm or less (non-speciated)	$PM_{2.5}$	Met One BAM	No	7/24 Continuous	Continuous sampler, size selective inlet, low volume sampling	1 hour	88501	170
Particulate Matter 2.5 µm or less (non-speciated)	$PM_{2.5}$	Met One FEM BAM	Yes	7/24 Continuous	Continuous sampler, size selective inlet, low volume sampling	1 hour	88101	170
Particulate Matter 2.5 µm or less (non-speciated)	$PM_{2.5}$	Thermo 2025	Yes	1:6, 1:3, or 1:1	Sequential sampler, size selective inlet, low volume sampling	24 Hour	88101	105
Particulate Matter 2.5 µm or less (speciated)	$PM_{2.5}$	URG-3000N	n/a	1:3 or 1:6	Sequential sampler, size selective inlet, low volume sampling	24 Hour	See EPA or ARB	See EPA or ARB
Particulate Matter 2.5 µm or less (speciated)	$PM_{2.5}$	Met One SASS or SuperSASS	n/a	1:3 or 1:6	Sequential sampler, size selective inlet, low volume sampling	24 Hour	See EPA or ARB	See EPA or ARB
Particulate Matter 2.5 µm or less (speciated)	$PM_{2.5}$	Met One SASS or SuperSASS	n/a	1:6	Sequential sampler, size selective inlet, low volume sampling	24 Hour	See Table 9.3b	See Table 9.3b

Table 9.3b $PM_{2.5}$ Sampling Carbon-Speciated Table of the Parameters for the CSM-SDAPCD Network

Parameter	OC $PM_{2.5}$ Lc Tor	EC $PM_{2.5}$ Lc Tor	OC1 $PM_{2.5}$ Lc	OC2 $PM_{2.5}$ Lc	OC3 $PM_{2.5}$ Lc	OC4 $PM_{2.5}$ Lc	OP $PM_{2.5}$ Lc Tor	EC1 $PM_{2.5}$ Lc	EC2 $PM_{2.5}$ Lc	EC3 $PM_{2.5}$ Lc
Code	88320	88321	88324	88325	88326	88327	88328	88329	88330	88331
Method Code	815	815	814	814	814	814	814	814	814	814

Section 9.3.0 $PM_{2.5}$ Trend (FRM and FEM) (Local/County)

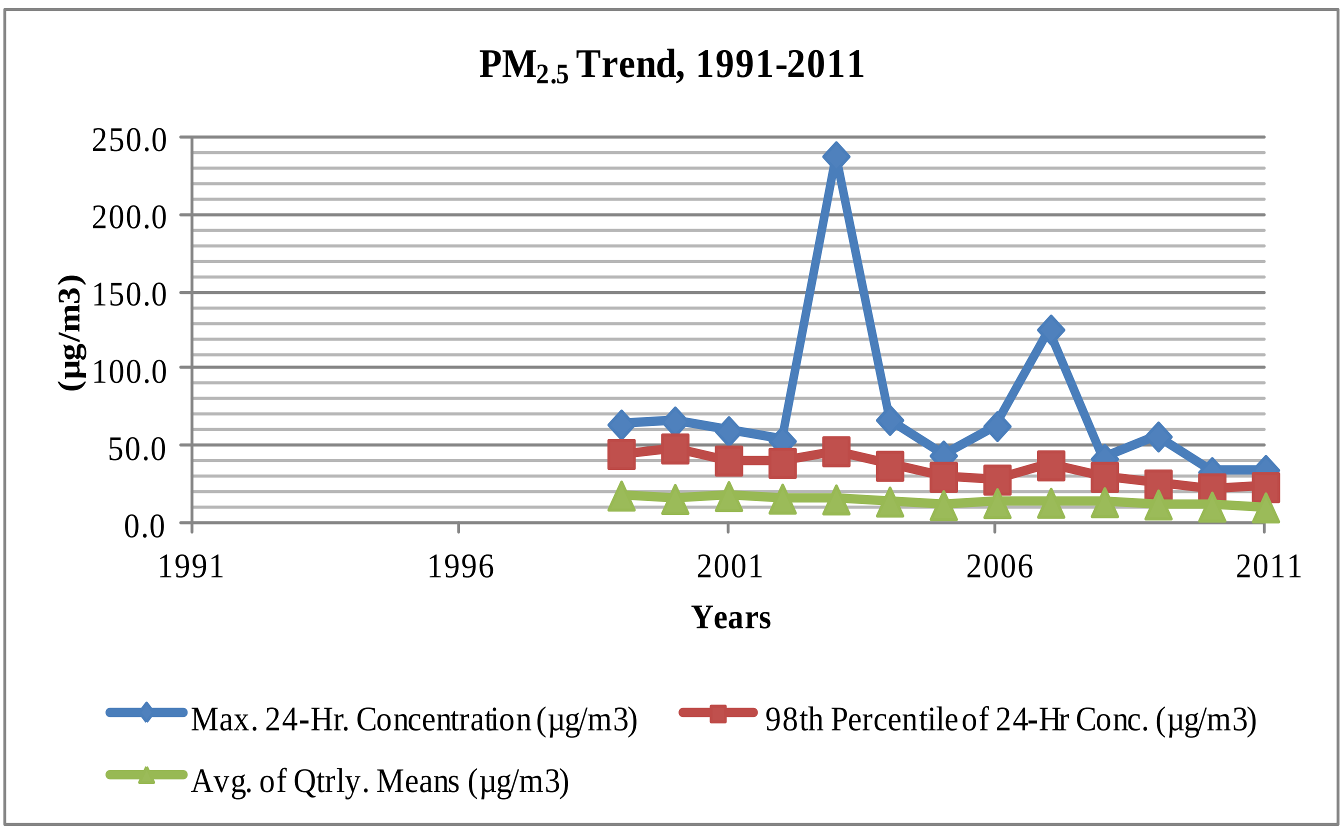
Annual average $PM_{2.5}$ concentrations in the San Diego Air Basin have declined over the years, Table 9.4. The State annual average concentrations also decreased within this period. The high maximum 24-hour concentrations measured in 2003 and 2007, were due to severe wildfires that occurred in Southern California. The 98th percentile of 24-hour $PM_{2.5}$ concentrations showed substantial variability within this period, a reflection of changes in meteorology and the influence of the 2003 and 2007 wildfires. Please note, the "Days Above the Standard" row in Table 9.4 reflects the $PM_{2.5}$ standard for that year. Figure 9.2 graphs the SDAB $PM_{2.5}$ trend over the years.

Table 9.4 $PM_{2.5}$ Summary of Concentrations for the Last 20 Years

$PM_{2.5}$ (µg/m³)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Max. 24-Hr. Concentration (µg/m³)	*	*	*	*	*	*	*	*	64.3	66.3	60.0	53.6	239.2	67.3	44.1	63.3	126.2	42.0	56.5	33.3	34.7
98th Percentile of 24-Hr Conc. (µg/m³)	*	*	*	*	*	*	*	*	45.1	48.7	40.8	39.3	46.9	37.4	30.2	28.4	37.7	30.2	25.2	22.7	23.5
Avg. of Qtrly. Means (µg/m³)	*	*	*	*	*	*	*	*	18.0	15.8	17.7	16.0	15.5	14.1	11.8	13.1	13.3	13.7	12.2	10.8	10.3
Days Above Max 24-Hr Conc	*	*	*	*	*	*	*	*	0	0	0	0	5	0	0	0	5	0	0	0	0

* The $PM_{2.5}$ program was implemented in 1999

Figure 9.2 $PM_{2.5}$ Concentrations for the Last 20 Years Graph



Section 9.4.0 $PM_{2.5}$ Measurements (FRM and FEM) by Site

Table 9.5a $PM_{2.5}$ FRM Measurements by Site

	Location	Maximum Concentration for 24-hrs (µg/m^3)	Number of Days Above the National Standard (#)	Annual Average (µg/m^3)
SEQUENTIAL	Chula Vista	27.9	0	9.9
	San Diego-Beardsley	34.7	0	10.9
	Escondido	27.4	0	10.4
	San Diego-Overland	**29.9**	**0**	**9.0**
	El Cajon	29.7	0	10.6
San Diego Air Basin Overall Average (Sequential)				10.2

Table 9.5b $PM_{2.5}$ FEM Measurements by Site

	Location	Maximum Concentration for 24-hrs (µg/m^3)	Number of Days Above the National Standard (#)	Annual Average (µg/m^3)
CONTINUOUS	*Alpine non-FEM	25.5	0	13.0
	Camp Pendleton	36.7	0	12.2
	El Cajon	38.7	1	14.2
	San Diego-Beardsley	35.5	1	13.8
	Escondido	**72.0**	**3**	**15.9**
San Diego Air Basin Overall Average (Continuous)				13.8

Bold & Yellowed areas indicate a collocation of samplers to satisfy Federal QA requirements.

*The continuous $PM_{2.5}$ sampler at the Alpine location is a non-FEM Met One BAM 1020 and cannot be used for comparison to the NAAQS. It is operated by District personnel, but owned by Sonoma Technology, Inc., as part of the ARB's Children's Health Study. The District has no influence as to the type of sampler that is used for this program. For information on the Children's Health Study refer to the ARB's website at http://www.arb.ca.gov/research/chs/chs.htm.

Figure 9.3a $PM_{2.5}$ FRM Measurements by Site Graph

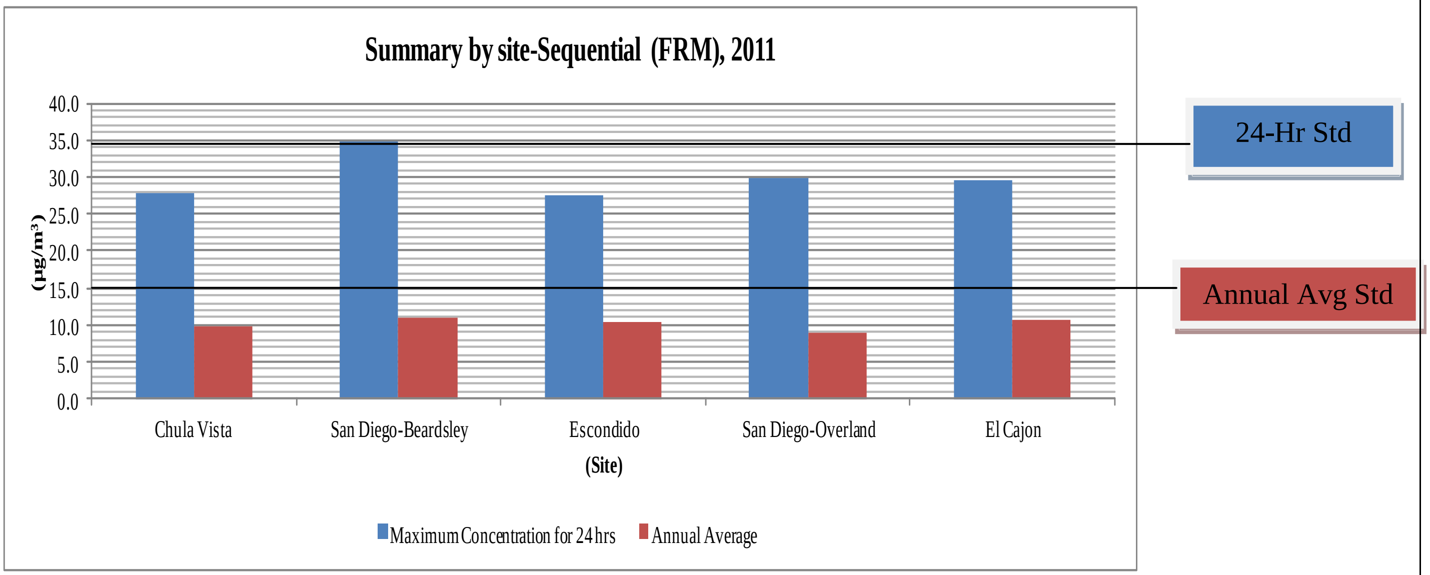
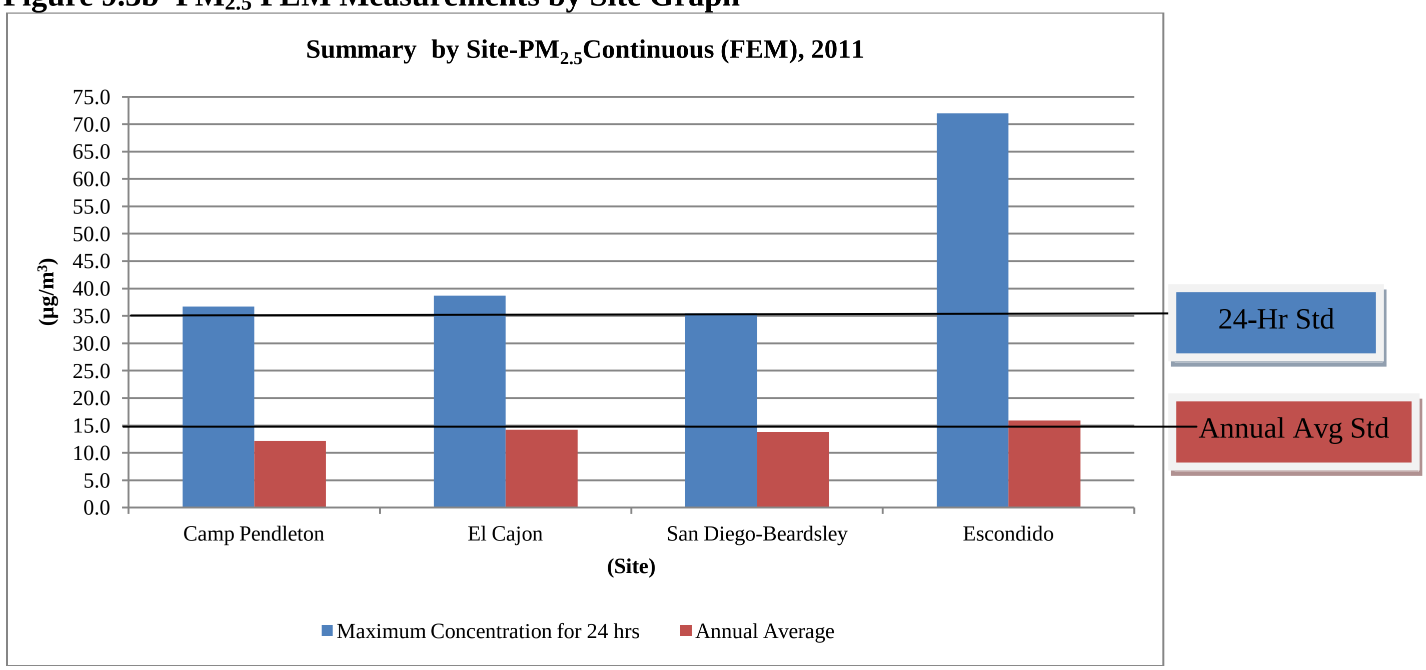


Figure 9.3b $PM_{2.5}$ FEM Measurements by Site Graph



9.4.1 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 on a neighborhood scale and the concentrations should be representative of concentrations expected over an area with dimensions of a few kilometers. The monitor should not be located too closely to a hotspot of $PM_{2.5}$ concentrations. All of the PM2.5 FRM and FEM samplers are sited to be neighborhoods scale and can be compared to the NAAQS.

Section 9.5.0 $PM_{2.5}$ Design Criteria Requirements from the Code of Federal Regulations

Requirements for the number of $PM_{2.5}$ monitors for the criteria pollutants are in the July 1, 2010 edition of 40 CFR Part 58-"Ambient Air Quality Surveillance", Subpart G-Federal Monitoring, Appendix D, Section 4-Pollutant-"Specific Design Criteria for SLAMS Sites" (see italics below). Please note, only the passages applicable to the SDAB have been cited.

4.7 Fine Particulate Matter ($PM_{2.5}$) Design Criteria.
4.7.1 General Requirements.
(a) State, and where applicable local, agencies must operate the minimum number of required $PM_{2.5}$ SLAMS sites listed in Table D–5 of this appendix. The NCore sites are expected to complement the $PM_{2.5}$data collection that takes place at non-NCore SLAMS sites, and both types of sites can be used to meet the minimum $PM_{2.5}$ network requirements. Deviations from these $PM_{2.5}$ monitoring requirements must be approved by the EPA Regional Administrator.

Table D–5 of Appendix D to Part 58—$PM_{2.5}$ Minimum Monitoring Requirements

MSA population[1,2]	***Most recent 3-year design value ≥85% of any $PM_{2.5}$ NAAQS[3]***	***Most recent 3-year design value <85% of any $PM_{2.5}$ NAAQS[3,4]***
>1,000,000	*3*	*2*
500,000–1,000,000	*2*	*1*
50,000–<500,000[5]	*1*	*0*

[1]Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).
[2]Population based on latest available census figures.
[3]The $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.
[4]These minimum monitoring requirements apply in the absence of a design value.
[5]Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

(b) Specific Design Criteria for $PM_{2.5}$. The required monitoring stations or sites must be sited to represent community-wide air quality. These sites can include sites collocated at PAMS. These monitoring stations will typically be at neighborhood or urban-scale; however, in certain instances where population-oriented micro-or middle-scale $PM_{2.5}$ monitoring are determined by the Regional Administrator to represent many such locations throughout a metropolitan area, these smaller scales can be considered to represent community-wide air quality.

(1) At least one monitoring station is to be sited in a population-oriented area of expected maximum concentration.

(2) For areas with more than one required SLAMS, a monitoring station is to be sited in an area of poor air quality.

(3) Additional technical guidance for siting $PM_{2.5}$ monitors is provided in references 6 and 7 of this appendix.

4.7.2 Requirement for Continuous $PM_{2.5}$ Monitoring. The State, or where appropriate, local agencies must operate continuous $PM_{2.5}$ analyzers equal to at least one-half (round up) the *minimum required sites listed in Table D–5 of this appendix. At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM monitors, unless at least one of the required FRM/FEM/ARM monitors is itself a continuous FEM or ARM monitor in which case no collocation requirement applies. State and local air monitoring agencies must use methodologies and quality assurance/quality control (QA/QC) procedures approved by the EPA Regional Administrator for these required continuous analyzers.*

4.7.3 Requirement for $PM_{2.5}$ Background and Transport Sites. Each State shall install and operate at least one $PM_{2.5}$ site to monitor for regional background and at least one $PM_{2.5}$ site to monitor regional transport. These monitoring sites may be at community-oriented sites and this requirement may be satisfied by a corresponding monitor in an area having similar air quality in another State. State and local air monitoring agencies must use methodologies and QA/QC procedures approved by the EPA Regional Administrator for these sites. Methods used at these sites may include non-federal reference method samplers such as IMPROVE or continuous $PM_{2.5}$ monitors.

4.7.4 $PM_{2.5}$ Chemical Speciation Site Requirements. Each State shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the $PM_{2.5}$ Speciation Trends Network (STN). The selection and modification of these STN sites must be approved by the Administrator. The $PM_{2.5}$ chemical speciation urban trends sites shall include analysis for elements, selected anions and cations, and carbon. Samples must be collected using the monitoring methods and the sampling schedules approved by the Administrator. Chemical speciation is encouraged at additional sites where the chemically resolved data would be useful in developing State implementation plans and supporting atmospheric or health effects related studies

4.7.5 Special Network Considerations Required When Using $PM_{2.5}$ Spatial Averaging Approaches. (a) The $PM_{2.5}$ NAAQS, specified in 40 CFR part 50, provides State and local air monitoring agencies with an option for spatially averaging $PM_{2.5}$ air quality data. More specifically, two or more community-oriented (i.e., sites in populated areas) $PM_{2.5}$ monitors may be averaged for comparison with the annual $PM_{2.5}$ NAAQS. This averaging approach is directly related to epidemiological studies used as the basis for the $PM_{2.5}$ annual NAAQS. Spatial averaging does not apply to comparisons with the daily $PM_{2.5}$ NAAQS.

(b) State and local agencies must carefully consider their approach for $PM_{2.5}$ network design when they intend to spatially average the data for compliance purposes. These State and local air monitoring agencies must define the area over which they intend to average $PM_{2.5}$ air quality concentrations. This area is defined as a Community Monitoring Zone (CMZ), which characterizes an area of relatively similar annual average air quality. State and local agencies can define a CMZ in a number of ways, including as part or all of a metropolitan area. These CMZ must be defined within a State or local agencies network description, as required in §58.10 of this part and approved by the EPA Regional Administrator. When more than one CMZ is described within an agency's network design plan, CMZs must not overlap in their geographical coverage. The criteria that must be used for evaluating the acceptability of spatial averaging are defined in appendix N to 40 CFR part 50.

Section 9.5.1 $PM_{2.5}$ Design Criteria for the SDAB Actual

Table 9.6a1 $PM_{2.5}$ FRM SLAMS Samplers Annual Design Value Data for the SDAB

Annual Design Value (2009 - 2011) (µg/m^3)	Is the Annual Design Value < 85% of the NAAQS? (yes/no)	Met NAAQS 2011 ? (yes/no)	Annual Design Value Site (name)	Annual Design Value Site AQS ID (#)
11.8	Yes	Yes	El Cajon	06-073-0003

Table 9.6a2 $PM_{2.5}$ FRM SLAMS Samplers Daily (24-Hr) Design Value Data for the SDAB

Daily Design Value (2011) (µg/m^3)	Is the Daily Design Value < 85% of the NAAQS? (yes/no)	Met NAAQS 2011 ? (yes/no)	Daily Design Value Site (name)	Daily Design Value Site AQS ID (#)
24	Yes	Yes	San Diego-Beardsley St. El Cajon	06-073-1010 06-073-0003

Table 9.6a3 $PM_{2.5}$ FRM SLAMS Samplers Design Criteria for the Minimum Number of Samplers Needed

MSA (name)	County (name)	2011 Population from 2010 Census (#)	Minimum Number of non-Speciated Sequential Samplers Required (#)	Number of Active non-Speciated Sequential Samplers (#)	Number of Sequential Samplers Needed (#)	Site of Expected Maximum Concentratio n (name)	Site of Expected Maximum Concentration AQS ID (#)
San Diego	San Diego	3.2 million	2	5	None	Escondido	60-073-1002

Table 9.6b1 $PM_{2.5}$ FEM Samplers Annual Design Value Data for the SDAB

Annual Design Value (2009 - 2011) (µg/m^3)	Is the Annual Design Value < 85% of the NAAQS? (yes/no)	Met NAAQS 2011 ? (yes/no)	Annual Design Value Site (name)	Annual Design Value Site AQS ID (#)
14.7	No	No	Escondido	06-073-1002

Table 9.6b2 $PM_{2.5}$ FEM Samplers Daily (24-Hr) Design Value Data for the SDAB

Daily Design Value (2011) (µg/m^3)	Is the Daily Design Value < 85% of the NAAQS? (yes/no)	Met NAAQS 2011 ? (yes/no)	Daily Design Value Site (name)	Daily Design Value Site AQS ID (#)
28.5	Yes	Yes	Escondido	06-073-1002

Table 9.6b3 $PM_{2.5}$ FEM Samplers Design Criteria for the Minimum Number Needed

Minimum Number of Required Continuous Samplers = ½ Minimum Number of Required Sequential Samplers Rounded Up (#)	Minimum Number of non-Speciated Continuous Samplers Required (#)	Number of Active non-Speciated Continuous Samplers (#)	Number of Continuous Samplers Needed (#)	Site of Expected Maximum Concentration (name)	Site of Expected Maximum Concentration AQS ID (#)
2 x (½) = 1	1	4	None	Escondido	60-073-1002

Table 9.6c $PM_{2.5}$ Speciated Samplers Design Criteria for the Minimum Number Needed

Minimum Number of Sites to Maintain (#)	Number of Active Required Monitors (#)	Number of Monitors Needed (#)
2*	5**	None

*There are no minimum guidelines for the design of the $PM_{2.5}$ CSN site requirements, other than to maintain the current speciation network as designed by the governing authorities.

**The District also operates its own Carbon-speciated program by collecting samples via an unused SASS channel at the Escondido and El Cajon locations and by operating its own SASS sampler at the San Diego-Beardsley location. The District analyzes for particulate organic carbon (OC) and elemental carbon (EC) with a DRI 2001A Thermal/Optical analyzer. This adds one non-Required CSN site to the network. It is designated as CSM-SDAPCD (also known as Supplemental Speciation).

Table 9.6d $PM_{2.5}$ ALL Type Samplers Design Criteria for the Minimum Number Needed

MSA (name)	County (name)	2011 Population from 2010 Census (#)	Minimum Number of non-Collocated ALL types of $PM_{2.5}$ Samplers Needed (#)	Minimum Number of Collocated ALL types of $PM_{2.5}$ Samplers Needed (#)	Total Number of ALL Types of $PM_{2.5}$ Samplers Needed (#)	Number of Active ALL Types of $PM_{2.5}$ Samplers (#)	Monitors Needed (#)
San Diego	San Diego	3.2 million	9	2	11	17	None

There are 17 $PM_{2.5}$ samplers at six locations.

- There are six sequential samplers in total at five locations
  - Five samplers are designated as primary samplers
  - All six samplers are FRM
  - One sampler is designated for QA/Collocation purposes
    - There are two locations that have FRM samplers only
    - There are three locations that are collocated with FEM samplers
    - There are two locations that are collocated with STN and CSN samplers
    - There is one location that is collocated with a CSM sampler used for Carbon analysis
- There are six continuous samplers in total at five locations
  - One sampler is designated as a primary sampler
  - One sampler is designated for QA/Collocation purposes
  - One sampler is non-FEM
  - Five samplers are FEM
    - There is one location that has a FEM sampler only
    - There are three locations that are collocated with the FRM samplers
    - There are two locations that are collocated with STN and CSN samplers
    - There is one location that is collocated with a CSM sampler used for Carbon analysis
- There are two STN samplers in total
    - Both locations are collocated with CSN samplers
- There are two CSN samplers in total
    - Both locations are collocated with the CSN samplers
- There is one CSM-Carbon Speciated Sampler for Supplemental Speciation
    - The other two CSM-“samplers” use a channel from the STN samplers

All FRM samplers, regardless of collocation status with a FEM sampler, are designated as Primary Samplers for comparison to the NAAQS.

Any FEM sampler not collocated with a FRM sampler is designated as a Primary Sampler for comparison to the NAAQS. Only the FEM-BAM at CPD meets this definition.

Section 9.6.0 $PM_{2.5}$ Quality Control (QC) Practices for the Network

Table 9.7a $PM_{2.5}$ QC Measures

	Quality Control Measures (Field)	
	Calibration	Flow Rate Verification
Frequency	Every site four times a year *	Every four weeks
Personnel	By personnel who do not perform the audits	By site operator
Reference	40 CFR Part 50, App. L	40 CFR Part 58, App. A, Sections 3.2.3 & 3.3.2 (Table A–2)
Equipment Used (Calibrator)	With Variable Flow Rate instrumentation, thermocouple, and barometric pressure sensor used for calibrations only	With Variable Flow Rate instrumentation, thermocouple, and barometric pressure sensor used for verifications only
Certifications	Field Equipment = 1/yr	Field Equipment = 1/yr

*twice the minimum frequency

Table 9.7b $PM_{2.5}$ QC Measures for the Laboratory

Quality Control Measures (Laboratory)		
Equipment	Reference	Frequency
Filter Conditioning Environment	40 CFR Part 50, Appendix L, Sections 8.2 & 10.3	All filters
Filters	Quality Assurance Guidance Document 2.12, Section 7.7, 8.2, & 8.3	All filters
Filter Weighings	40 CFR Part 50, Appendix L, Section 8.0	Within 30 days of collection
Working Mass standards	Quality Assurance Guidance Document 2.12, Sections 4.3.7 & 7.3	Yearly

In addition to processing the $PM_{2.5}$ sequential filters for the District's seven PM sequential samplers (one is for the PM_{10} Lo-Vol sampler at the El Cajon NCore location), the District processes $PM_{2.5}$ filters for six additional $PM_{2.5}$ sequential filter samplers from Kern and Imperial County. Please note, all official decisions regarding the $PM_{2.5}$ data from Kern and Imperial County are made by the designated authority from those Counties.

Section 9.7.0 $PM_{2.5}$ Quality Assurance (QA) Practices for the Network

Table 9.8a $PM_{2.5}$ QA Measures

	Quality Assurance Measures (Field)			
	Internal Local (District) Audits	Collocation	External State (ARB) Audits	External Federal (PEP) Audits
Frequency	Every site 4/yr*	Same frequency and time as the primary sampler	75% of the monitors/yr randomly selected personnel	Audits ≤ 5sites/yr
Personnel	With personnel who do not perform the calibrations	n/a	Manually performed by randomly selected personnel	Manually performed by randomly selected personnel
Reference (Field)	40 CFR Part 58 App. A, Section 3.2.4	40 CFR Part 58 App. A, Section 3.2.5.1 (a)	40 CFR Part 58 App. A, Section 3.2.4	40 CFR Part 58 App. A, Section 3.2.7
Equipment Used (Field)	With Flow Transfer Standard and Thermocouple used for audits only	Same equipment as the primary sampler	See ARB	See EPA
Certifications	Field Equipment = 1/yr	Field Equipment = 1/yr	See ARB	See EPA

*twice the minimum frequency

Table 9.8b $PM_{2.5}$ QA Measures for the Laboratory

Quality Assurance Measures (Laboratory)		
Equipment	Reference	Frequency
Working Mass standards	Quality Assurance Guidance Document 2.12 Sections 4.3.7 & 7.3	Quarterly
Temperature & Relative Humidity	Quality Assurance Guidance Document 2.12 Section 3.3, 4.3.7, & 7.6	Quarterly
Balance	Quality Assurance Guidance Document 2.12 Section 3.3 & 7.2	Yearly
Working Mass standards vs. primary standards	Quality Assurance Guidance Document 2.12 Sections 4.3 & 7.3	Quarterly
Primary standards	Quality Assurance Guidance Document 2.12 Section 4.3 & 7.3	Yearly

The District also submits $PM_{2.5}$ accuracy data for Imperial County. All official decisions regarding the data are made by the designated authority from Imperial County.

Section 9.7.1 $PM_{2.5}$ Quality Assurance (QA) Collocation Requirements for the Network

According 40 CFR Part 58, Appendix A, Section 3.2.5.1 (a), 15 percent of the monitors (values of 0.5 and greater round up) must be collocated. All non-collocated monitors/samplers are called "main".

Table 9.9a $PM_{2.5}$ FRM Quality Assurance Collocation Requirements for the Network

Main Monitors				Collocated Monitors				
Minimum Number of Monitors Required (#)	Number of Active Monitors (#)	Number of Active Monitors Designated as Primary Monitors (#)	Number of Monitors Needed (#)	Number of Monitors Needed for Collocation = 15% x Minimum Number of Sites Required for Sequential Samplers Rounded Up (#)	Number of Active Monitors Used for Collocation (#)	Number of Monitors Needed for Collocation (#)	Location of Collocated Site(s) (name)	Collocated Site AQS ID (#)
2	5	5	None	2 x (15%) = 1	1	none	San Diego-Overland	06-073-0006

The $PM_{2.5}$ FRM collocated monitors at the San Diego-Overland location meet all collocation citing specifications. When the Overland station relocates to KVR, collocated monitoring will continue there.

Table 9.9b $PM_{2.5}$ FEM Quality Assurance Collocation Requirements for the Network

Main Monitors				Collocated Monitors				
Minimum Number of Monitors Required (#)	Number of Active Monitors (#)	Number of Active Monitors Designated as Primary Monitors (#)	Number of Monitors Needed (#)	Number of Monitors Needed for Collocation = 15% x Minimum Number of Sites Required for Continuous Samplers Rounded Up (#)	Number of Active Monitors Used for Collocation (#)	Number of Monitors Needed for Collocation (#)	Location of Collocated Site (name)	Collocated Site AQS ID (#)
1	4	1	None	1 x (15%) = 1	1	none	Escondido	06-073-1002

The $PM_{2.5}$ FEM collocated monitors at the Escondido location meet all collocation citing specifications.

Table 9.9c $PM_{2.5}$ FRM Collocation with $PM_{2.5}$ FEM Samplers Requirements for the Network

Minimum Number of FRM & FEM Collocated Sites Required (#)	Number of Active FRM & FEM Collocated Sites (#)	Number of FRM & FEM Collocated Sites Needed (#)	Location of FRM & FEM Active Collocated Sites (name)	FRM & FEM Collocated Sites AQS ID (#)
1	3	None	El Cajon Escondido San Diego-Beardsley	06-073-0003 06-073-1002 06-073-1010

Table 9.9d $PM_{2.5}$ STN Samplers Collocation with CSN Samplers Requirements for the Network

Minimum Number of Active STN Sites to Maintain (#)	Minimum Number of Active CSN Sites to Maintain (#)	Minimum Number of STN & CSN Collocated Sites to Maintain =Number of STN Sites (#)	Number of STN & CSN Collocated Sites Needed (#)	Location of STN & CSN Active Collocated Sites (name)	STN & CSN Collocated Sites AQS ID (#)
2	2	2	None	El Cajon Escondido	06-073-0003 06-073-1002

Section 9.8.0 $PM_{2.5}$ Changes to the Network

The ARB undertook a partnership with the districts in placing $PM_{2.5}$ monitors throughout California. Several factors were accounted for, such as temperature, humidity, precipitation, wind speeds, and elevation. The EPA Region IX governing authority approved the ARB's statewide distribution plan for the placement of the $PM_{2.5}$ monitors within each district and the location of the collocated monitors for each district to satisfy the quality assurance requirements of 40 CFR Part 58. Any changes to the $PM_{2.5}$ network in the San Diego Air Basin will be undertaken in partnership and advisement with the ARB.

Any official decommissioning of any monitor or monitoring location will be proposed in a letter with accompanying documentation to the EPA and the ARB, when applicable. If a station is to relocate, parallel sampling between the current location and the new location will be undertaken, when possible.

Note, some monitoring stations are being relocated due to tenancy issues.

Section 9.8.1 $PM_{2.5}$ Changes to the Design Criteria Requirements from the Code of Federal Regulations

The $PM_{2.5}$ design criteria applicable to calendar year (CY) 2013 have not changed, so the information in Table 9.5 will apply to CY 2013.

Section 9.8.2 $PM_{2.5}$ Changes to the Equipment

None

Section 9.8.3 $PM_{2.5}$ Changes to the Sampling Locations

Otay Mesa station

The North American Free Trade Agreement (NAFTA) greatly increased the heavy truck traffic at the Otay Mesa border crossing. It is now the second busiest commercial truck border crossing in the United States and the busiest in California. This has forced the re-designation of the Otay Mesa station instruments from Neighborhood Scale to MicroScale and Impact levels. This station has O_3, NOx, meteorological equipment, and XonTech 924 & 910A-Fused Silica Lined samplers for Toxics sampling.

To measure concentrations representative of the air mass in the south San Diego region, the District proposes to decommission the Otay Mesa border location and relocate the station about 3.3 kilometers northeast off the entrance road to the Donovan State Prison grounds (Google Earth coordinates of 32°34'41.80"N, 116°55'16.70"W). The proposed new station will house O_3, NOx, $PM_{2.5}$-Continuous (non-speciated), meteorological equipment, and XonTech 924 & 910A-Fused Silica Lined samplers for Toxics sampling (plus collocation). Parallel sampling will be undertaken with O_3 and NOx, spare equipment permitting. The projected timeline for the relocation is late 2012-early 2013.

San Diego-Overland

Due to tenancy issues, the District relocated the San Diego-Overland (KMA) site in Kearny Mesa to a new location off Kearny Villa Road (KVR) in the 1st quarter of 2012. Since late 2010, O_3 has been collected in parallel at KVR with the KMA location. In late 2011, NOx has been collected in parallel at the KVR location with the KMA location (the District does not have the resources to run parallel sampling for the other pollutants at the KVR site). The new station houses O_3, NOx, PM_{10} (plus a collocated sampler), $PM_{2.5}$-Sequential (non-speciated), plus a collocated sampler, PAMS-Carbonyl equipment, and meteorological equipment.

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

Section 10.0.0 Particulate Matter 10 µm (PM_{10}) Introduction

For 2011, PM_{10} (High Volume) was sampled with nine samplers at six locations* (two were used for QA purposes) in the SDAB (Figure 10.1) and referenced to the Standards of 2010 (Table 10.1). There is a PM_{10} (low volume) sampler (set to a 1:3 cycle) at the El Cajon location. The equipment used are in Tables 10.2 and 10.3.

Figure 10.1 PM_{10} Map of the Network

* The PM_{10} (hi-vol) sampler at El Cajon was discontinued on 6/30/2011 to make room for the TSP-Pb sampler to satisfy new NCore requirements. There is now a PM_{10} (lo-vol) sampler at the El Cajon location that is also part of the paired lo-vol samplers needed to calculate PMcoarse.

Table 10.1 PM_{10} State and Federal Standards for the Year

Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m³	Gravimetric or Beta Attenuation	150 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		—		

Table 10.2 PM_{10} Sampling Network,

Abbreviation		CVA	DVN	ECA		ESC	OTM	DTN	KMA
Name		Chula Vista	Otay Mesa-Donovan	El Cajon		Escondido	Otay Mesa-Border Xing	San Diego-Beardsley	San Diego-Overland
Address		80 E. J St.	Donovan State Prision Rd.	1155 Redwood Ave.		600 E. Valley Pkwy	1100B Paseo International	1110A Beardsley St.	5555 Overland Ave.
Latitude		32° 37' 52" N	32° 34' 46" N	32° 47' 28" N		33° 07' 40" N	32° 33' 08" N	32° 42' 05" N	32° 50' 11" N
Longitude		117° 03' 33" W	116° 55' 46" W	116° 56' 32" W		117° 04' 31" W	116° 56' 16" W	117° 08' 59" W	117° 07' 43" W
AIRS ID		06 073 0001	06 073 1014	06 073 0003		06 073 1002	06 073 2007	06 073 1010	06 073 0006
PM_{10}	Monitor Designation	SLAMS	SLAMS	SLAMS[1]	SLAMS[2] NCore	SLAMS	SLAMS	SLAMS	SLAMS
	Sampling Method	SI	SI	SI	SQ	SI	SI	SI	SI
	Spatial Scale	NS	NS	NS	NS	NS	MI	NS	NS
	Monitoring Objective (Federal)	RC	RC	HC	HC	RC	IM	RC	RC
	Monitoring Objective (Local)								
	Analysis By	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD	**SDAPCD**	SDAPCD	**SDAPCD**
	Sampling Frequency	1:6, 24hrs	1:6, 24hrs	1:6, 24hrs	1:3, 24hrs	1:6, 24hrs	**1:6, 24hrs**	1:6, 24hrs	**1:6, 24hrs**
	Equipment Manufacturer/Model	Graseby Metal Works 2000H	Graseby Metal Works 2000H	Graseby Metal Works 2000H	Thermo 2025	Graseby Metal Works 2000H	Graseby Metal Works 2000H	Graseby Metal Works 2000H	Graseby Metal Works 2000H

GLOSSARY OF TERMS

Monitor Designation

PAMS	Photochemical Assessment Monitoring
SLAMS	State and Local Air Monitoring Stations
SPM	Special Purpose Monitoring
NCore	National Core
QA	Quality Assurance collocated
CSN	Chemical Speciation Network
STN	Speciation Trends Network
CSM	Community Scale Monitoring (SDAPCD)
CA TAC	California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

CL	Chemiluminescence
CT	Low volume, continuous sampler, size selective inlet
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
IPMS	Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale

MI	Micro Scale
MS	Middle 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] The PM_{10} (hi-vol) sampler at El Cajon was discontinued on 6/30/2011 to make room for the TSP-Pb sampler to satisfy new NCore requirements.

[2] The El Cajon station has a PM_{10} low flow sampler that is used in conjunction with the $PM_{2.5}$ low flow sampler to calculate PMcoarse (by the difference between the two samplers). The data is uploaded into AQS in both Local and Standard conditions.

Bold & Yellowed areas indicate a collocation of samplers to satisfy Federal requirements.
All sample times are set to PST.

Section 10.1.0 PM_{10} - Sampling Frequency

Requirements for the sampling frequency of monitors for pollutants are in the July 1, 2010 edition of 40 CFR Part 58-"Ambient Air Quality Surveillance", Section 58.12 "Operating Schedule". The actual sampling frequency is in Table 10.2.

> 1:1, 1:3, 1:6= Samplers that run every day (1), every three days (3), or every six (6) days, respectively, for a duration of 24 hours using a sample deposition media (filter). The filters are manually loaded, collected, and programmed to run sequentially on a weekly basis.

Section 10.2.0 PM_{10} Sampling Equipment

Table 10.3 PM_{10} Sampling Equipment, 2011

Pollutant	Abbreviation	Sampler	FRM or FEM Method	Reported Data Interval	Parameter Number	Method Code
Particulate Matter 10µm	PM_{10} (hi-vol)	Graseby Metal Works 2000H	Yes	24 Hour	81102	063
Particulate Matter 10µm	PM_{10} (lo-vol)	Thermo 2025	Yes	24 Hour	81102=STP	105
Particulate Matter 10µm	PM_{10} (lo-vol)	Thermo 2025	Yes	24 Hour	85101=LC	105

Section 10.3.0 PM_{10} Trend (Local/County)

PM_{10} concentrations do not correlate well to growth in population or vehicle usage, and high PM_{10} concentrations do not always occur in high population areas. Emissions from stationary sources and motor vehicles form secondary particles that contribute to PM_{10} in many areas. Over this period, the three-year average of the annual average shows a large decrease; however, there is a great deal of variability. Much of this variability may be due to meteorological conditions rather than changes in emissions.

In 2008, there were four exceedances of the annual limit at the Otay Mesa monitors. This site, which has been operational since February 1990, is located in the 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 Mexico. 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 along the California/Mexico border and handles the second highest volume of trucks along the U.S./Mexico border. Consequently, 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 events. In 2010, the monitors were reclassified with the spatial scale to Micro Scale and monitoring objective to Source Impact. The District plans to relocate this site.

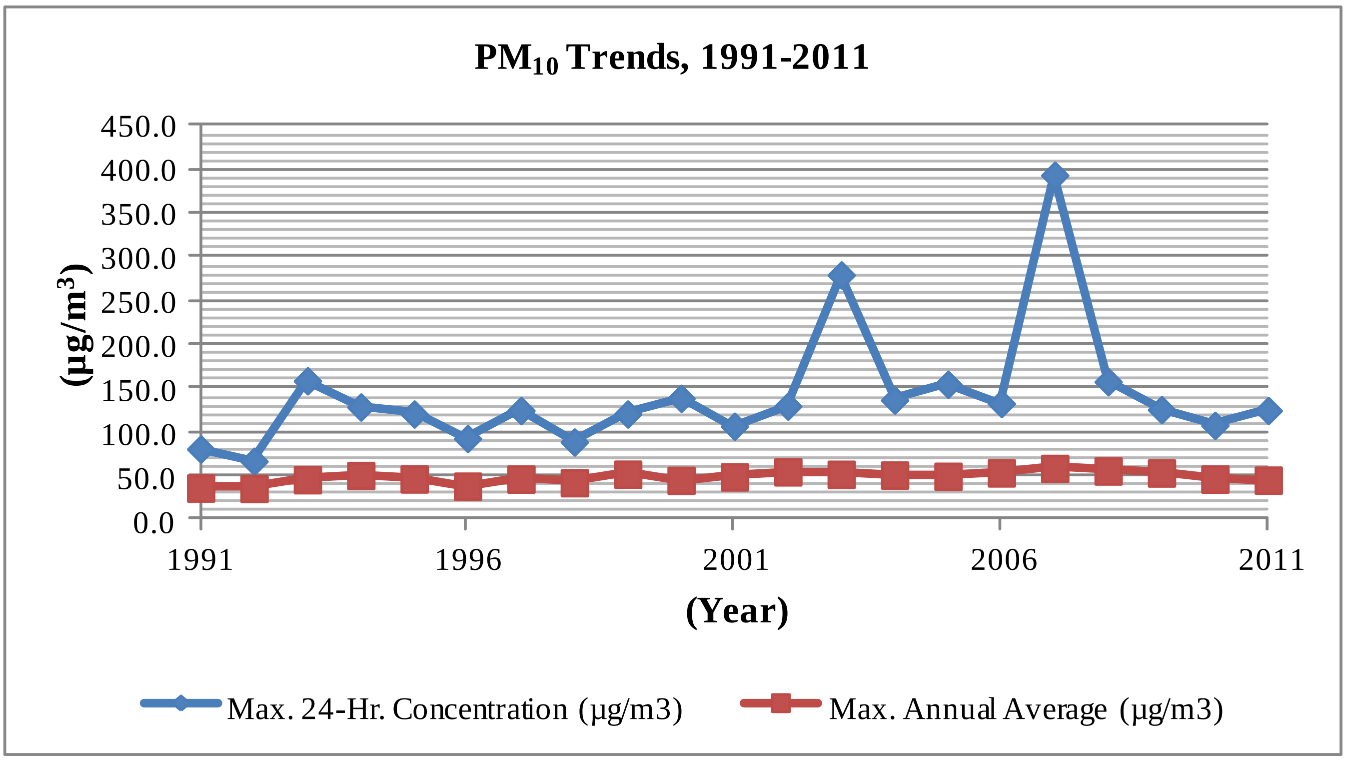
Due to the firestorms of 2003 and 2007, the annual average exceeded the National 24-hr standard. The firestorms are considered as exceptional events and they do not have a lasting impact in the SDAB. Exceptional events are tallied in the accounting for attainment/non-attainment status. Even with the last two firestorms, the County still qualifies for attainment status.

There is a substantial amount of variability from year-to-year in the 24-hour statistics. This variability is a reflection of meteorology, the sporadic nature of events such as wildfires, changes in monitoring locations, and the non-representative nature of PM_{10} data coming from the Otay Mesa border crossing (our highest contributor). The Otay Mesa values are not considered for the trends values. Please note, the "Days Above the Nat. 24-Hr Standard" row in Table 10.4 reflect the PM_{10} standard for that year.

Table 10.4 PM_{10} Summary of Concentrations for the Last 20 Years

PM_{10} (µg/m^3)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Max. 24-Hr. Concentration (µg/m^3)	81	67	159	129	121	93	125	89	121	139	107	130	280	137	155	133	394	158	126	108	125
Max. Annual Average (µg/m^3)	36.4	35.9	45.9	50.7	46.8	38.5	46.6	42.5	52.2	45.2	49.1	54.9	52.1	51.2	49.8	53.7	58.8	55.9	53.6	46.6	45.4
Calc Days Above Nat 24-Hr Std	0	0	2	0	0	0	0	0	0	0	0	0	1	0	1	0	2	1	0	0	0

Figure 10.2 PM_{10} Summary of Concentrations for the Last 20 Years Graph



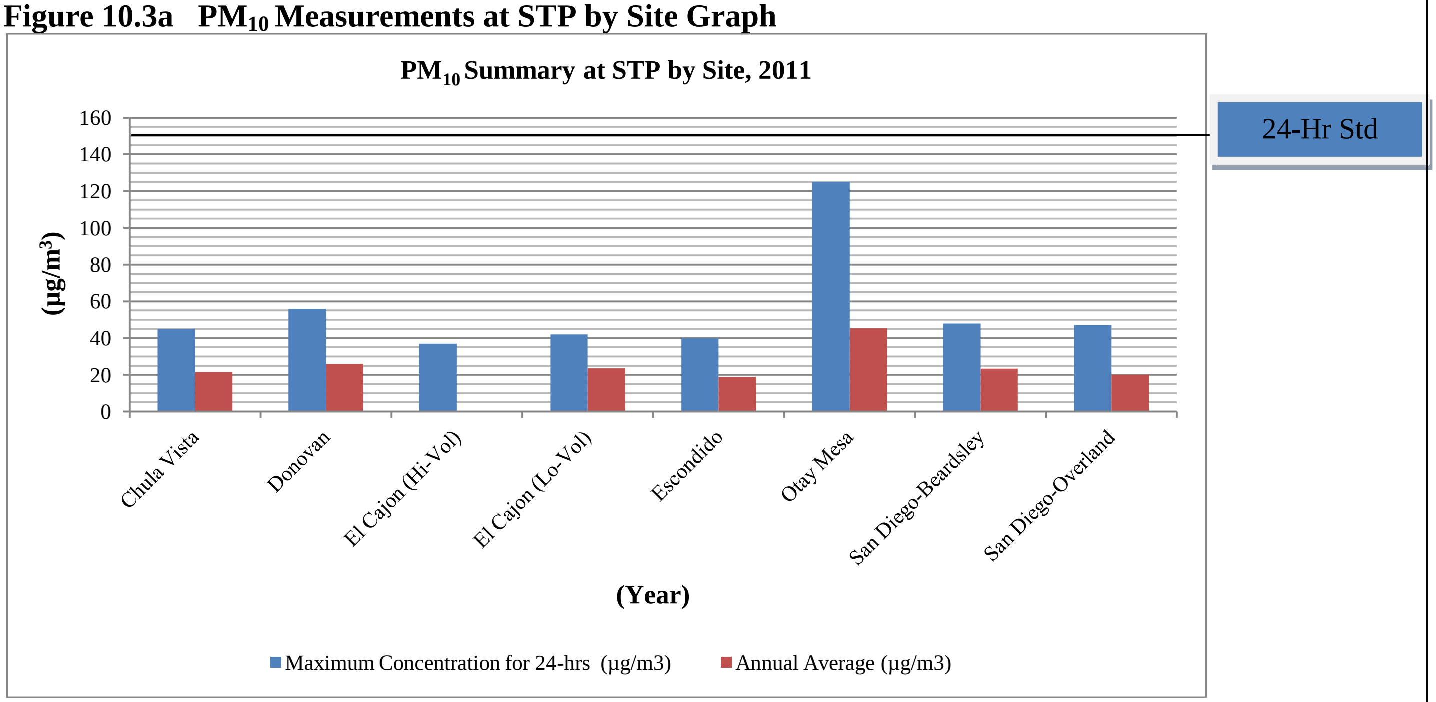
Section 10.4.0a PM_{10} Measurements at STP by Site

Table 10.5a PM_{10} Measurements at STP by Site

Location	Maximum Concentration for 24-hrs (µg/m³)	Number of Days Above the National Standard (#)	Annual Average (µg/m³)
Chula Vista	45	0	21.5
Donovan	56	0	26.0
El Cajon (Hi-Vol)	37	0	*
El Cajon (Lo-Vol)	42	0	23.5
Escondido	40	0	18.8
Otay Mesa	125	0	45.4
San Diego-Beardsley	48	0	23.3
San Diego-Overland	47	0	20.1
San Diego Air Basin Overall Average (with Otay Mesa)			24.7
San Diego Air Basin Overall Average (without Otay Mesa)			21.8

*Not sampled for an entire year.

Figure 10.3a PM_{10} Measurements at STP by Site Graph



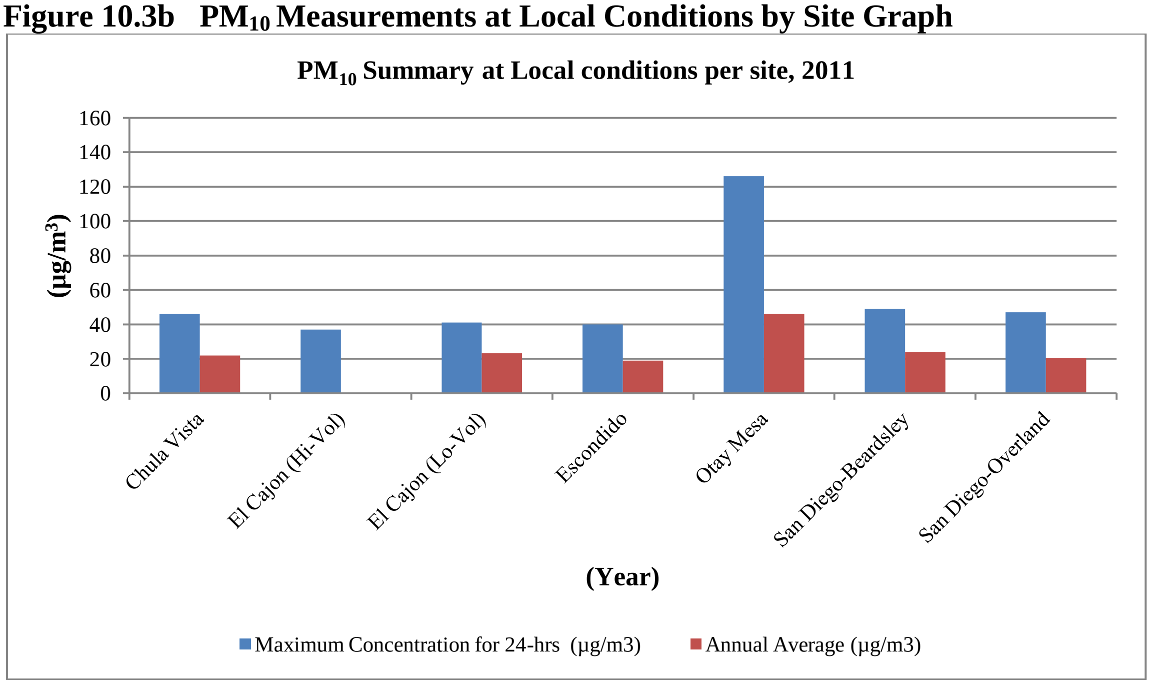
Section 10.4.0b PM_{10} Measurements at Local Conditions by Site

Table 10.5b PM_{10} Measurements at Local Conditions by Site

Location	Maximum Concentration for 24-hrs (µg/m^3)	Number of Days above the National Standard (#)	Annual Average (µg/m^3)
Chula Vista	46	0	22.0
Donovan	*	*	*
El Cajon (Hi-Vol)	37	0	**
El Cajon (Lo-Vol)	41	0	23.3
Escondido	40	0	18.9
Otay Mesa	126	0	46.0
San Diego-Beardsley	49	0	24.0
San Diego-Overland	47	0	20.4
San Diego Air Basin Overall Average (with Otay Mesa)			24.6
San Diego Air Basin Overall Average (without Otay Mesa)			21.1

* Data not available in Local conditions
**Not sampled for an entire year.

Figure 10.3b PM_{10} Measurements at Local Conditions by Site Graph



Section 10.5.0 PM_{10} Design Criteria Requirements from the Code of Federal Regulations

Requirements for the number of PM_{10} monitors are in 40 CFR Part 58-"Ambient Air Quality Surveillance", Subpart G-Federal Monitoring, Appendix D, Section 4-"Pollutant-Specific Design Criteria for SLAMS Sites". Please note, only the passages applicable to the SDAB have been cited. The requirements for PM_{10} are in subsection 4.6 and are referenced in this report in italics below.

4.6 Particulate Matter (PM_{10}) Design Criteria.
(a) Table D–4 indicates the approximate number of permanent stations required in MSAs to characterize national and regional PM_{10} air quality trends and geographical patterns. The number of PM_{10} stations in areas where MSA populations exceed 1,000,000 must be in the range from 2 to 10 stations, while in low population urban areas, no more than two stations are required. A range of monitoring stations is specified in Table D–4 because sources of pollutants and local control efforts can vary from one part of the country to another and therefore, some flexibility is allowed in selecting the actual number of stations in any one locale. Modifications from these PM_{10}monitoring requirements must be approved by the Regional Administrator.

Table D–4 of Appendix D to Part 58—PM_{10}Minimum Monitoring Requirements (Approximate Number of Stations Per MSA)[1]

Population category	***High concentration*** [2]	***Medium concentration*** [3]	***Low concentration*** [4,5]
>1,000,000	*6–10*	*4–8*	*2–4*
500,000–1,000,000	*4–8*	*2–4*	*1–2*
250,000–500,000	*3–4*	*1–2*	*0–1*
100,000–250,000	*1–2*	*0–1*	*0*

[1]*Selection of urban areas and actual numbers of stations per area will be jointly determined by EPA and the State agency.*

[2]*High concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding the PM_{10}NAAQS by 20 percent or more.*

[3]*Medium concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding 80 percent of the PM_{10}NAAQS.*

[4]*Low concentration areas are those for which ambient PM_{10} data show ambient concentrations less than 80 percent of the PM_{10}NAAQS.*

[5]*These minimum monitoring requirements apply in the absence of a design value.*

Section 10.5.1 PM_{10} Design Criteria for the SDAB Actual

Table 10.6a1 PM_{10} Sequential Samplers Daily (24-Hr) Design Data for the SDAB

Maximum Concentration (2011) (µg/m^3)	Is the Maximum Concentration Value < 80% of the NAAQS? (yes/no)	What is the Concentration Designation? (High/Medium/Low)	Meet NAAQS 2011 ? (yes/no)	Maximum Concentration Site (name)	Daily Design Value Site AQS ID (#)
56	Yes	Low	Yes	Donovan	06-073-1014

Table 10.6a2 PM_{10} Sequential Samplers Design Criteria for the Minimum Number of Samplers Needed

MSA (name)	County (name)	2011 Population from 2010 Census (#)	Minimum Number of Sequential Samplers Required (#)	Number of Active Sequential Samplers (#)	Number of Sequential Samplers Needed (#)	Site of Expected Maximum Concentration (name)	Site of Expected Maximum Concentration AQS ID (#)
San Diego	San Diego	3.2 million	2 – 4 (Low Concentration)	6*	None	Donovan	06-073-1014

***** Measurements at the Otay Mesa 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.)

Section 10.6.0 PM_{10} Quality Control Practices for the Network

The requirements for Quality Control of criteria pollutants are in 40 CFR Part 50 and Part 58. Each criteria pollutant has a specific section. See Table 10.8a and Table 10.8b for the specific references and equipment.

The District utilizes a PM_{10} transfer standard that is certified annually by the CARB laboratory. This transfer standard is used to calibrate the hi-vol PM_{10} samplers in the network

Table 10.7a PM_{10} QC Measures

	Quality Control Measures (Field)	
	Calibration	Flow Rate Verification
Frequency	Every site twice a year and 50% per quarter*	Every 4 Weeks
Personnel	By personnel who do not perform the audits	By site operator
Reference (Field)	40 CFR Part 50, App. J	40 CFR Part 58, App. A, Sections 3.2.3 & 3.3.2
Equipment Used (Calibrator)	With Variable Flow Rate instrumentation, thermocouple, manometer, and barometric pressure sensor used for calibrations only	With Variable Flow Rate instrumentation, thermocouple, manometer, and barometric pressure sensor used for verifications only
Certifications	Field Equipment = 1/yr	Field Equipment = 1/yr

**twice the minimum frequency

Table 10.7b PM_{10} QC Measures for the Laboratory

Quality Control Measures (Laboratory)		
Equipment	Reference	Frequency
Filter Conditioning Environment	40 CFR Part 50, Appendix G, sections 7.4 & 9.3	All filters
Filters	Quality Assurance Guidance Document 2.11, Section 4.2	All filters
Filter Weighings	Quality Assurance Guidance Document 2.11, Section 4.5	Within 30 days

Section 10.7.0 PM_{10} Quality Assurance (QA) Practices for the Network

The requirements for the Quality Assurance of the criteria pollutants are in the 40 CFR Part 58. Each criteria pollutant has a specific section. See Table 10.9a and 10.9b for the specific references and equipment.

The District utilizes a PM_{10} transfer standard that is certified annually by the ARB laboratory. This transfer standard is used to audit the Hi-Vol PM_{10} samplers in the network

Table 10.8a PM_{10} QA Measures

	Quality Assurance Measures (Field)		
	Internal Local (District) Audits	Collocation	External State (ARB) Audits
Frequency	Every site 2/year= 50% sites/quarter	Same frequency and time as the primary sampler	75% of the monitors/year randomly selected
Personnel	With personnel who do not perform the calibrations	n/a	Manually performed by randomly selected personnel
Reference (Field)	40 CFR Part 58 App. A, Section 3.2.4	40 CFR Part 58 App. A, Section 3.3.1	n/a
Equipment Used (Field)	With a Flow Transfer Standard, Voltmeter, Manometer, and Thermocouple used for audits only	Same equipment as the primary sampler	With a Flow Transfer Standard, Voltmeter, Manometer, and Thermocouple
Certifications	Field Equipment = 1/yr	Field Equipment = 1/yr	See ARB
Equipment Used (Filter Media)	Quality Assurance Guidance Document 2.12 Sections 7 & 9	Quality Assurance Guidance Document 2.12 Sections 7 & 9	n/a
Certifications	n/a	n/a	n/a

Table 10.8b PM_{10} QA Measures for the Laboratory

Quality Assurance Measures (Laboratory)		
Equipment	Reference	Frequency
Temperature & Relative Humidity	n/a	Quarterly
Balance	Quality Assurance Guidance Document 2.11 (Table 7-1)	Yearly
Primary Standards	Quality Assurance Guidance Document 2.11 Section 9	Yearly

Section 10.7.1 PM_{10} Quality Assurance (QA) Collocation Requirements for the Network

According to the CFR, for each network of manual PM_{10} methods, select 15 percent (or at least one) of the monitoring sites within the primary quality assurance organization for collocated sampling, Table 10.10. All non-collocated monitors/samplers are called "main" and have the designation as primary.

Table 10.9 PM_{10} Quality Assurance Collocation Requirements for the Network

Main Monitors			Collocated Monitors				
Minimum Number of Sequential Samplers Required (#)	Number of Active Primary Monitors (#)	Number of Monitors Needed (#)	Number of Monitors Needed for Collocation = 15% x Minimum Number of Sites Required for Sequential Samplers Rounded Up (#)	Number of Active Monitors Used for Collocation (#)	Number of Monitors Needed (#)	Location of Collocated Site (name)	AQS ID (#)
2 - 4	7	None	4 x (15%) = 1	1*	none	San Diego-Overland	06-073-0006

* The District has two sets of collocated monitors. One set is at the Overland location. When the Overland location is shut down, that set of the collocated monitors will be sited at the new Kearny Villa Road (KVR) location. The second set of collocated monitors is at the Otay Mesa location. Since these monitors are source impacted by the border crossing, the measured values have not been compared to the NAAQS and the accuracy data has not been used. The District still meets the minimum collocation requirement of 1 set of collocated monitors.

Section 10.8.0 PM_{10} – Changes to the Network

Any official decommissioning of any monitor or monitoring location will be proposed in a letter with accompanying documentation to the EPA and, when appropriate, the ARB. Also, parallel sampling between the new location and the old location will be undertaken, when possible.

Note, some monitoring stations are being relocated due to tenancy issues.

Section 10.8.1 PM_{10} – Changes to the Design Criteria Requirements from the Code of Federal Regulations

The PM_{10} design criteria applicable to calendar year (CY) 2013 have not changed, so the information in Section 10.5 will apply to CY 2013.

Section 10.8.2 PM_{10} Changes to the Equipment

None

Section 10.8.2 PM_{10} Changes to the Sampling Locations

San Diego-Overland

Due to tenancy issues, the District relocated the San Diego-Overland (KMA) site in Kearny Mesa to a new location off Kearny Villa Road (KVR) in the 1st Qtr of 2012. Since late 2010, O_3 has been collected in parallel at KVR with the KMA location. In late 2011, NOx has been collected in parallel at the KVR location with the KMA location (the District does not have the resources to run parallel sampling for the other pollutants at the KVR site). The new station houses O_3, NOx, PM_{10} (plus a collocated sampler), $PM_{2.5}$-Sequential (non-speciated, plus a collocated sampler), PAMS-Carbonyl equipment, and meteorological equipment.

El Cajon Station

Per approval from the EPA, the PM_{10} (hi-vol) sampler was decommissioned on June 30, 2011. With the NCore requirement to sample for PM_{coarse}, a pair of PM (low volume) samplers are used in parallel to collect PM_{10} (lo-vol) and $PM_{2.5}$. PM_{coarse} is calculated by subtracting the $PM_{2.5}$ concentrations from the PM_{10} concentrations. The resulting rooftop space available will allow the District to place a TSP sampler for lead analysis.

Otay Mesa Station

The North American Free Trade Agreement (NAFTA) greatly increased the heavy truck traffic at the Otay Mesa border crossing. It is now the second busiest commercial border crossing in the United States. This, coupled with the projected increase from a pending second Point of Entry at the Otay Mesa border crossing, has forced the re-designation of the Otay Mesa station instruments from Neighborhood Scale to MicroScale and Impact levels. Also, the District will be forced out of this location in FY 2012-2013. This station has O_3, NOx, PM_{10}, meteorological equipment, and XonTechs 924 & 910A-Fused Silica Lined samplers for Toxics sampling. CO was decommissioned in the 1st Quarter of 2010 and SO_2 decommissioned in the 2nd Quarter of 2011. The SDAPCD requested and was granted approval to decommission the PM_{10} samplers at the Otay Mesa Border Crossing. The paired PM_{10} samplers were decommissioned on June 30, 2012.

Section 11.0.0 National Core (NCore) Introduction

National Core (NCore) is a multi-pollutant network that integrates several advanced measurement systems for particles, as well as pollutant gases with the existing equipment for a Photochemical Assessment Monitoring Station (PAMS). The EPA designated the El Cajon station (Figure 11.1) as the NCore site for the SDAB, so additional instrumentation, PM_{coarse} (calculated values from paired PM_{10} & $PM_{2.5}$ Low Volume samplers), CO (trace level), SO_2 (trace level), and NOy (total reactive Nitrogen Oxides) was added at the start of 2011. In December, 2011, a Lead-TSP (Pb-TSP) sampler was added to satisfy a recent addition to the list of NCore requirements.

The criteria gaseous pollutants for trace, ambient, and total levels, are referenced to ambient standards from the NAAQS Standards of 2011 (Table 11.1). The sampling equipment are listed in Tables 11.2 and 11.3.

Figure 11.1 NCore Network Map

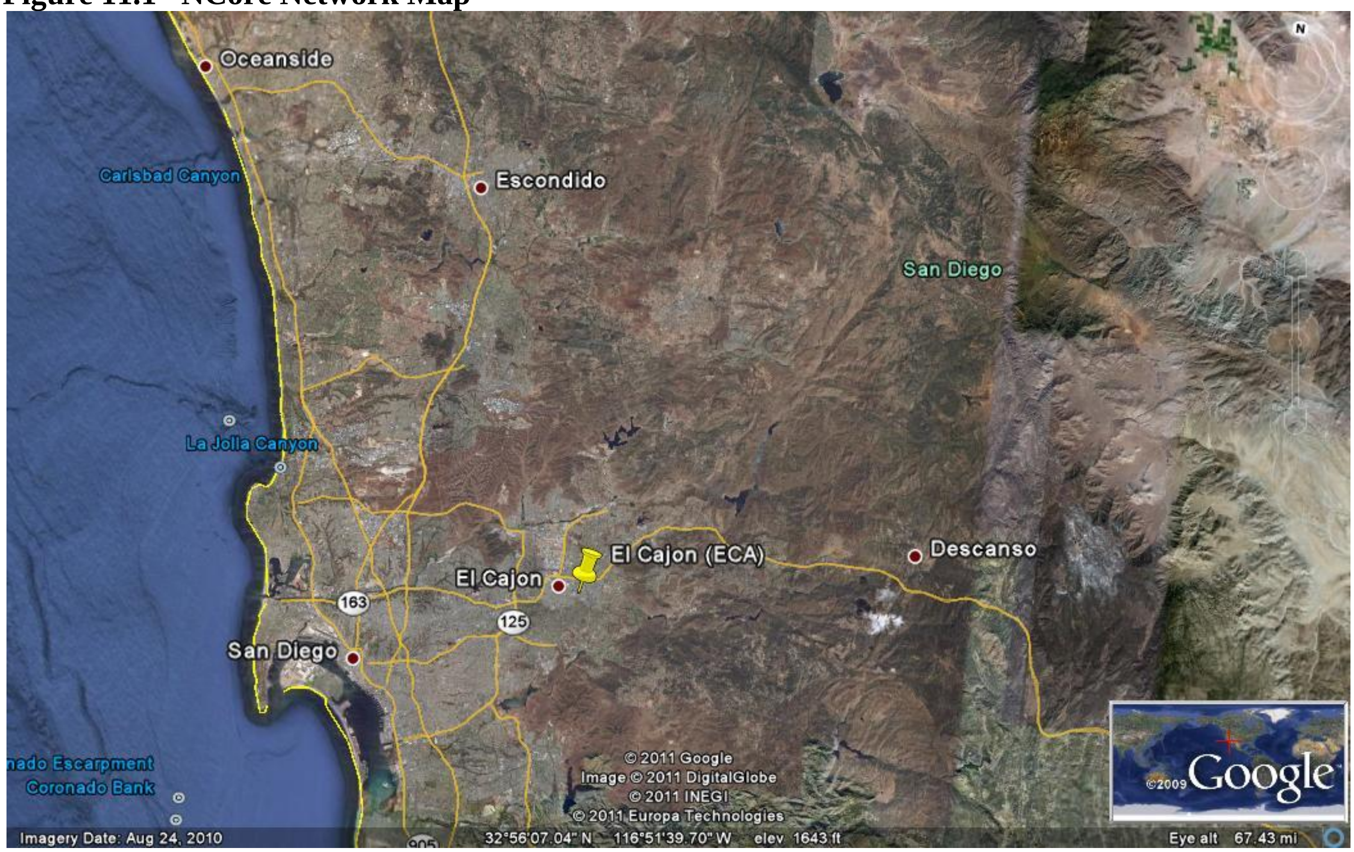


Table 11.1 NCore Pollutants State and Federal Standards for the Year

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15.0 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	Gas Phase Chemiluminescence	53 ppb (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3)	None	
Sulfur Dioxide (SO_2)	24 Hour	0.04 ppm (105 µg/m^3)	Ultraviolet Fluorescence	—	—	Ultraviolet Flourescence; Spectrophotometry
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	1 Hour	0.25 ppm (655 µg/m^3)		75 ppb (196 µg/m^3)	—	
Lead	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average	—		0.15 µg/m^3		

Table 11.2 NCore Samplers

Parameter	Type	Monitor Designation	Sampling Method	Spatial Scale	Monitoring Objective (federal)	Monitoring Objective (local)	Equipment Ownership	Sampling Frequency	Equipment Manufacturer
O_3	(Ambient)	PAMS, SLAMS, NCore	UV	NS	RC	Burn	APCD	7 / 24	Thermo 49
CO -T.L.E.	(Trace Level)	NCore	IR	NS	RC		APCD	7 / 24	Thermo 48i - TLE
SO_2 -T.L.E.	(Trace Level)	NCore	FL	NS	RC		APCD	7 / 24	Thermo 43i - TLE
NOy	(Total Reactive Nitrogen)	NCore	CL	NS	RC		APCD	7 / 24	Thermo 42i - NOy
Pb	Lead - (Total Suspended Particulate)	NCore	IPMS	NS	RC		APCD	1:6	Tisch TE-5170BLVFC+
PM_{10}	(lo-vol)	SLAMS, NCore	SQ	NS	HC		APCD	1:3	Thermo 2025
	(hi-vol)	SLAMS	SI	NS	HC		APCD	1:6	Graseby Metal Works 2000H
$PM_{2.5}$	(non-FEM) (continuous)	SLAMS, NCore	CT	NS	RC		APCD	7 / 24	Met One BAMS 1020
	(FRM) (sequential)	SLAMS, NCore	SQ	NS	RC		APCD	1:3	Thermo 2025
PM_{coarse}*	PM_{10} - $PM_{2.5}$ (FRM) (sequential)	NCore	SQ	NS	RC		APCD	1:3	Thermo 2025
CSN	$PM_{2.5}$ - Carbon (sequential)	SLAMS, CSN, NCore	SP	NS	RC		EPA	1:6	University Research Glassware 3000N
STN	$PM_{2.5}$ - Metals (simultaneous)	SLAMS, CSN, NCore	SP	NS	RC		EPA	1:6	Met One SASS
	$PM_{2.5}$ - Inorganics-Ions (simultaneous)	SLAMS, CSN, NCore	SP	NS	RC		EPA	1:6	Met One SASS
Meterological Equipment	External temperature	PAMS, NCore					APCD	7 / 24	Rotronics
	% Relative humidity	PAMS, NCore					APCD	7 / 24	Rotronics
	Wind speed/wind direction	PAMS, NCore					APCD	7 / 24	Qualimetrics

GLOSSARY OF TERMS

Monitor Designation

PAMS	Photochemical Assessment Monitoring
SLAMS	State and Local Air Monitoring Stations
SPM	Special Purpose Monitoring
NCore	National Core
QA	Quality Assurance collocated
CSN	Chemical Speciation Network
STN	Speciation Trends Network
CSM	Community Scale Monitoring (SDAPCD)
CA TAC	California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

CL	Chemiluminescence
CT	Low volume, continuous sampler, size selective inlet
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
IPMS	Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale

MI	Micro Scale
MS	Middle 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

*PM_{coarse} is calculated via the subtraction of $PM_{2.5}$ from PM_{10}.

Section 11.1.0 NCore – Sampling Frequency

Requirements for the sampling frequency of monitors for NCore pollutants are the same as for ambient level pollutants. They can be found in the July 1, 2010 edition of 40 CFR Part 58-"Ambient Air Quality Surveillance", Subpart B, Section 58.12 "Operating Schedules".

Sampling frequencies are designated as follows:

7 / 24= gaseous pollutants that samples continually with no media changes needed (7 days a week / 24 hours a day), O3, CO-TLE, NOy, $PM_{2.5}$-FEM, and surface meteorology.

1:3= a sampler that requires a sample deposition media (filter); it runs every three (3) days for a duration of 24 hours. The filters are manually loaded, collected, and programmed to run weekly, PM $_{2.5}$-FRM, PM_{10}-FRM, $PM_{2.5}$ Speciation, $PM_{2.5}$ Carbon.

1:6= a sampler that requires a sample deposition media (filter); it runs every six (6) days for a duration of 24 hours. The filters are manually loaded, collected, and programmed to run weekly, Pb-TSP.

Section 11.2.0 NCore Sampling Equipment

Table 11.3 NCore Sampling Equipment

Pollutant	Abbreviation	Sampler	FRM or FEM	Analytical Method	Reported Data Interval	Parameter Number	Method Code
Ozone	O_3	Thermo 49	FRM	Ultraviolet	1 Hour	44201	047
Carbon Monoxide	CO-TLE	Thermo 48i Trace Level	FRM	Nondispersive Infared	1 Hour	42101	554
Sulfur Dioxide	SO_2-TLE	Thermo 43i Trace Level	FRM	Fluorescence	1 Hour	42401	560
Total reactive Nitrogen	NOy	Thermo 42i	n/a	Chemiluminescence	1 Hour	46202	574
Particulate Matter 2.5 $\mu g/m^3$	$PM_{2.5}$	Thermo 2025	FRM	Manual Reference collection Method utilizing gravimetric analysis	24 hrs	88101	105
Particulate Matter 10 $\mu g/m^3$	PM_{10}	Thermo 2025	FRM	Manual Reference collection Method utilizing gravimetric analysis	24 hrs	85101	105
Particulate Matter (10 - 2.5) $\mu g/m^3$	PM_{COARSE} (calculated via subtraction)	Thermo 2025	FRM	Manual Reference collection Method utilizing differential gravimetric analysis	24 hrs	86101	105
Lead	Pb	Tisch TE-5170BL VFC+	FRM	Manual Reference collection Method utilizing ICP-MS	24 hr	14129	192
Particulate Matter 2.5 $\mu g/m^3$	$PM_{2.5}$	MetOne FEM BAM	FEM	Automated Method using Beta particle attenuation	1 hr	88101	170
Metals & Inorganics	$PM_{2.5}$ Speciation	MetOne SASS	n/a	Manual method using ion chromatography, gravimetric, and X-ray fluorescence	24 hrs	n/a	n/a
Speciated Carbon	$PM_{2.5}$ Carbon	URG-3000N	n/a	Manual method using thermal-optical method	24 hrs	n/a	n/a
Surface Meteorology	Wind Speed, Wind Direction, Temperature, % Rel. Humidity	Qualimetrics, Qualimetrics, Rotronics, Rotronics	n/a	n/a	1 Hour	n/a	n/a

Section 11.3.0 NCore Trend (Local/County)

Please note, because the NCore program is a startup program for 2011, there are no trends data to report; only 2011 data. The instrumentation needed for NCore designation are, PMcoarse (calculated values from paired PM_{10} & $PM_{2.5}$ Low Volume samplers), CO (trace level), SO_2 (trace level), NOy (total reactive Nitrogen Oxides), and Pb-TSP (not operational until the 1st Qtr of 2012).

Table 11.4a NCore PMcoarse Concentrations

PMcoarse (µg/m^3)	2011
Max. 24-Hr. Concentration	30.7
98th Percentile of 24-Hr Conc.	24.8
Avg. of Qtrly. Means	13.2

Table 11.4b NCore CO-TLE Concentrations

CARBON MONOXIDE (ppm)	2011
Max. 1-Hr. Concentration	1.8
Max. 8-Hr. Concentration	1.3

Table 11.4c NCore SO_2-TLE Concentrations

SULFUR DIOXIDE (ppm)	2011
Max 1-Hr SO_2	0.001
Max 24-Hr SO_2	0.001
Annual Avg. SO_2	0.000

Table 11.4d NCore NOy Concentrations

*NOy - NO (ppm)	2011
Max. 1-Hr. Concentration	0.048
Annual Average	0.012

*Please note, as yet, NOy does not have FRM or FEM designation and cannot be compared to the NO_2 NAAQS.

Table 11.4e NCore Pb Concentrations

LEAD (µg/m^3)	2011
Average of the Calendar quarter	*
Rolling 3-Month Average	*

*Lead sampling sites were constructed, but not operational in 2011

Section 11.4.0 NCore Design Criteria Requirements from the Code of Federal Regulations

Requirements for the numbers of monitors for the NCore pollutants are in the July 1, 2010 edition of 40 CFR Part 58-"Ambient Air Quality Surveillance", Subpart G-"Federal Monitoring", Appendix D, Section 3–"Design Criteria for NCore Sites" and are referenced in this report. Please note, only the passages applicable to the SDAB have been cited.

3. Design Criteria for NCore Sites

(b) The NCore sites must measure, at a minimum, $PM_{2.5}$ particle mass using continuous and integrated/filter-based samplers, speciated $PM_{2.5}$, $PM_{10–2.5}$ particle mass, speciated $PM_{10–2.5}$, O_3, SO_2, CO, NO/NO_y, wind speed, wind direction, relative humidity, and ambient temperature. NCore sites in CBSA with a population of 500,000 people (as determined in the latest Census) or greater shall also measure Pb either as Pb-TSP or Pb-PM_{10}. The EPA Regional Administrator may approve an alternative location for the Pb measurement where the alternative location would be more appropriate for logistical reasons and the measurement would provide data on typical Pb concentrations in the CBSA.

Section 11.4.1 NCore Design Criteria for the SDAB Actual

NCore Design requirements are based upon EPA designations and are population-based. San Diego meets those requirements. The NCore program requirements are in the July 1, 2010 edition of the 40 CFR Part 58-Ambient Air Quality Surveillance, Subpart G-Federal Monitoring, Appendix D, Section 3-Design Criteria for NCore sites. Tables 11.5a and b summarizes the NCore Design Criteria specifically for the SDAB.

Table 11.5a NCore Design Value Minimum Number of Sites Required

MSA	County	Population (2011) (#)	Minimum Number of Sites Required (#)	Number of Active Sites (#)	Number of Sites Needed
San Diego	San Diego	3.2 million	1	1	None

Table 11.5b NCore Design Value for the Minimum Number of Monitors Needed

Parameter	O_3	CO T.L.E.	SO_2 T.L.E.	NOy	Pb-TSP	$PM_{2.5}$ FRM (lo-vol, sequential)	$PM_{2.5}$ FEM (lo-vol, continuous)	PMcoarse	$PM_{2.5}$ STN (lo-vol, speciated/Ions)	$PM_{2.5}$ (lo-vol, speciated/Carbon)	Wind Speed/ Wind Direction/ External Temperature/ % Relative Humidity
Mininum Number of Monitors Required	1	1	1	1	1	1	1	1	1	1	1
Number of Active Monitors	1	1	1	1	1	1	1	1	1	1	1
Number of Monitors Needed	None	None	None	None	None	None	None	None	None	None	None

Section 11.5.0 NCore Quality Control (QC)

Requirements for Quality Control of the monitors are in 40 CFR Parts 50 add 58 and the NCore Technical Assistance Document (TAD). Table 11.6 has the specific references and equipment.

Table 11.6 NCore QC Measures

Quality Control Measures					
Pollutant		Calibration	Flow Rate Verification		
Pb-TSP		See Lead Section 8.6	See Lead Section 8.6		
Particulate Matter 10 - 2.5 µg/m^3 ($PM_{2.5}$, PM_{10} & PM_{COARSE})		See $PM_{2.5}$ Section 9.6	See $PM_{2.5}$ Section 9.6		
Particulate Matter 10 µg/m^3 (PM_{10}, Hi-Vol)		See $PM_{2.5}$ Section 10.6	See $PM_{2.5}$ Section 10.6		
Speciated Carbon ($PM_{2.5}$ Carbon)		See $PM_{2.5}$ Section 9.6	See $PM_{2.5}$ Section 9.6		
$PM_{2.5}$ Speciation (Metals & Inorganics)		See $PM_{2.5}$ Section 9.6	See $PM_{2.5}$ Section 9.6		
Surface Meteorology (Wind speed & direction, Temp., %Relative Humidity)		Quality Assurance Handbook for Air Volume IV: Meteorological Measurements Ver. 2.0 Pollution Measurement Systems	n/a		
Pollutant		Calibration	Zero/Span	Precision Checks	Method Detection Limits
Ozone (O_3)		See Ozone *** Section 4.6	See Ozone Section 4.6	See Ozone*** Section 4.6	n/a
Carbon Monoxide (CO-TLE)	Frequency	Every quarter	Zeroes = Every 2 days Spans = Every 4 days	Every 4 days	Annually or if the instrument underwent major repairs
	Personnel	manually performed by personnel who do not perform	automated	automated	manually performed by personnel who do not perform
	Reference	See NCore TAD Sections 2.6.1 & 2.7.2	See NCore TAD Section 2.7.3	See NCore TAD Section 2.7.4	See NCore TAD Section 2.3.1.6
Sulfur Dioxide (SO_2-TLE)	Frequency	Every quarter	Zeroes = Every 2 days Spans = Every 4 days	Every 4 days	Annually or if the instrument underwent major repairs
	Personnel	manually performed by personnel who do not perform	automated	automated	manually performed by personnel who do not perform
	Reference	See NCore TAD Sections 3.6.1 & 3.7.2	See NCore TAD Section 3.7.3	See NCore TAD Section 3.7.4	See NCore TAD Section 3.3.1.6
Total reactive Nitrogens (NOy)	Frequency	Every quarter	Zeroes = Every 2 days Spans = Every 4 days	Every 4 days	Annually or if the instrument underwent major repairs
	Personnel	manually performed by personnel who do not perform	automated	automated	manually performed by personnel who do not perform
	Reference	See NCore TAD Sections 4.6.1 & 4.7.2	See NCore TAD Section 4.7.3	See NCore TAD Section 4.7.4	See NCore TAD Section 4.3.1.6
Equipment used-automated (Calibrator)		with Level 1 Dynamic Dilution Instrumentation used for calibrations, precision checks, Zeroes & Spans only, specific to that station	with Level 1 Dynamic Dilution Instrumentation used for calibrations, precision checks, Zeroes & Spans only, specific to that station	with Level 1 Dynamic Dilution Instrumentation used for calibrations, precision checks, Zeroes & Spans only, specific to that station	with Level 1 Dynamic Dilution Instrumentation used for calibrations, precision checks, Zeroes & Spans only, specific to that station
Diluent used (Zero Air Generator)		Zero Air Generator specific to that station	Zero Air Generator specific to that station	Zero Air Generator specific to that station	Zero Air Generator specific to that station
Certifications		Calibrator= 4/yr Transfer Std= 4/yr Zero Air Generator=**	Calibrator= 4/yr Transfer Std= 4/yr Zero Air Generator=**	Calibrator= 4/yr Transfer Std= 4/yr Zero Air Generator=**	Calibrator= 4/yr Transfer Std= 4/yr Zero Air Generator=**

**With the lower LDLs of the newer monitors, the District is in the process of developing a procedure to test the quality of the delivered air by the zero air generators.

***Ozone is calibrated and precision checked with a level 1 Dynamic Dilution Instrumentation that is external to the station. That equipment is recertified semi-annually.

Section 11.7.0 NCore Quality Assurance (QA) Practices for the Network

Requirements for Quality Assurance of the NCore pollutants are in 40 CFR Part 58. Each criteria pollutant has a specific section. See Table 11.7 for the specific references and equipment.

Table 11.7 NCore QA Measures

Quality Assurance Measures					
Pollutant		Internal Local Audits (District)	External State Audits (ARB)	Collocation	
Pb-TSP		Pb Section 8.7	Pb Section 8.7	Pb Section 8.7	
Particulate Matter 2.5 µg/m^3 ($PM_{2.5}$)		$PM_{2.5}$ Section 9.7	$PM_{2.5}$ Section 9.7	$PM_{2.5}$ Section 9.7	
Particulate Matter 10 µg/m^3 (PM_{10})		PM_{10} Section 10.7	PM_{10} Section 10.7	PM_{10} Section 10.7	
Particulate Matter 10 - 2.5 µg/m^3 (PM_{COARSE})		n/a	n/a	n/a	
Particulate Matter 2.5 µg/m^3 ($PM_{2.5}$)		$PM_{2.5}$ Section 9.7	$PM_{2.5}$ Section 9.7	$PM_{2.5}$ Section 9.7	
Speciated Carbon ($PM_{2.5}$ Carbon)		$PM_{2.5}$ Section 9.7	$PM_{2.5}$ Section 9.7	$PM_{2.5}$ Section 9.7	
$PM_{2.5}$ Speciation (Metals & Inorganics)		$PM_{2.5}$ Section 9.7	$PM_{2.5}$ Section 9.7	$PM_{2.5}$ Section 9.7	
Surface Meteorology (Wind Speed, Wind Direction, Temperature, %Relative Humidity)		Quality Assurance Handbook for Air, Volume IV: Meteorological Measurement Version 2.0 Pollution Measurement Systems	Quality Assurance Handbook for Air, Volume IV: Meteorological Measurement Version 2.0 Pollution Measurement Systems	Quality Assurance Handbook for Air, Volume IV: Meteorological Measurement Version 2.0 Pollution Measurement Systems	
Pollutant		Internal Local Audits (District)	External Federal (NPAP) Audits	External State Audits (ARB)	Method Detection Limits
Ozone (O_3)		See Ozone, Section 4.7	n/a	Once a year	n/a
Carbon Monoxide (CO-TLE)	Frequency	Every quarter	See EPA	See ARB	Annually or if the instrument underwent major repairs
	Personnel	With personnel who do not perform the calibrations	See EPA	Manually performed by randomly selecter personnel	manually performed by personnel who do not perform
	Reference	40 CFR Part 58 App. A	See NCore TAD 5.4.1	n/a	See NCore TAD Section 2.3.1.6
Sulfur Dioxide (SO_2-TLE)	Frequency	Every quarter	See EPA	See ARB	Annually or if the instrument underwent major repairs
	Personnel	With personnel who do not perform the calibrations	See EPA	Manually performed by randomly selecter personnel	manually performed by personnel who do not perform
	Reference	40 CFR Part 58 App. A	See NCore TAD 5.4.1	n/a	See NCore TAD Section 3.3.1.6
Total reactive Nitrogens (NOy)	Frequency	Every quarter	See EPA	See ARB	Annually or if the instrument underwent major repairs
	Personnel	With personnel who do not perform the calibrations	See EPA	Manually performed by randomly selecter personnel	manually performed by personnel who do not perform the audits
	Reference	40 CFR Part 58 App. A	See NCore TAD 5.4.1	n/a	See NCore TAD Section 4.3.1.6
Equipment used-automated (Calibrator)		With Level 1 Dynamic Dilution Instrumentation used audits only	With Level 1 Dynamic Dilution Instrumentation used audits only	With Level 1 Dynamic Dilution Instrumentation used audits only	with Level 1 Dynamic Dilution Instrumentation used for calibrations, precision checks,
Diluent used (Zero Air Generator)		Zero Air Generator used for calibrations & precision checks	With external Zero air generator	With external Zero air generator	Zero Air Generator specific to that station
Certifications		Calibrator= 4/yr Transfer Std= 4/yr Zero Air Generator=*	See EPA	See ARB	Calibrator= 4/yr Transfer Std= 4/yr Zero Air Generator=*

*With the LDLs of the newer monitors lower than a cylinder of air, the District is in the process of developing a procedure to test the quality of the delivered air by using a zero air generator.

Section 11.8.0 NCore Changes to the Network

Any official decommissioning of any monitor or monitoring location will be proposed in a letter with accompanying documentation to the EPA.

Section 11.8.1 NCore Changes to the Design Criteria Requirements from the Code of Federal Regulations

The NCore design criteria applicable to calendar year (CY) 2013 have not changed., so the information in Section 11.5.0 will apply to CY 2013.

Section 11.8.2 NCore Changes to the Equipment

None

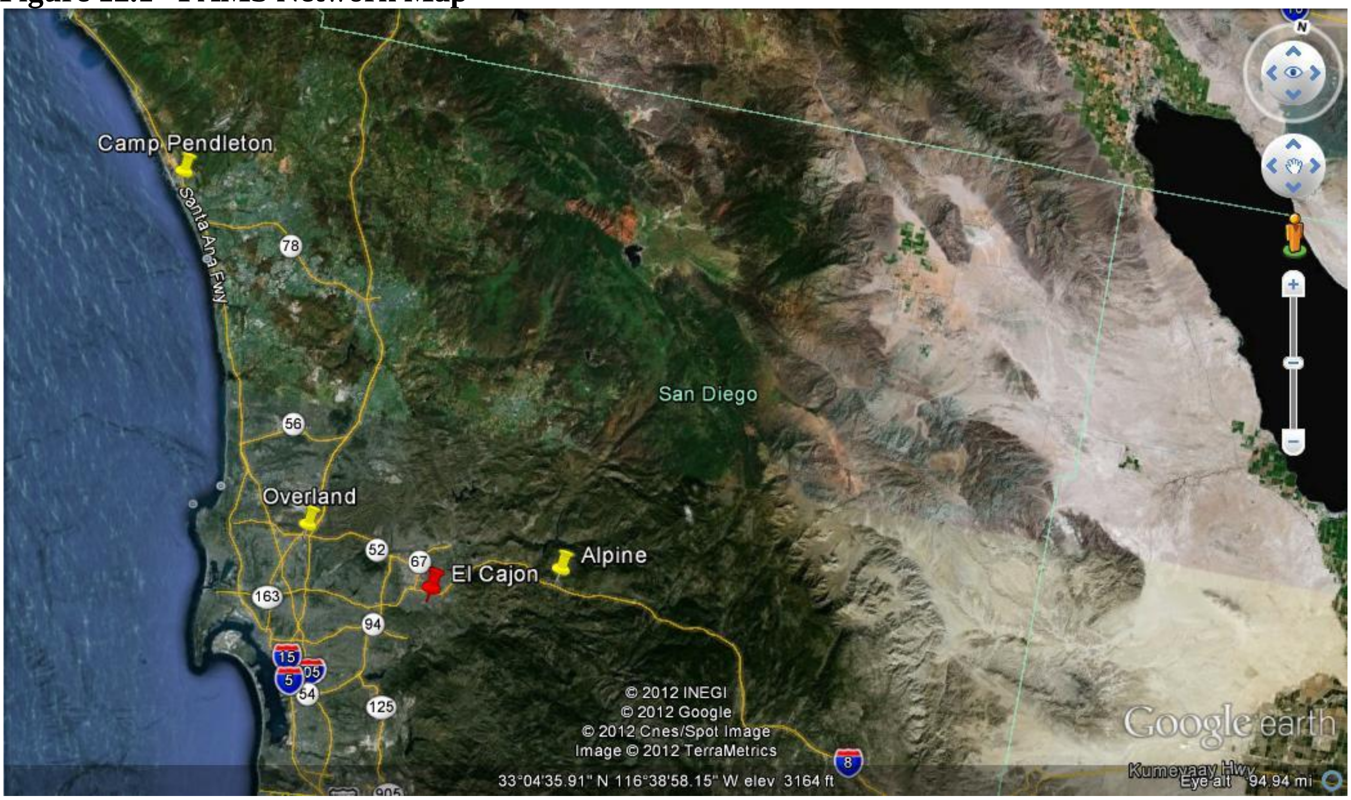
Section 11.8.3 NCore Changes to the Sampling Location

There is a possibility that the NCore site may have to be relocated in CY 2013. The grounds the NCore station resides on is due for remodeling by the El Cajon School District. When this happens, the District will endeavor to situate a parallel station at the new location, if funds and time allow. If this is not possible, a temporary closure of the station will occur, per EPA Region IX's recommendation and then monitoring will resume once a new nearby location has been secured.

Section 12.0.0 Photochemical Assessment Monitoring Stations (PAMS) Introduction

For 2011, PAMS-related sampling was conducted at four sites (see Figure 12.1). As yet, there are no NAAQS standards to compare the data. PAMS-VOCs were collected at three sites and PAMS-Carbonyls were collected at two sites. The sampling equipment is listed in Table 12.1.

Figure 12.1 PAMS Network Map



Location of PAMS-VOC sites (yellow stickpins)
Location of PAMS-VOC and PAMS-Carbonyl sites (red stickpins)

The range of compounds for the PAMS program is in excess of 50 different possible ozone precursors and other compounds. The toxicity is gauged by risk factors instead of limits.

Table 12.1 PAMS Sampling Network

	Abbreviation	ALP	CMP	ECA		KMA**
	Name	Alpine	Camp Pendleton	El Cajon		San Diego-Overland
	Address	2300 W. Victoria Dr.	21441 W. B St.	1155 Redwood Ave.		5555 Overland Ave.
	Latitude Longitude	32° 50' 32" N 116° 46' 06" W	33° 13' 01" N 117° 23' 46" W	32° 47' 28" N 116° 56' 32" W		32° 50' 11" N 117° 07' 43" W
	AIRS ID	06 073 1006	06 073 1008	06 073 0003		06 073 0006
PAMS	Monitor Designation	PAMS	**PAMS**	PAMS	PAMS	PAMS
	Sampling Method	Canister	**Canister**	Canister	Cartridges	Cartridges
	Spatial Scale	US	**NS**	NS	NS	NS
	Monitoring Objective (Federal)	PAMS Type III	**PAMS Type I**	PAMS Type II	PAMS Type II	PAMS Type II
	Monitoring Objective (Local)	Trends	**Trends**	Trends	Trends	Trends
	Analysis By	SDAPCD	**SDAPCD**	SDAPCD	SDAPCD	SDAPCD
	Sampling Frequency	1:6*	**1:6***	1:6*	1:6*	1:6*
	Equipment Manufacturer/Model	Xonteck 910/912	**Xonteck 910/912**	Xonteck 910/912	Xonteck 925	Xonteck 925

GLOSSARY OF TERMS

Monitor Designation

PAMS	Photochemical Assessment Monitoring
SLAMS	State and Local Air Monitoring Stations
SPM	Special Purpose Monitoring
NCore	National Core
QA	Quality Assurance collocated
CSN	Chemical Speciation Network
STN	Speciation Trends Network
CSM	Community Scale Monitoring (SDAPCD)
CA TAC	California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

Canister	Evacuated stainless steel canister
Cartridges	Di-Nitrophenylhydrazine cartridges

Spatial Scale

MI	Micro Scale
MS	Middle Scale
NS	Neighborhood Scale
US	Urban Scale

Monitoring Objective (Federal)

PAMS Type I	Transported ozone, upwind of Type II site
PAMS Type II	Maximum ozone precoursor site, downwind of buisness district
PAMS Type III	Maximum ozone concentration site

Monitoring Objective (Local)

BURN	Support residential/agricultural/prescribed BURN decisions
TRENDS	Trends analysis
SIPM	State Implementation Plan (SIP) Maintenance requirement

Bold & Yellowed areas indicate a collocation of samplers to satisfy QA requirements.
All sample times are set to PST.

* During the non-PAMS season (November to the end of June), the samples have a 24-hour sampling duration. During the PAMS season (July to the end of October), the samplers collect four samples that each have a 3-hour sampling duration, as well as a 24-hr sample for carbonyls only. The 3-hour samples are collected on a set time schedule, as follows:

start time 0200 – 0500 end time
start time 0500 – 0800 end time
start time 1200 – 1500 end time
start time 1600 – 1900 end time

** In 2011, the EPA lowered the number of PAMS-VOC Type II sites required from two sites to one site. PAMS-VOC monitoring was halted on June 30, 2011 at the Overland site. The Camp Pendleton site became the PAMS-VOC collocated site on July 1, 2011.

Section 12.1.0 PAMS Sampling Frequency

Requirements for the sampling frequency of monitors for pollutants are in the July 1, 2010 edition of 40 CFR Part 58-"Ambient Air Quality Surveillance", Subpart G-Federal Monitoring, Appendix D –"Network Design Criteria for Ambient Air Quality Monitoring", Section 5 "Network Design for Photochemical Assessment Monitoring Stations (PAMS)", Table D–6 "Minimum Required PAMS Monitoring Locations and Frequencies". The sampling frequency for all PAMS samplers is every six days (see Table 12.1)

Section 12.2.0 PAMS Sampling Equipment

Table 12.2a PAMS Sampling Equipment

Pollutant	Abbreviation	Samplers	Collection Method	Collection Frequency	Analytical Method	Parameter Code	Method Code
Volatile Organic Compounds	VOC's	XonTech 910/912	Summa Canister	1:6	GC-FID	Table 12.2b	126
Carbonyl Compounds	n/a	XonTech 925	DNPH cartridges	1:6	HPLC	Table 12.2c	202

Table 12.2b PAMS VOC Parameter Codes

Compound	Parameter
Ethylene	43203
Acetylene	43206
Ethane	43202
Propylene	43205
Propane	43204
Isobutane	43214
Isobutylene	43270
1-Butene	43280
n-Butane	43212
trans-2-Butene	43216
cis-2-Butene	43217
Isopentane	43221
1-Pentene	43224
n-Pentane	43220
Isoprene	43243
Trans-2-pentene	43226
cis-2-Pentene	43227
2.2-Dimethylbutane	43244
Cyclopentane	43242
2.3-Cimethylbutane	43284
2-Methylpentane	43285
3-Methylpentane	43230
1-Hexene	43245
n-Hexane	43231
Methylcyclopentane	43262
2.4-Dimethylpentane	43247
Benzene	45201
cyclohexane	43248
2-Methylhexane	43263
2.3-Dimethylpentane	43291

Compound	Parameter
3-Methylhexane	43249
2.2.4-Trimethylpentane	43250
n-Heptane	43232
Methylcyclohexane	43261
2.3.4-Trimethylpentane	43252
Toluene	45202
2-Methylheptane	43960
3-Methylheptane	43253
n-Octane	43233
Ethylbenzene	45203
m-Xylene	45205
p-Xylene	45206
Styrene	45220
o-Xylene	45204
n-Nonane	43235
Isopropylbenzene	45210
n-Propylbenzene	45209
1-Ethyl 3-methylbenzene	45212
1-Ethyl 4-methylbenzene	45213
1.3.5-Trimethylbenzene	45207
1-Ethyl 2-methylbenzene	45211
1.2.4-Trimethylbenzene	45208
n-Decane	43238
1.2.3-Trimethylbenzene	45225
m-Diethylbenzene	45218
p-Diethylbenzene	45219
Undecane	43954
Total PAMS	43000
Total NMOC	43102

Table 12.2c PAMS Carbonyl Parameter Codes

Compound	Parameter
Formaldehyde	43502
Acetaldehyde	43503
Acetone	43551

Section 12.3.0 PAMS Design Criteria Requirements from the Code of Federal Regulation

Requirements for the numbers of PAMS sites and equipment are in the July 1, 2010 edition of 40 CFR Part 58-Ambient Air Quality Surveillance, Subpart G-Federal Monitoring, Appendix D, Section 5 Design Criteria for Photochemical Assessment Monitoring Stations (PAMS). The requirements for PAMS are in subsection 5.1 and are referenced in italics below

The PAMS program provides more comprehensive data on O_3 air pollution in areas classified as serious, severe, or extreme nonattainment for O_3 than would otherwise be achieved through the NCore and SLAMS sites. More specifically, the PAMS program includes measurements for O_3, oxides of nitrogen, VOC, and meteorology.

5.1 PAMS Monitoring Objectives.

PAMS design criteria are site specific. Concurrent measurements of O_3, oxides of nitrogen, speciated VOC, CO, and meteorology are obtained at PAMS sites. Design criteria for the PAMS network are based on locations relative to O_3 precursor source areas and predominant wind directions associated with high O_3 events. Specific monitoring objectives are associated with each location. The overall design should enable characterization of precursor emission sources within the area, transport of O_3 and its precursors, and the photochemical processes related to O_3 nonattainment. Specific objectives that must be addressed include assessing ambient trends in O_3, oxides of nitrogen, VOC species, and determining spatial and diurnal variability of O_3, oxides of nitrogen, and VOC species. Specific monitoring objectives associated with each of these sites may result in four distinct site types. Detailed guidance for the locating of these sites may be found in Photochemical Assessment Monitoring Stations Implementation Manual.

(a) Type 1 sites are established to characterize upwind background and transported O_3 and its precursor concentrations entering the area and will identify those areas which are subjected to transport.

(b) Type 2 sites are established to monitor the magnitude and type of precursor emissions in the area where maximum precursor emissions are expected to impact and are suited for the monitoring of urban air toxic pollutants.

(c) Type 3 sites are intended to monitor maximum O_3 concentrations occurring downwind from the area of maximum precursor emissions.

(d) Type 4 sites are established to characterize the downwind transported O_3 and its precursor concentrations exiting the area and will identify those areas which are potentially contributing to overwhelming transport in other areas.

5.2 Monitoring Period. PAMS precursor monitoring must be conducted annually throughout the months of June, July and August (as a minimum) when peak O_3 values are expected in each area. Alternate precursor monitoring periods may be submitted for approval to the Administrator as a part of the annual monitoring network plan required by § 58.10.

5.3 Minimum Monitoring Network Requirements. A Type 2 site is required for each area. Overall, only two sites are required for each area, providing all chemical measurements are made. For example, if a design includes two Type 2 sites, then a third site will be necessary to capture the NOy measurement. The minimum required number and type of monitoring sites and sampling requirements are listed in Table D–6 of this appendix. Any alternative plans may be put in place in lieu of these requirements, if approved by the Administrator.

Table D–6 of Appendix D to Part 58—Minimum Required PAMS Monitoring Locations and Frequencies

Measurement	***Where required***	***Sampling frequency (all daily except for upper air meteorology)***
Speciated VOC[2]	*Two sites per area, one of which must be a Type 2 site*	*During the PAMS monitoring period: (1) Hourly auto GC, or (2) Eight 3-hour canisters, or (3) 1 morning and 1 afternoon canister with a 3-hour or less averaging time plus Continuous Total Non-methane Hydrocarbon measurement.*
Carbonyl sampling	*Type 2 site in areas classified as serious or above for the 8-hour ozone standard*	*3-hour samples every day during the PAMS monitoring period.*
NO_X	*All Type 2 sites*	*Hourly during the ozone monitoring season.*
NO_y	*One site per area at the Type 3 or Type 1 site*	*Hourly during the ozone monitoring season.*
CO (ppb level)	*One site per area at a Type 2 site*	*Hourly during the ozone monitoring season.*
Ozone	*All sites*	*Hourly during the ozone monitoring season.*
Surface met	*All sites*	*Hourly during the ozone monitoring season.*
Upper air meteorology	*One representative location within PAMS area*	*Sampling frequency must be approved as part of the annual monitoring network plan required in 40 CFR 58.10.*

Section 12.4.0 PAMS Design Criteria for the SDAB Actual

Monitoring for the PAMS program is location and type/designation specific.

Table 12.3a PAMS VOCs Design Criteria for the SDAB Actual

Minimum Number of Type II Sites Required (#)	Number of Active Type II Sites (#)	Number of Type II Sites Needed (#)		Minimum Number of non-Type II Sites Required (#)	Number of Active non-Type II Sites (#)	Number of Sites Needed (#)
1	1	None		1	2	None

Table 12.3b PAMS Carbonyls Design Criteria for the SDAB Actual

Minimum Number of Type II sites Required (#)	Number of Active Type II Sites (#)	Number of Sites Needed (#)
1	2	None

Table 12.3c PAMS NOx Design Criteria for the SDAB Actual

Number of Active Type II Sites (#)	Minimum Number of NOx Monitors Required= Number of Type II Sites (#)	Number of Active Type II Sites with NOx Monitors (#)	Number of NOx Monitors Needed (#)	Type II Site Locations (name)	Type II Site AQS ID (#)
2	2	2	None	El Cajon San Diego-Overland	06-073-0003 06-073-0006

Table 12.3d PAMS NOy Design Criteria for the SDAB Actual

Minimum Number of NOy Monitors Required Either at a Type I or III Site (#)	Number of Active Type I or Type III Sites (#)	Number of NOy Monitors at an Active Type I or Type III Site (#)	Number of NOy Monitors Needed (#)	NOy Monitor Location (name)	NOy Monitor Location AQS ID (#)
1	2	1*	None	*El Cajon	06-073-0003

*The SDAPCD measures for NOy at the NCore location, a PAMS Type II site. The District has been granted a waiver by the EPA Region IX Authority to designate this site/location as to satisfying the PAMS NOy requirement at a PAMS Type II site.

Table 12.3e PAMS CO Design Criteria for the SDAB Actual

Minimum Number of CO Monitors Required at a Type II Site (#)	Number of Active Type II Sites (#)	Number of CO Monitors at an Active Type II Site (#)	Number of CO Monitors Needed (#)	CO Monitor Location (name)	CO Monitor Location AQS ID (#)
1	2	1	None	El Cajon	06-073-0003

Table 12.3f PAMS O_3 Design Criteria for the SDAB Actual

Number of Active PAMS Sites (#)	Minimum Number of O_3 Monitors Required= Number of PAMS Sites (#)	Number of Active PAMS Sites with O_3 Monitors (#)	Number of O_3 Monitors Needed (#)	PAMS Sites Locations (name)	PAMS Sites AQS ID (#)
4	4	4	None	El Cajon San Diego-Overland Alpine Camp Pendleton	06-073-0003 06-073-0006 06-073-1006 06-073-1008

Table 12.3g PAMS Surface Meteorology Design Criteria for the SDAB Actual

Number of Active PAMS Sites (#)	Minimum Number of Surface Meteorology Sites Required= Number of PAMS Sites (#)	Number of Active PAMS Sites with Surface Meteorology (#)	Number of Surface Meteorology Sites Needed (#)	Surface Meteorology Sites Locations (name)	Surface Meteorology Sites AQS ID (#)
4	4	4	None	El Cajon San Diego-Overland Alpine Camp Pendleton	06-073-0003 06-073-0006 06-073-1006 06-073-1008

Table 12.3h PAMS Upper Air Meteorology Design Criteria for the SDAB Actual

Minimum Number of Upper Air Meteorology Required in a PAMS area (#)	Number of Active Upper Air Meteorology Sites (#)	Number of Upper Air Meteorology Sites Needed (#)	Upper Air Meteorology Site Location (name)	Upper Air Meteorology Site Location AQS ID (#)
1	1	None	Kearny Villa Road	06-073-0003

The current radar wind profiler is over 14 years old and in need of refurbishing. It must be overhauled or replaced soon, so this criteria can continued to be met.

12.5.0 PAMS – Quality Control (QC) Practices for the Network

There are no references to 40 CFR for Quality Control for the PAMS program.

Requirements for Quality Control for the PAMS-Carbonyl program are in the Technical Assistance Document (TAD), TO-11A "Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology]" and the SDAPCD Standard Operating Procedure (SOP). The Quality Control measures taken to ensure the quality of the data are too voluminous to print here. Please refer to the San Diego Air Pollution Control District's Standard Operating Procedure for the necessary documentation.

Requirements for Quality Control for the PAMS-VOC program are in the Technical Assistance Document (TAD), TO-14A "Determination Of Volatile Organic Compounds (VOCs) In Ambient Air Using Specially Prepared Canisters With Subsequent Analysis By Gas Chromatography", and the SDAPCD Standard Operating Procedure (SOP). The Quality Control measures taken to ensure the quality of the data are too voluminous to print here. Please refer to the San Diego Air Pollution Control District's Standard Operating Procedure for the necessary documentation.

12.6.0 PAMS – Quality Assurance (QA) Practices for the Network

There are no references to 40 CFR for Quality Assurance for the PAMS program.

Requirements for the Quality Assurance for the PAMS-Carbonyl program are in the Technical Assistance Document (TAD), TO-11A "Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology]" and the SDAPCD Standard Operating Procedure (SOP). The Quality Assurance measures taken to ensure the quality of the data are too voluminous to print here. Please refer to the San Diego Air Pollution Control District's Standard Operating Procedure for the necessary documentation.

Requirements for Quality Assurance for the PAMS-VOC program are in the Technical Assistance Document (TAD), TO-14A "Determination Of Volatile Organic Compounds (VOCs) In Ambient Air Using Specially Prepared Canisters With Subsequent Analysis By Gas Chromatography", and the SDAPCD Standard Operating Procedure (SOP). The Quality Assurance measures taken to ensure the quality of the data are too voluminous to print here. Please refer to the San Diego Air Pollution Control District's Standard Operating Procedure for the necessary documentation

The PAMS-Carbonyl and the PAMS-VOC teams participate in the EPA Region IX's annual Performance Evaluation program. When offered, the PAMS-Carbonyl and PAMS-VOC team participate in the statewide and nationwide comparison study offered by the ARB and EPA-Headquarters, respectively.

2.7.0 PAMS Changes to the Network

Any official decommissioning of any monitor or monitoring location will be proposed in a letter with accompanying documentation to the EPA and, when appropriate, the ARB. If a station is to relocate, parallel sampling between the current location and the new location will be undertaken, when possible.

12.7.1 PAMS Changes to the Design Criteria from the Code of Federal Regulations

The PAMS design criteria applicable to calendar year (CY) 2013 have not changed, so the information in Section 12.5.0 will apply to CY 2013.

12.7.2 PAMS – Changes to the Equipment

San Diego-Overland

In the 1st Quarter of 2012, the PAMS-Carbonyl experienced irreparable catastrophic failure. The District was instructed by EPA Region IX authorities to not replace the sampler until the PAMS program is re-evaluated by EPA headquarters.

12.7.3 PAMS – Changes to the Equipment

San Diego-Overland

This station is a PAMS Type II site. In 2010, the EPA issues new PAMS guidance reducing the number of required PAMS Type II sites to two for VOC analysis. Sampling was halted on June 30, 2011 at the Overland location. The Camp Pendleton PAMS Type I site became the location of the QA/Collocated sampler on July 1, 2011.

Due to tenancy issues, the District relocated the San Diego-Overland (KMA) site in Kearny Mesa to a new location off Kearny Villa Road (KVR) in the 1st Qtr of 2012. Since late 2010, O_3 has been collected in parallel at KVR with the KMA location. In late 2011, NOx has been collected in parallel at the KVR location with the KMA location (the District does not have the resources to run parallel sampling for the other pollutants at the KVR site). The new station houses O_3, NOx, PM_{10} (plus a collocated sampler), $PM_{2.5}$-Sequential (non-speciated, plus a collocated sampler), PAMS-Carbonyl equipment, and meteorological equipment.

Camp Pendleton

The Camp Pendleton PAMS Type I site became the location of the QA/Collocated sampler on July 1, 2011.

El Cajon

Solar radiation monitoring and barometric pressure monitoring will be added to this location once the station is moved to its new permanent location (possibly the 4th quarter of 2013).

12.7.2 PAMS - Changes in sampling locations

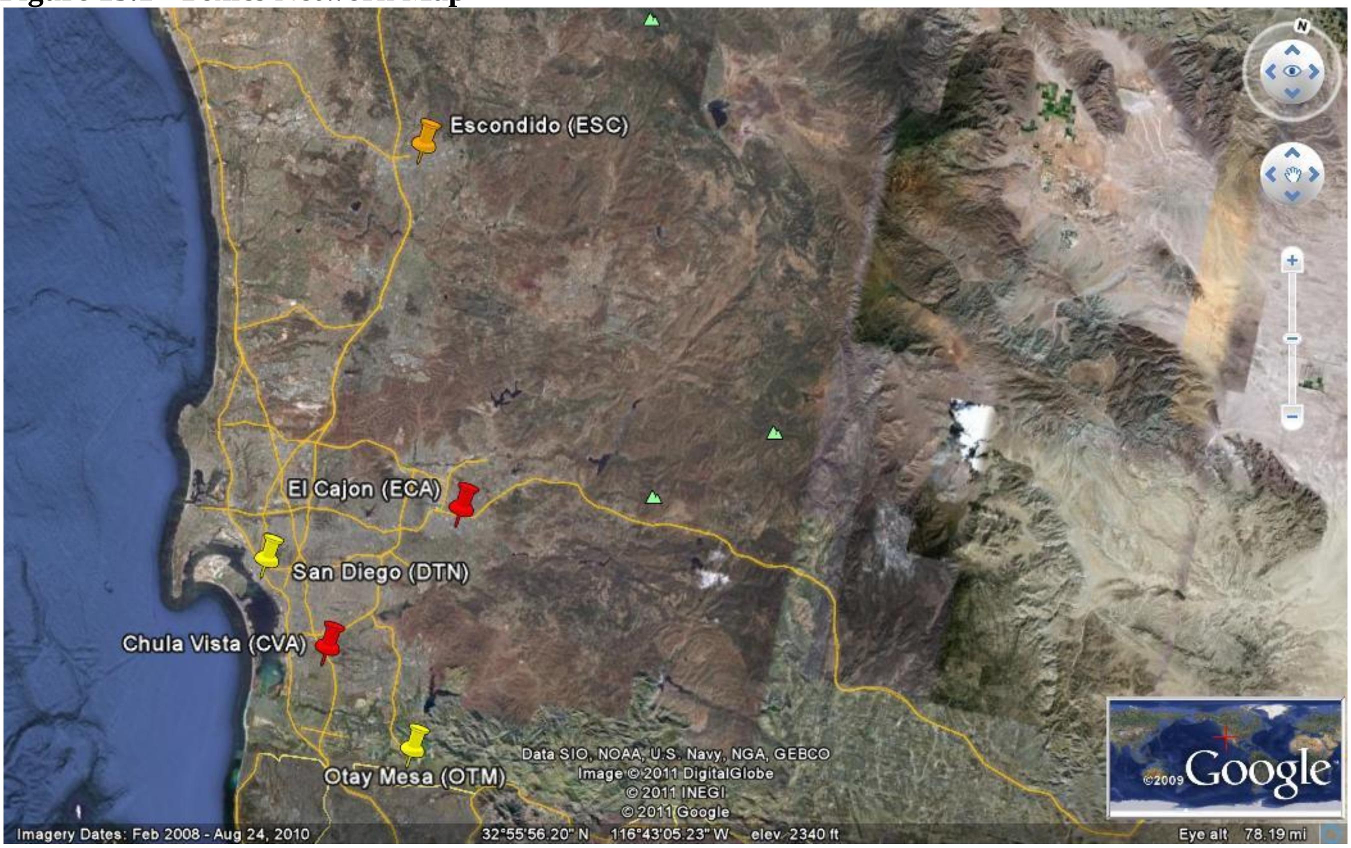
Escondido

In late 2012 – early 2013, this location will be investigated as a possible site for PAMS-Carbonyl sampling and be designated as a PAMS Type II site.

Section 13.0.0 Toxics Program Introduction

For 2011, Toxics-related sampling was conducted at five sites; three SDAPCD sites and two ARB sites (Figure 13.1). As yet, there are no NAAQS standards which to compare the data. The sampling equipment are listed in Table 13.1.

Figure 13.1 Toxics Network Map



Location of CARB only sites for Toxic-VOCs, metals, chromium (VI), and aldehydes (red stickpins).
Location of SDAPCD sites for Toxic-VOCs and metals (yellow stickpins)
Location of SDAPCD sites for Toxic-VOCs only (orange stickpin)

The range of compounds for the Toxics programs is in excess of 100 different possible carcinogenic, irritants, and mutagenic chemicals. Their toxicities are gauged by risk factors rather than limits.

Table 13.1 Toxics Sampling Network

	Abbreviation	CVA				ECA				ESC	OTM		DTN	
	Name	Chula Vista				El Cajon				Escondido	Otay Mesa-Border Xing		San Diego-Beardsley	
	Address	80 E. J St.				1155 Redwood Ave.				600 E. Valley	1100B Paseo International		1110A Beardsley St.	
	Latitude	32° 37' 52" N				32° 47' 28" N				33° 07' 40" N	32° 33' 08" N		32° 42' 05" N	
	Longitude	117° 03' 33" W				116° 56' 32" W				117° 04' 31" W	116° 56' 16" W		117° 08' 59" W	
	AIRS ID	06 073 0001				06 073 0003				06 073 1002	06 073 2007		06 073 1010	
TOXICS	Pollutant	Toxics-VOCs	Toxics-Metals	Toxics-Cr (VI)	Toxics-Aldehydes	Toxics-VOCs	Toxics-Metals	Toxics-Cr (VI)	Toxics-Aldehydes	Toxics-VOCs	Toxics-VOCs	Toxics-Metals	Toxics-VOCs	Toxics-Metals
	Monitor Designation	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	CA TAC	SDAPCD-CSM VOCs	SDAPCD-CSM VOCs	SDAPCD-CSM Metals	SDAPCD-CSM VOCs	SDAPCD-CSM Metals
	Sampling Method	Canister	Filter	Filter	Cartridges	Canister	Filter	Filter	Cartridges	Canister-FSL	Canister-FSL	Filter	Canister-FSL	Filter
	Spatial Scale	NS	NS	NS	NS	NS	NS	NS	NS	NS	MI	MI	NS	NS
	Monitoring Objective (federal)	RC	RC	RC	RC	RC	RC	RC	RC	RC	IM	IM	RC	RC
	Monitoring Objective (local)	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends	Trends
	Analysis By	ARB	ARB	ARB	ARB	ARB	ARB	ARB	ARB	SDAPCD	SDAPCD	SDAPCD	SDAPCD	SDAPCD
	Sampling Frequency	1:12	1:12	1:12	1:12	1:12	1:12	1:12	1:12	1:6	1:6	1:12	1:6	1:12
	Equipment Manufacturer/Model	Xontech 910/912	Xontech 924	Xontech 924	Xontech 924	Xontech 910/912	Xontech 924	Xontech 924	Xontech 924	XonTech 910A Fused Silica Lined	XonTech 910A Fused Silica Lined	Xontech 924	XonTech 910A Fused Silica Lined	Xontech 924

GLOSSARY OF TERMS

Monitor Designation

- PAMS Photochemical Assessment Monitoring
- SLAMS State and Local Air Monitroing Stations
- SPM Special Purpose Monitoring
- NCore National Core
- QA Quality Assurance collocated
- CSN Chemical Speciation Network
- STN Speciation Trends Network
- CSM Community Scale Monitoring (SDAPCD)
- CA TAC California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

- Canister Evacuated stainless steel canister
- Canister-FSL Evacuated stainless steel canister-Fused silica lined
- Cartridges Di-Nitrophenylhydrazine cartridges
- Filter Quartz filters

Spatial Scale

- MI Micro Scale
- MS Middle 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

Section 13.1.0 Toxics Sampling Frequency

Requirements for the sampling frequency of monitors for pollutants in the Toxics program are set by the EPA. The EPA established the minimum collection frequency for VOCs, aldehydes, and other Hazardous Air Pollutants (HAPs) with respect to 24-hour integrated samples. The frequencies are listed in Table 13-1.

Section 13.2.0 TOXICS Sampling Equipment

Table 13.2a TOXICS Equipment, 2011

Pollutant	Abbrev.	Collection Equipment	Collection Method	Collection Frequency	Analytical Method	Parameter Code	Method Code
Volatile Oraganic Compounds	VOC's	Xonteck 910A-FSL (SDAPCD) Xonteck 910/912 (ARB)	Summa Canister-FSL(SDAPCD) Summa Canister (ARB)	1:6 (SDAPCD) 1:12 (ARB)	GC-MS	Table 13.b (SDAPCD) (See ARB)	210
Aldehydes	none	XonTech 924	DNPH cartridge	1:12 (ARB)	HPLC	(See ARB)	(See ARB)
Cr (VI)	none	XonTech 924	Teflon Filter	1:12 (ARB)	IC	(See ARB)	(See ARB)
Metals	none	XonTech 924	Teflon Filter	1:12 (SDAPCD) 1:12 (ARB)	ICP-MS (SDAPCD) (See ARB)	Not analyzed (SDAPCD) (See ARB)	Not analyzed (SDAPCD) (See ARB)

Table 13.2b Toxics VOCs Parameters Codes

Compound	Parmeter	Compound	Parmeter
Dichlorodifluoromethane	43823	Bromoform	43806
Chloromethane	43801	Styrene	45220
Dichlorotetrafluoroethane	43208	1,1,2,2-Tetrachloroethane	43818
Vinyl Chloride	43860	o-Xylene	45204
1,3-Butadiene	43218	4-Ethyltoluene	45213
Bromomethane	43819	1,3,5-Trimethylbenzene	45207
Chloroethane	43812	1,2,4-Trimethylbenzene	45208
Trichlorofluoromethane	43811	1,3-Dichlorobenzene	45806
Acrolein	43505	1,4-Dichlorobenzene	45807
Acetone	43551	1,2-Dichlorobenzene	45805
2-Methyl-1,3-butadiene	43243	1,2,4-Trichlorobenzene	45810
1,1-Dichloroethene	43826	Hexachlorobutadiene	43844
Acrylonitrile	43704	Acetonitrile	43702
Methylene Chloride	43802	Vinyl acetate	43447
Trichlorotrifluoroethane	43207	n-Hexane	43231
trans-1,2-Dichloroethene	43838	Ethyl acetate	43209
2-Methoxy-2-methylpropane	43372	Methyl methacrylate	43441
1,1-Dichloroethane	43813	4-Methyl-2-pentanone (MIBK)	43560
2-Butanone	43552	Benzyl chloride	45809
cis-1,2-Dichloroethene	43839	Naphthalene	45850
Chloroform	43803		
1,2-Dichloroethane	43815		
1,1,1-Trichloroethane	43814		
Carbon Tetrachloride	43804		
Benzene	45201		
1,2-Dichloropropane	43829		
Trichloroethene	43824		
cis-1,3-Dichloropropene	43831		
trans-1,3-Dichloropropene	43830		
1,1,2-Trichloroethane	43820		
Toluene	45202		
1,2-Dibromoethane	43843		
Tetrachloroethene	43817		
Chlorobenzene	45801		
Ethylbenzene	45203		
m,p-Xylene	45109		

Section 13.3.0 TOXICS Design Criteria Requirements

There are no design criteria for the Toxics program. The monitor placement is decided by the governing air basin authority according to expected Hazardous Air Pollutant (HAPs) levels.

13.4.0 TOXICS – Quality Control (QC) Practices for the Network

There are no references to 40 CFR for Quality Control for the TOXICS program.

The guidance documentation for the Quality Control for the TOXICS-Aldehydes program are in the NATTS Technical Assistance Document (TAD), TO-11A "Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology]" and the SDAPCD Standard Operating Procedure (SOP). The Quality Control measures taken to ensure the quality of the data are too voluminous to print here. Please refer to the San Diego Air Pollution Control District's Standard Operating Procedure for the necessary documentation.

The guidance documentation for the Quality Control for the TOXICS-VOC program are in the NATTS Technical Assistance Document (TAD), TO-15 "Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS)", and the SDAPCD Standard Operating Procedure (SOP). The Quality Control measures taken to ensure the quality of the data are too voluminous to print here. Please refer to the San Diego Air Pollution Control District's Standard Operating Procedure for the necessary documentation.

The guidance documentation for the Quality Control for the TOXICS-Metals program are in the NATTS Technical Assistance Document (TAD), IO-3.5 "Determination of Metals in Ambient Particulate Matter Using Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)" and the SDAPCD Standard Operating Procedure (SOP). The Quality Control measures taken to ensure the quality of the data are too voluminous to print here. Please refer to the San Diego Air Pollution Control District's Standard Operating Procedure for the necessary documentation.

13.5.0 TOXICS Quality Assurance (QA) Practices for the Network

There are no references to 40 CFR for Quality Assurance for the TOXICS program.

The guidance documentation for the Quality Assurance for the TOXICS-Aldehyde program are in the NATTS Technical Assistance Document (TAD), TO-11A "Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology]" and the SDAPCD Standard Operating Procedure (SOP). The Quality Assurance measures taken to ensure the quality of the data are too voluminous to print here. Please refer to the San Diego Air Pollution Control District's Standard Operating Procedure for the necessary documentation.

The guidance documentation for the Quality Assurance for the TOXICS-VOC program are in the NATTS Technical Assistance Document (TAD), TO-15 "Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS)", and the SDAPCD Standard Operating Procedure (SOP). The Quality Assurance measures taken to ensure the quality of the data are too voluminous to print here. Please refer to the San Diego Air Pollution Control District's Standard Operating Procedure for the necessary documentation.

The guidance documentation requirements for the Quality Assurance for the TOXICS-Metals program are in the NATTS Technical Assistance Document (TAD), IO-3.5 "Determination of Metals in Ambient Particulate Matter Using Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)" and the SDAPCD

Standard Operating Procedure (SOP). The Quality Assurance measures taken to ensure the quality of the data are too voluminous to print here. Please refer to the San Diego Air Pollution Control District's Standard Operating Procedure for the necessary documentation.

13.6.0 TOXICS – Changes to the Network

Any official decommissioning of any monitor or monitoring location will be proposed in a letter with accompanying documentation to the EPA and, when appropriate, the ARB. If a station is to relocate, parallel sampling between the current location and the new location will be undertaken, when possible.

13.6.1 TOXICS – Changes to the Design Criteria Requirements

There are no design criteria changes for the Toxics program.

13.6.1.1 TOXICS – Changes to the Equipment

None.

13.6.2 TOXICS - Changes in sampling locations

Otay Mesa station

The North American Free Trade Agreement (NAFTA) greatly increased the heavy truck traffic at the Otay Mesa border crossing. It is now the second busiest commercial border crossing in the United States. This, coupled with the projected increase from a pending second Point of Entry at the Otay Mesa border crossing, has forced the redesignation of the Otay Mesa station instruments from Neighborhood Scale to MicroScale and Impact levels. Also, the District will be forced out of this location in FY 2012-2013. This station has O_3, NOx, SO_2, PM_{10}, meteorological equipment, and XonTecks 924 & 910 samplers for Toxics sampling.

To measure concentrations representative of the air mass in the south San Diego region, the District proposes to decommission the Otay Mesa border location and relocate the station about 3.3 kilometers northwest by the Otay Lakes area (Google Earth coordinates of 32^{o}37'49.72'N, 116^{o}56'20.60"W). The proposed new station will house O_3, NOx, PM_{10} (plus a collocated sampler), $PM_{2.5}$ (manual), $PM_{2.5}$ (continuous), meteorological equipment, and XonTechs 924 & 910A samplers for Toxics sampling.

San Diego-Beardlsey

A carbonyl sampling channel will be added to the Xontech 924 in late-2012.

Donovan

A carbonyl sampling channel will be added to the Xontech 924, once the station becomes permanent.

Escondido

In late-2012, this location will be investigated as a possible site for PAMS-Carbonyl sampling and be redesignated as a PAMS Type II site. If we are unable to obtain funding for a suite of carbonyl samplers under the PAMS program, we will investigate carbonyl sampling through alternative means, possibly the SuperSASS.

Section 14.0.0 Quality Assurance Introduction

Each pollutant program must satisfy the requirements of 40 CFR Part 58, Appendices A, C, and E. All audits are performed with equipment and gases that are used only for audits by staff that do not perform the calibrations. All equipment is calibrated against NIST traceable standards. This table lists the certification schedule.

Table 14.1 Quality Assurance Equipment Certification Matrix

The Monitor/Sampler for	Is Audited	With a(n)	It is Certified	With a(n)	It is Certified/Calibrated	By
O_3 Ambient	Annually	API 400	Quarterly	API 401	Annually	The ARB
	Annually	API 700EU	Semi-annually	BIOS ML-800 Series	Annually	The Manufacturer
NO_2 Ambient	Annually	Protocol I Gas	Every Two Years	By the Manufacturer	-----	-----
	Annually	API 700EU	Semi-annually	BIOS ML-800 Series	Annually	The Manufacturer
SO_2 Ambient	Annually	Protocol I Gas	Every Two Years	By the Manufacturer	-----	-----
	Annually	API 700EU	Semi-annually	BIOS ML-800 Series	Annually	The Manufacturer
CO Ambient	Annually	Protocol I Gas	Every Three Years	By the Manufacturer	-----	-----
	Annually	API 700EU	Semi-annually	BIOS ML-800 Series	Annually	The Manufacturer
NOy NCore	Quarterly	Protocol I Gas	Every Two Years	By the Manufacturer	-----	-----
	Quarterly	API 700EU	Semi-annually	BIOS ML-800 Series	Annually	The Manufacturer
SO_2 NCore	Quarterly	Protocol I Gas	Every Two Years	By the Manufacturer	-----	-----
	Quarterly	API 700EU	Semi-annually	BIOS ML-800 Series	Annually	The Manufacturer
CO NCore	Quarterly	Protocol I Gas	Every Three Years	By the Manufacturer	-----	-----
	Quarterly	API 700EU	Semi-annually	BIOS ML-800 Series	Annually	The Manufacturer
PM_{10} (hi-vol)	Semi-annually	Variable Orifice	Anually	ARB Laboratory Standard	-----	The ARB
	Semi-annually	Voltmeter	Anually	By the Manufacturer	-----	-----
	Semi-annually	Electronic Manometer	Anually	By the Manufacturer	-----	-----
	Semi-annually	Thermocouple	Replaced Every Two Years	-----	-----	-----
PM_{10} (lo-vol)	Quarterly	BGI TetraCal	Anually	By the Manufacturer	-----	-----
	Quarterly	Thermocouple	Replaced Every Two Years	-----	Annually	-----
Pb-TSP (hi-vol)	*Semi-annually	Variable Orifice	Anually	ARB Laboratory Standard	-----	The ARB
	*Semi-annually	Voltmeter	Anually	By the Manufacturer	Annually	-----
	*Semi-annually	Electronic Manometer	Anually	By the Manufacturer	Annually	-----
	*Semi-annually	Thermocouple	Replaced Every Two Years	-----	-----	-----
$PM_{2.5}$ (lo-vol)	Quarterly	BGI TetraCal	Anually	By the Manufacturer	-----	-----
	Quarterly	Thermocouple	Replaced Every Two Years	-----	-----	-----
PAMS-Carbonyls	Annually	BIOS-220 Series	Anually	By the Manufacturer	-----	-----
TOXICS-Metals	Annually	BIOS-220 Series	Anually	By the Manufacturer	-----	-----

* The airport TSP samplers are calibrated and audited quarterly, due to the short term duration of the project

Section 14.1.0 Quality Assurance – Programs

There are several audit programs external to the District in which we participate.

Section 14.1.1 Quality Assurance – State

The ARB QA section annually audits about 75% of the criteria pollutant monitors in the SDAB. As part of the annual audit, the ARB QA team conducts siting evaluations. These include physical measurements and observations of each station. They are: probe height above ground level, meteorological sensors above ground level, distance from trees, type of ground cover, residence time, obstructions to air flow, distance to local sources, topography, predominant wind direction, probe inlet material, etc. All ARB audits are performed by ARB personnel or their designee. They are scheduled by ARB personnel, but coordinated with District personnel.

Section 14.1.2 Quality Assurance – Federal/PEP Audits

The $PM_{2.5}$ program participates in the EPA PEP program in which about five sites are audited per year. All PEP audits are performed by EPA personnel or their designee. They are scheduled by EPA personnel and unannounced to the District until the day of or the day before the test.

The Toxics-VOCs program participates in State, Regional, and Federal Performance Evaluation (PE) programs, when offered.

The PAMS-VOCs and PAMS-Carbonyls programs participates in State, Regional, and Federal Performance Evaluation (PE) programs, when offered.

The Lead program participates in State, Regional, and Federal Performance Evaluation (PE) programs, when offered.

Section 14.1.3 Quality Assurance – Federal/TSA Audits

Every three (3) years the EPA conducts a Technical Systems Audit (TSA) of the District's air quality monitoring network and procedures. The audit examines all aspects of the District's analytical laboratory and field monitoring processing operations.

Section 14.2.0 Quality Assurance – Collocation

40 CFR Part 58 requires 15% of $PM_{2.5}$-FEM, $PM_{2.5}$-FRM, and PM_{10} monitors be collocated. Additionally, at least one FRM sampler must be collocated with an FRM sampler. It also requires all STN and CSN samplers be collocated. Please note, the Pb-TSP samplers are part of the Airport, and NCore programs, which have different collocation requirements (see the Lead section for details). All the District's sites meet these requirements. Please see each of the aforementioned pollutants' section for a more detailed description of the collocation practices that are used. A summary of all the collocation requirements are in Table 14.2.

Table 14.2 Summary of Collocated Monitors for the SDAB

	Pollutant or Program	Minimum Number of Collocated Sites Required	Number of Active Collocated Sites	Number of Collocated Sites Needed
Collocation	$PM_{2.5}$ FRM Collocated	1	1	None
	$PM_{2.5}$ FEM Collocated	1	1	None
	$PM_{2.5}$ FEM & FRM Collocated	1	3	None
	$PM_{2.5}$ CSN & STN Collocated	2	2	None
	Pb Airports	1	1	None

Section 14.3.0 Quality Assurance –Summary of Duties

See Table 14.3 and 14.4 for a summary of the audits performed in the SDAB.

Particulate

- 100% of all the $PM_{2.5}$ samplers are audited quarterly by the District's audit team.
- ~75% of all the FRM and FEM $PM_{2.5}$ samplers are audited by the ARB annually (see Table 14.3 for a summary or each station's site description in the appendix)
- ~75% of the FRM & FEM $PM_{2.5}$ samplers are audited by the EPA annually (see Table 14.3 for a summary or each station's site description in the appendix).

Gaseous

- 100% of all gaseous monitors are audited annually by the District's audit team.
- 25% of each gaseous pollutant monitors, except the NCore ones, are audited quarterly by the District's audit team.
- 100% of all NCore pollutant monitors are audited by the EPA or their designee.
- ~75% of all the gaseous monitors are audited by the ARB annually (see Table 14.3 for a summary or each station's site description in the appendix).

Table 14.3 Summary of Particulate Audits Performed in the SDAB

Parameter	Abbreviation	ALP	CMP	CVA	ECA[1]			ESC			OTM	DVN	DTN		KMA	CRQ	SEE
	Name	Alpine	Camp Pendleton	Chula Vista	El Cajon			Escondido			Otay Mesa-Border Xing	Otay Mesa-Donovan	San Diego-Beardsley		San Diego-Overland	McClellan-Palomar Airport	Gillespie Field
	AQS ID	06 073 1006	06 073 1008	06 073 0001	06 073 0003			06 073 1002			06 073 2007	06 073 1014	06 073 1010		06 073 0006	06 073 1020	06 073 1021
PM_{10}	Monitor Designation			SLAMS	SLAMS	SLAMS, NCore		SLAMS			SLAMS	SLAMS	SLAMS		SLAMS		
PM_{10}	Sampling Method			SI	SI	SQ		SI			SI	SI	SI		SI		
PM_{10}	Spatial Scale			NS	NS	NS		NS			MI	NS	NS		NS		
PM_{10}	Monitoring Objective (Federal)			RC	HC	HC		RC			IM	RC	RC		RC		
PM_{10}	Local Audit (SDAPCD)			1/14, 8/10	3/11, 6/24	3/11, 6/9, 8/23, 12/9		4/6, 12/8			5/5, 10/26	5/5, 12/30	3/11, 8/10		1/9, 8/2		
PM_{10}	State Audit (ARB)			5/17	5/19	not done		5/26			5/16	5/16	5/27		not done		
PM_{10}	Federal Audit (PEP)			n/a	n/a	n/a		n/a			n/a	n/a	n/a		n/a		
PM_{10}	Equipment Manufacturer/Model			GMW 2000H w/ SA 1200 head	GMW 2000H w/ SA 1200 head	Thermo 2025		GMW 2000H w/ SA 1200 head			GMW 2000H w/ SA 1200 head	GMW 2000H w/ SA 1200 head	GMW 2000H w/ SA 1200 head		GMW 2000H w/ SA 1200 head		
Pb-TSP	Monitor Designation				NCore											SLAMS	SLAMS
Pb-TSP	Sampling Method				IPMS											IPMS	IPMS
Pb-TSP	Spatial Scale				NS											MI	MI
Pb-TSP	Monitoring Objective (Federal)				RC											IM	IM
Pb-TSP	Local Audit (SDAPCD)				See footnote 2											See footnote 2	See footnote 2
Pb-TSP	State Audit (ARB)				See footnote 2											See footnote 2	See footnote 2
Pb-TSP	Federal Audit (PEP)				See footnote 2											See footnote 2	See footnote 2
Pb-TSP	Equipment Manufacturer/Model				Tisch TE-5170BLVFC+											Tisch TE-5170BLVFC+	Tisch TE-5170BLVFC+
$PM_{2.5}$ (non-speciated)	Monitor Designation	SPM	SLAMS	SLAMS	SLAMS, NCore	SLAMS, NCore		SLAM	SLAMS				SLAMS	SLAMS	SLAMS		
$PM_{2.5}$ (non-speciated)	Sampling Method	CT	CT	SQ	CT	SQ		CT	SQ				CT	SQ	SQ		
$PM_{2.5}$ (non-speciated)	Spatial Scale	US	NS	NS	NS	NS		NS	NS				NS	NS	NS		
$PM_{2.5}$ (non-speciated)	Monitoring Objective (Federal)	RC	BL	RC	RC	RC		RC	RC				RC	RC	RC		
$PM_{2.5}$ (non-speciated)	Local Audit (SDAPCD)	3/11, 6/21, 8/31, 12/7	3/15, 6/30, 9/13, 12/15	3/15, 6/28 9/13, 12/9	3/11, 6/9, 8/23, 12/9	3/11, 6/9, 8/23, 12/9		3/3, 5/19, 9/22, 12/15	3/3, 5/19, 9/22, 12/15				3/18, 5/20 8/29, 12/16	3/9, 5/20, 8/29, 12/6	2/10, 5/13, 8/29, 12/6		
$PM_{2.5}$ (non-speciated)	State Audit (ARB)	5/18	not done	5/17	5/19	5/19		5/26	5/26				5/27	5/27	not done		
$PM_{2.5}$ (non-speciated)	Federal Audit (PEP)	n/a	2/17-down for repair, 5/25	none for 2011	8/31, 11/8			8/31, 11/8					none for 2011		5/21, 8/31, 11/8		
$PM_{2.5}$ (non-speciated)	Equipment Manufacturer/Model	Met One BAM	Met One FEM BAM	Thermo 2025	Met One FEM BAM	Thermo 2025		Met One FEM BAM	Thermo 2025				Met One FEM BAM	Thermo 2025	Thermo 2025		
$PM_{2.5}$ (speciated)	Monitor Designation				CSN, NCore	STN, NCore	CSM Carbon Speciated	CSN	STN	CSM Carbon Speciated			CSM				
$PM_{2.5}$ (speciated)	Sampling Method				SP	SP	SP	SP	SP	SP			SP				
$PM_{2.5}$ (speciated)	Spatial Scale				NS	NS	NS	NS	NS	NS			NS				
$PM_{2.5}$ (speciated)	Monitoring Objective (Federal)				RC	RC	RC	RC	RC	RC			RC				
$PM_{2.5}$ (speciated)	Local Audit (SDAPCD)				3/11, 6/9, 8/23, 12/9	3/11, 6/9, 8/23, 12/9	3/11, 6/9, 8/23, 12/9	3/3, 5/19, 9/22, 12/15	3/3, 5/19, 9/22, 12/15	3/3, 5/19, 9/22, 12/15			3/18, 5/20, 8/29, 12/16				
$PM_{2.5}$ (speciated)	State Audit (ARB)				n/a	n/a	n/a	n/a	n/a	n/a			n/a				
$PM_{2.5}$ (speciated)	Federal Audit (PEP)				n/a	n/a	n/a	n/a	n/a	n/a			n/a				
$PM_{2.5}$ (speciated)	Equipment Manufacturer/Model				URG-3000N	Met One SASS	Met One SASS	URG-3000N	Met One SuperSASS	Met One SASS			Met One SASS				

GLOSSARY OF TERMS

Monitor Designation
- PAMS Photochemical Assessment Monitoring
- SLAMS State and Local Air Monitoring Stations
- SPM Special Purpose Monitoring
- NCore National Core
- QA Quality Assurance collocated
- CSN Supplemental Speciation-Chemical Speciation Network
- STN Supplemental Speciation-Speciation Trends Network
- CSM Community Scale Monitoring (SDAPCD)
- CA TAC California Toxics Air Contaminant Monitoring

Sampling or Analysis Method
- CL Chemiluminescence
- CT Low volume, continuous sampler, size selective inlet
- 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
- IPMS Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale
- MI Micro Scale
- MS Middle 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
- TREND Trends analysis
- SIPM State Implementation Plan (SIP) Maintenance requirement

[1] The El Cajon station have a set of paired PM_{10} & $PM_{2.5}$ (lo-vol) samplers to calculate PMcoarse

[2] The Pb-TSP samplers were installed late 4th Quarter of 2011, but sampling did not commence until the 1st Quarter of 2012.

Table 14.4 Summary of Gaseous Audits Performed in the SDAB

	Abbreviation	ALP	CMP	CVA	DMR	ECA[1]		ESC	OTM	DTN	KMA	KVR
	Name	Alpine	Camp Pendleton	Chula Vista	Del Mar	El Cajon		Escondido	Otay Mesa-Border Xing	San Diego-Beardsley	San Diego-Overland	Kearny Villa Rd.
	AQS ID	06 073 1006	06 073 1008	06 073 0001	06 073 1001	06 073 0003		06 073 1002	06 073 2007	06 073 1010	06 073 0006	06 073 1016
O_3	Monitor Designation	PAMS, SLAMS	PAMS, SLAMS	SLAMS	SLAMS	PAMS, SLAMS, NCore		SLAMS	SLAMS	SLAMS	PAMS, SLAMS	SPM
O_3	Sampling Method	UV	UV	UV	UV	UV		UV	UV	UV	UV	UV
O_3	Spatial Scale	US	NS	NS	NS	NS		NS	MI	NS	NS	NS
O_3	Monitoring Objective (federal)	HC	BL	RC	BL	RC		RC	IM	RC	RC	RC
O_3	Local Audits (SDAPCD)	10/19	8/19	5/25	6/14	8/12, 12/28		12/8	10/21	2/16	5/26	not operational long enough
O_3	State Audits (ARB)	5/18	not done	5/17	not done	5/19		5/26	5/16	5/27	not done	not operational long enough
O_3	Equipment Manufacturer/Model	Thermo 49	Thermo 49	Thermo 49	Thermo 49	Thermo 49		Thermo 49	Thermo 49	Thermo 49	Thermo 49	Thermo 49
CO	Monitor Designation					NCore		SLAMS		SLAMS		
CO	Sampling Method					IR		IR		IR		
CO	Spatial Scale					NS		NS		NS		
CO	Monitoring Objective (federal)					RC		RC		RC		
CO	Local Audits (SDAPCD)					3/9, 6/9, 9/2, 10/14		12/20		2/17		
CO	State Audits (ARB)					n/a		5/26		5/27		
CO	Equipment Manufacturer Model					Thermo 48i-TLE		Thermo 48i		Thermo 48i		
NO_2	Monitor Designation	PAMS, SLAMS	PAMS, SLAMS	SLAMS		PAMS, SLAMS	NCore	SLAMS	SLAMS	SLAMS	PAMS, SLAMS	
NO_2	Sampling Method	CL	CL	CL		CL	CL	CL	CL	CL	CL	
NO_2	Spatial Scale	US	NS	NS		NS	NS	NS	MI	NS	NS	
NO_2	Monitoring Objective (federal)	RC	BL	RC		RC	RC	RC	IM	RC	RC	
NO_2	Local Audits (SDAPCD)	10/19	9/28	6/21		8/30, 12/28	3/10, 6/10, 9/13, 12/29	12/9	10/26	3/2	6/16	
NO_2	State Audits (ARB)	5/18	not done	5/17		5/19	n/a	5/26	5/16	5/27	not done	
NO_2	Equipment Manufacturer/Model	Thermo 42C	Thermo 42	Thermo 42		Thermo 42C	Thermo 42i-NOy	Thermo 42	Thermo 42	Thermo 42	Thermo 42	
SO_2	Monitor Designation			SLAMS		NCore			SLAMS	SLAMS		
SO_2	Sampling Method			FL		FL			FL	FL		
SO_2	Spatial Scale			NS		NS			NS	NS		
SO_2	Monitoring Objective (federal)			RC		RC			RC	RC		
SO_2	Local Audits (SDAPCD)			4/11		3/3, 6/7, 8/26, 9/30, 10/7,			closed before audit	2/4		
SO_2	State Audits (ARB)			5/17		n/a			5/16	5/27		
SO_2	Equipment Manufacturer/Model			Thermo 43A		Thermo 43i-TLE			Thermo 43C	Thermo 43A		

GLOSSARY OF TERMS

Monitor Designation

- PAMS — Photochemical Assessment Monitoring
- SLAMS — State and Local Air Monitoring Stations
- SPM — Special Purpose Monitoring
- NCore — National Core
- QA — Quality Assurance collocated
- CSN — Supplemental Speciation-Chemical Speciation Network
- STN — Supplemental Speciation-Speciation Trends Network
- CSM — Community Scale Monitoring (SDAPCD)
- CA TAC — California Toxics Air Contaminant Monitoring

Sampling or Analysis Method

- CL — Chemiluminescence
- CT — Low volume, continuous sampler, size selective inlet
- 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
- IPMS — Inductively Coupled Plasma-Mass Spectrometer

Spatial Scale

- MI — Micro Scale
- MS — Middle 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] The El Cajon station has instruments for the NCore program SO_2-TLE, CO-TLE, NO_y

All monitors operate on a continuous (7 / 24) basis.

Section 15.0.0 Data Submittal Introduction

The District 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). The data analyses are conducted in accordance with the 40 CFR Part 58, Appendix A. Each year the District certifies the data that have been submitted to AQS (called a Certification Letter). This Certification Letter confirms that the data complies with all 40 CFR Part 58 guidelines and regulations pertaining to data quality assurance and data completeness. The Certification Letter must include a summary report of the precision and accuracy for each monitor. All Toxics, PAMS, and CSM (also called Supplemental Speciation) data are likewise included.

Section 15.1.0 Data Submittal per Quarter

Table 15.1 summarizes all the data that must be uploaded into the AQS on a quarterly basis.

Table 15.1 Data Submittal to AQS Quarterly

Data Submittal		QA-Collocation		QA-Audits		QC-Calibrations††		QC-One PointChecks	
Pollutant	2011	Pollutant	2011	Pollutant	2011	Pollutant	2011	Pollutant	2011
PM_{10}	✓	PM_{10}	✓	PM_{10}	✓	PM_{10}	✓		
$PM_{2.5}$, Sequential**	✓	$PM_{2.5}$, Sequential**	✓	$PM_{2.5}$, Sequential	✓	$PM_{2.5}$, Sequential	✓		
$PM_{2.5}$, Continuous	✓	$PM_{2.5}$, Continuous	✓	$PM_{2.5}$, Continuous	✓	$PM_{2.5}$, Continuous	✓		
Pb-TSP	†	Pb-TSP	†	Pb-TSP	†	Pb-TSP	†		
O_3	✓			O_3	✓	O_3	✓	O_3	✓
NO_2	✓			NO_2	✓	NO_2	✓	NO_2	✓
SO_2	✓			SO_2	✓	SO_2	✓	SO_2	✓
CO	✓			CO	✓	CO	✓	CO	✓
NOy- NCore	✓			NOy- NCore	✓	NOy- NCore	✓	NOy- NCore	✓
CO-NCore	✓			CO-NCore	✓	CO-NCore	✓	CO-NCore	✓
SO_2-NCore	✓			SO_2-NCore	✓	SO_2-NCore	✓	SO_2-NCore	✓

* The District processes $PM_{2.5}$ filters for Kern and Imperial County. All official decisions regarding the data are made by the appointed authority of those Counties.

** The District submits $PM_{2.5}$ accuracy data for Imperial County. All official decisions regarding the data are made by the appointed authority from Imperial County.

†The Pb-TSP samplers were sited, the platforms constructed, and in-place, in the 4th quarter of 2011, but not fully operational until the 1st Quarter of 2012, so there was no data to upload.

††The QC Calibrations are not uploaded into AQS, but are stored in the District's internal database.

Section 15.2.0 Data Submittal per Year

Table 15.1b Summarizes all the data that must be uploaded into the AQS annually.

Table 15.2 Data Submittal to AQS Yearly

Data Submittal	
Program	2011
Data Certification Letter	✓
PAMS-VOCs	✓
PAMS-Carbonyls	✓
Supplemental Speciation-Toxics-VOCs	✓
Supplemental Speciation-Carbon Speciation	✓

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