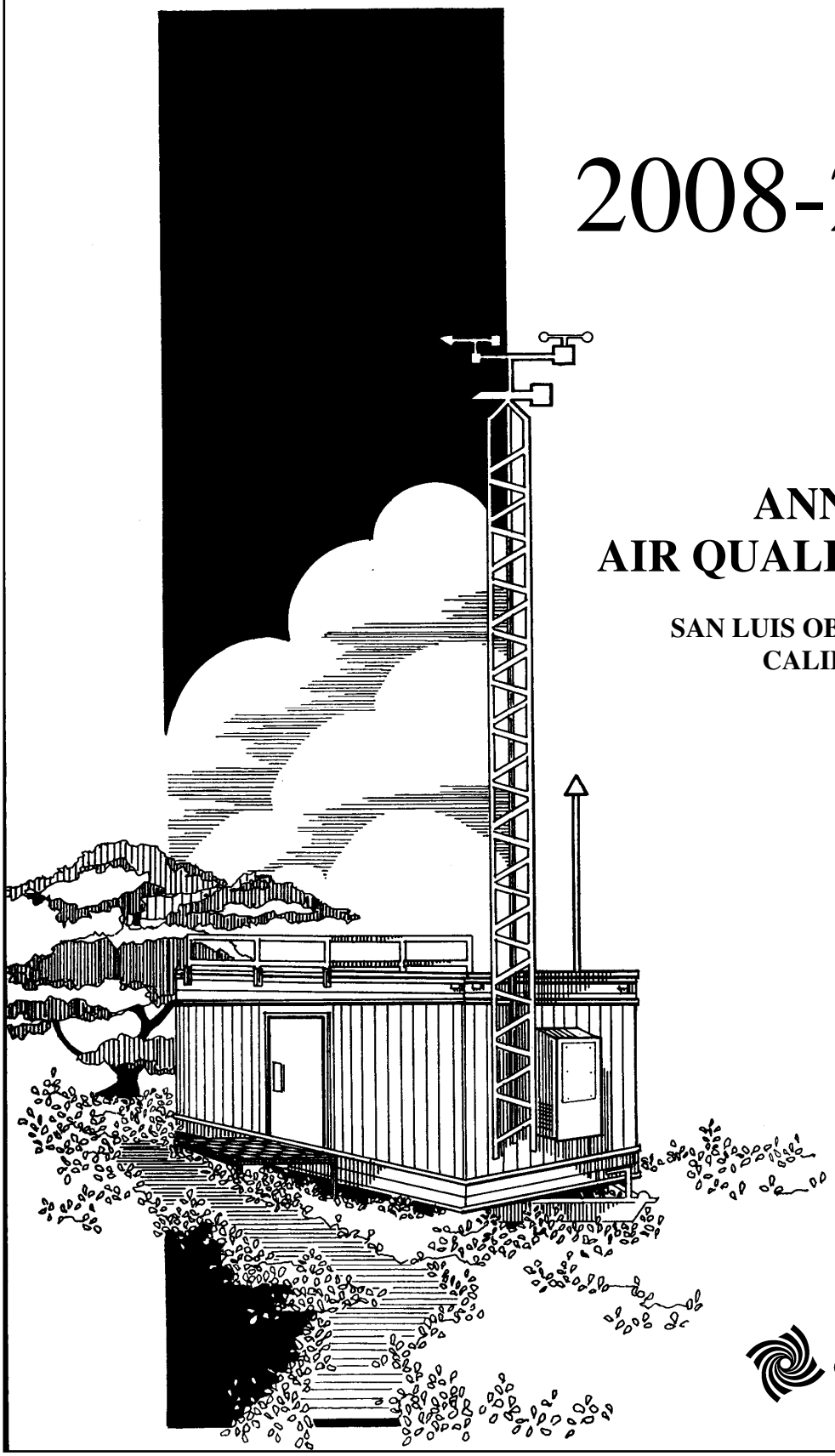
2008-2009

ANNUAL AIR QUALITY REPORT

SAN LUIS OBISPO COUNTY
CALIFORNIA



AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN LUIS OBISPO

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2008-2009 Annual Air Quality Report
Published July 2010
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The air quality database for San Luis Obispo County is a public record and is available from the APCD office in various forms, including comprehensive records of all hourly or other sample values acquired anywhere in the county. Data summaries are published in Annual Air Quality Reports like this one. Ozone summary data appear weekly in the Saturday edition of the San Luis Obispo County Tribune, a local newspaper. Each month's data from ambient monitoring is added to separate archives maintained by the federal Environmental Protection Agency (EPA) and by the Air Resources Board (ARB). Summary data from San Luis Obispo County can be found in EPA and ARB publications and on the world wide web at the following websites:

www.slocleanair.org
SLO APCD website
www.arb.ca.gov
ARB website
www.epa.gov
US EPA website
www.airnow.gov
Air Quality Index site

2008-2009 Combined Air Quality Report

The San Luis Obispo County Air Pollution Control District (APCD) combined the 2008 and 2009 air quality reports in order to include information on the South County Phase 2 Particulate Study, the new Federal ozone air quality standard, exceptional event documentation and to update previous Annual Report data presentations.

South County Phase 2 Particulate Matter Study

Historical ambient air monitoring on the Nipomo Mesa has documented numerous occurrences of elevated concentrations of airborne particulate matter (PM) at levels exceeding ambient air quality standards that may cause adverse health effects in children, the elderly, those with compromised respiratory or cardiovascular systems, and the general population. To better understand the extent and sources of these elevated PM levels on the Mesa, the District conducted comprehensive air monitoring studies in that region and prepared the Nipomo Mesa Particulate Study report (now known as the Phase 1 Study Report) that was presented to the District Board in 2007. The Phase 1 Study Report identified the coastal sand dunes upwind of the Mesa as the primary source of particulate emissions contributing to the high PM levels measured in the study; however, the findings were inconclusive regarding whether off highway vehicle activity at Oceano Dunes State Vehicular Recreation Area (ODSVRA) was a contributing factor. Thus, the District Board directed District staff to prepare a Phase 2 Study to ascertain whether OHV activity at the ODSVRA contributes to the high PM10 levels measured on the Nipomo Mesa.

The District conducted extensive additional air monitoring and other analyses as directed by the Board in 2008 and 2009. Extensive analysis of the study data resulted in a conclusive finding that offroad vehicle activity at the ODSVRA is a major contributing factor to the high PM concentrations observed on the Mesa. A unexpected finding of the study showed respirable particulate matter even smaller than PM_{10} is a component of the particulate measured on the Nipomo Mesa, which prompted review of current and future monitoring for $PM_{2.5}$ (fine particulate matter 2.5 microns or less in aerodynamic diameter).

The Phase 2 PM Study Report was published in February 2010 and the results presented to the Board at their March 24, 2010 meeting. The Board has since directed staff to implement a Memorandum of Agreement Between APCD, the County and State Parks to identify the specific details of how a mitigation plan would be developed and implemented to reduce PM emissions from the SVRA; they have also directed staff to concurrently proceed with development and adoption of a Fugitive Dust Regulation.

The completed study report and technical appendices have been published and are available in Arroyo Grande, San Luis Obispo and Paso Robles public libraries, and can also be downloaded from the APCD website at *www.slocleanair.org*.

New Federal Ozone Standard

On March 12, 2008, the Environmental Protection Agency (EPA) significantly strengthened its national ambient air quality standards (NAAQS) for ground-level ozone, the primary component of smog. These changes improved both public health protection and the protection of sensitive trees and plants. EPA revised the 8-hour "primary" ozone standard, designed to protect public health, to a level of 0.075 parts per million (ppm). The previous standard, set in 1997, was 0.08 ppm. Because ozone is measured out to three decimal places, the standard effectively became 0.084 ppm as a result of rounding. Ozone concentrations exceeding 0.075 ppm are regularly measured at our Red Hills and Carrizo Plains monitoring sites in the eastern portion of the county. As a result, we are likely to be designated as nonattainment for the federal ozone standard later this year.

EPA also strengthened the secondary 8-hour ozone standard to the level of 0.075 ppm making it identical to the revised primary standard. EPA decided to strengthen the secondary ozone standard after concluding that the 1997 secondary standard was not adequate to protect public welfare. Current ozone air quality concentrations in many areas of the country -- including some areas that meet the 1997 ozone standards -- are high enough to harm sensitive vegetation and ecosystems.

EPA estimates that the revised standards will yield health benefits valued between $2 billion and $17 billion. Those benefits include preventing cases of bronchitis, aggravated asthma, hospital and emergency room visits, nonfatal heart attacks and premature death, among others.

In addition, EPA changed the Air Quality Index (AQI) to reflect the new primary standard. The AQI is EPA's color-coded tool designed for use by state and local authorities to inform the public about daily air pollution levels in their communities.

San Luis Obispo County has been designated as a non-attainment area for the state 8-hour ozone standard. The State Air Resources Board (ARB) and the San Luis Obispo County Air Pollution Control District (SLOAPCD) are now working with the EPA on San Luis Obispo County's expected non-attainment designation for the Federal 8-hour ozone standard, likely to occur in August 2010.

Exceptional Event Documentation

Exceptional events are air quality events for which the normal planning and regulatory process established by the Clean Air Act (CAA) is not appropriate. Air quality monitoring data influenced by exceptional events can be excluded from regulatory determinations related to exceedances or violations of the National Ambient Air Quality Standards (NAAQS). In addition, the EPA can avoid designating an area as non-attainment, redesignating an area as non-attainment, or reclassifying an existing non-attainment area to a higher classification if a state or local air quality agency adequately demonstrates that an exceptional event has caused an exceedance or violation of a NAAQS. EPA defines the term "exceptional event" to mean an event that impacts air quality; that is not reasonably controllable or preventable; that is unlikely to recur at a particular location; and is an event caused by human activity or by natural causes. Wildfires can be considered exceptional events.

The June and July 2008 wildfires in Santa Barbara county produced ozone precursor emissions which significantly impacted ambient ozone measurements in San Luis Obispo County. Documents were submitted by the San Luis Obispo County Air Pollution Control District to the California Air Resources Board to demonstrate that these wildfire impacts to our air quality meet the criteria for an exceptional event as defined by federal policies. These documents present a general overview of the 2008 wildfire event using satellite images and smoke models and additional analyses to demonstrate the exceptional nature of the wildfires impact on ozone measurements in San Luis Obispo County. Copies of these reports can be obtained on the APCD website and by directly contacting the APCD.

The APCD makes every effort to present complete and accurate air quality data in the Annual Report. After exceptional event data days are accepted by EPA, Annual Report data presentations will be revised to show these data days were excluded from the counts of days or hours exceeding or in violation of a NAAQS. In the interest of accuracy and comprehensiveness the District includes all valid measured concentrations in this report including those pending review by the USEPA. For this reason data in this report must be considered preliminary.

Air Quality Monitoring and Data

San Luis Obispo County air quality was measured in 2008 and 2009 by a network of eleven ambient air monitoring stations. Station locations are depicted on the map on page 8. The APCD operated six permanent stations at Nipomo Regional Park, Grover Beach, Morro Bay, Atascadero, Red Hills and Carrizo Plains. The State Air Resources Board (ARB) operated stations at San Luis Obispo and Paso Robles. One station on the Nipomo Mesa was operated by the District for the ConocoPhillips refinery in 2008 and 2009. Two more special purpose PM_{10} monitoring stations were operated at Hillview and CDF on the Nipomo Mesa.

In 2009 the ARB placed a PM_{10} Beta Attenuation Monitor (BAM) 1020a continuous sampler at the Paso Robles monitoring station which began reporting in August. In 2009 the APCD placed a $PM_{2.5}$ BAM 1020a at the Atascadero monitoring station which began reporting in June. APCD placed a $PM_{2.5}$ BAM 1020a at the Mesa2 monitoring station which began reporting in July 2009 and placed a PM_{10} BAM 1020a which began reporting in October 2009. BAM data is reflected in the 2009 PM table listing the highest concentrations and the annual means and used in the PM_{10} Trend graph.

Air quality monitoring is rigorously controlled by federal and state quality assurance and control procedures to ensure data validity. Gaseous pollutant levels are measured continuously and averaged each hour, 24 hours a day. Particulate pollutants are generally sampled continuously using the BAM samplers described above, or by filter techniques for averaging periods of 24 hours. The filter technique is a manual sampling method for PM_{10} (respirable particulate matter 10 microns or less in size) and $PM_{2.5}$ (fine particulate matter 2.5 microns or less in size) whereby PM samples are collected on filter media for 24 hours every sixth day on the same schedule nationwide.

*While ground level **ozone** is harmful to plants and animals and is considered a pollutant, upper level (stratospheric) ozone occurs naturally and protects the earth from harmful ultra-violet energy from the sun.*

***Fine particulate matter**, research suggests, is much more detrimental to human health than previously thought. In addition, it can greatly reduce visibility.*

***NO_2** and **SO_2** create aerosols, which may fall as acid rain causing damage to crops, forests, and lakes.*

***CO** is a colorless, odorless gas that can lower the blood's ability to carry oxygen.*

Ambient Air Pollutants Of Local Concern

Ozone

Although ozone occurs naturally at low concentrations near the earth's surface, much higher and unhealthful levels are created when airborne mixtures of hydrocarbons and oxides of nitrogen are driven by sunlight to react, forming ozone pollution. The emissions of these ozone precursor pollutants come from many human activities, but primarily from industry and the wide use of motor vehicles. As a pollutant, ozone is a strong oxidant gas which attacks plant and animal tissues. It causes impaired breathing and reduced lung capacity, especially among children, athletes and persons with compromised respiratory systems. It also causes significant crop and forest damage. Ozone is a pollutant of particular concern in California where geography, climate and high population densities contribute to frequent violations of health-based air quality standards.

Particulate Matter

Ambient air quality standards have been established for two classes of particulate matter: PM_{10} (respirable particulate matter less than 10 microns in aerodynamic diameter), and $PM_{2.5}$ (fine particulate matter 2.5 microns or less in aerodynamic diameter). Both consist of many different types of particles that vary in their chemical activity and toxicity. $PM_{2.5}$ tends to be a greater health risk since it cannot be removed from the lungs once it is deeply inhaled. Sources of particulate pollution include: diesel exhaust, mineral extraction and production; combustion products from industry and motor vehicles; demolition and construction; agricultural operations; smoke from open burning; paved and unpaved roads; condensation of gaseous pollutants into liquid or solid particles; and natural sources such as wind-blown dust.

NO_2, SO_2, CO

Nitrogen dioxide (NO_2) is the brownish-colored component of smog. NO_2 irritates the eyes, nose and throat, and can damage lung tissues. Sulfur dioxide (SO_2) is a colorless gas with health effects similar to NO_2. Both pollutants are generated by fossil fuel combustion from mobile sources (such as vehicles, ships and aircraft), and at stationary sources (such as industry, homes and businesses). SO_2 may also be emitted by petroleum production and refining operations. The state and national standards for NO_2 have never been exceeded in this county. The state standard for SO_2 was exceeded periodically on the Nipomo Mesa up until 1993. Equipment and processes at the facilities responsible for the emissions were upgraded as a result, and the state SO_2 standard has not been exceeded since that time. Exceedances of the federal SO2 standard have never been measured here.

Carbon monoxide (CO) can cause headaches and fatigue and results from fuel combustion of all types. Motor vehicles are by far the chief contributor of CO in outdoor air. State CO standards have not been exceeded in San Luis Obispo County since 1975

Map of San Luis Obispo County

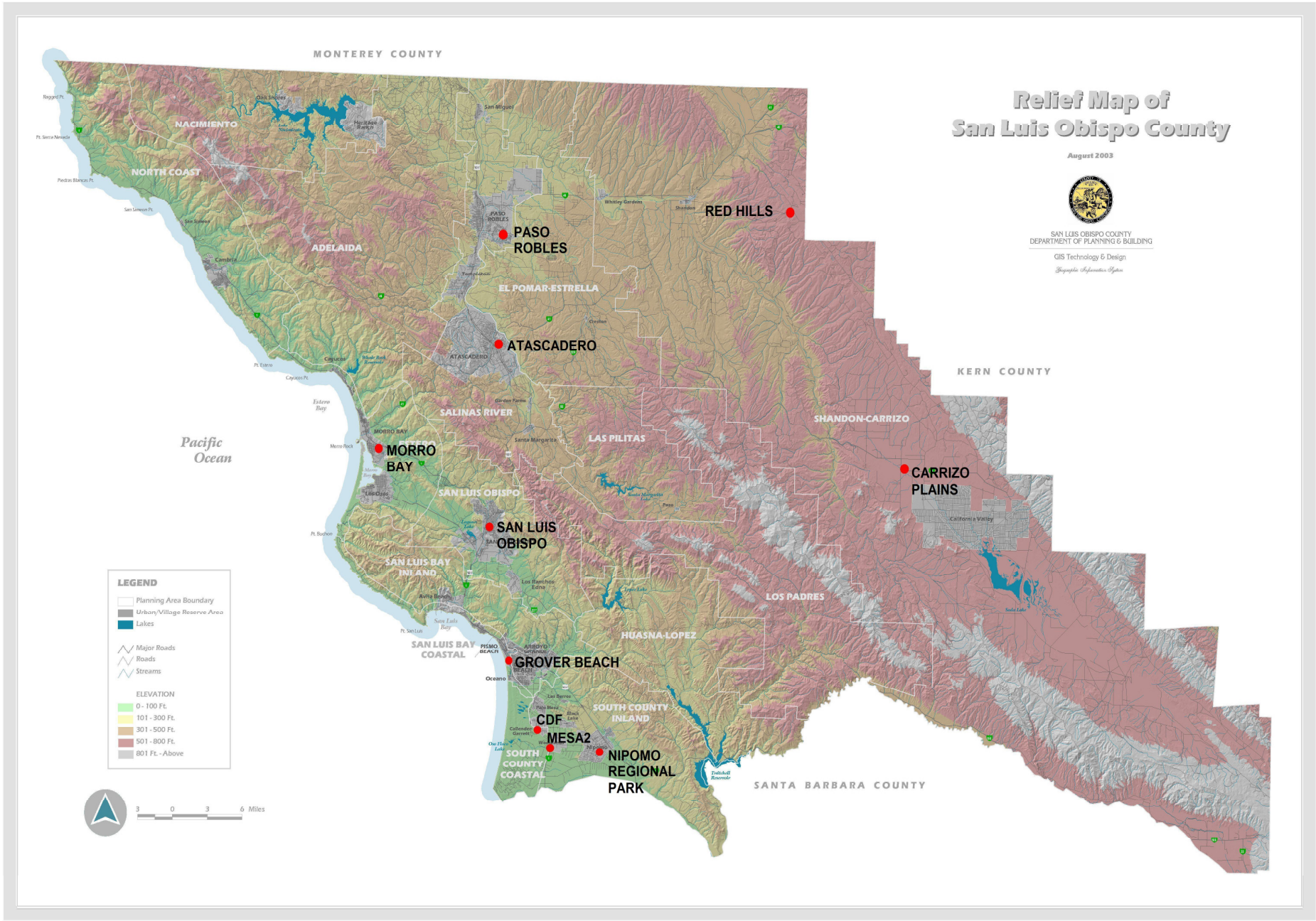


Table 1: Ambient Air Quality Parameters Monitored in SLO County in 2008 & 2009

	O_3	NO	NO_2	NOx	SO_2	CO	PM_{10}	$PM_{2.5}$	BAM	WS	WD	ATM
APCD Permanent Stations												
Atascadero	X	X	X	X			X	X	**$PM_{2.5}$**	X	X	X
Morro Bay	X	X	X	X			X			X	X	
Nipomo Reg. Park	X	X	X	X			X			X	X	X
Red Hills	X									X	X	X
Carrizo Plains	X									X	X	X
South County Special Study Sites												
Hillview							X					
CDF							X					
ARB Stations												
San Luis Obispo	X						X	X		X	X	X
Paso Robles	X						X		**PM_{10}**	X	X	X
Operated by APCD												
Mesa 2, Nipomo					X		X		**$PM_{2.5}$** **PM_{10}**	X	X	X
Grover Beach										X	X	

Notes:

- Grover Beach is operated as a meteorology station only.
- CDF was added as a special study monitoring station and reported as a part of the South County Phase 2 Particulate Study
- Hillview was shutdown in 2009.
- The PM_{10} and $PM_{2.5}$ columns represent filter-based hi-vol samplers in place 2008-2009. See text for discussion.
- The BAM column represents BAM 1020a samplers by type in place 2009. See text for discussion.

Acronyms:

O_3	Ozone	SO_2	Sulfur Dioxide	PM_{10}	Particulates < 10 microns (samples every sixth day)	WS	Wind Speed
NO	Nitric Oxide	CO	Carbon Monoxide			WD	Wind Direction
NO_2	Nitrogen Dioxide	TEOM	Particulates <10 microns (monitored continuously)	$PM_{2.5}$	Particulates < 2.5 microns (samples every sixth day)	ATM	Ambient Temp
NOx	Oxides of Nitrogen						

Table 2: Ambient Air Quality Standards in 2008 and 2009

The factors that lead to ozone formation are very complex and include: climate, topography, emissions of precursor pollutants, and pollutant transport. Air quality monitoring has shown that ozone levels can be very different from year to year. The reasons for this are not fully understood and are the subject of ongoing research.

***A standard exceedance** occurs when a measured value meets exceedance criteria prescribed by state or federal agencies and does not necessarily constitute a violation.*

***A standard violation** may occur following a single or cumulative series of standard exceedances. Criteria constituting a violation are unique for each pollutant and may result in changes to an area's attainment status.*

Pollutant	Averaging Time	California Standard	National Standard
Ozone (O3)	1 Hour	0.09 ppm	-----
	8 Hour	0.070 ppm	0.075 ppm*
Respirable Particulate Matter (PM_{10})	24 Hour	50 ug/m^3	150 ug/m^3
	Annual Arithmetic Mean	20 ug/m^3	-------
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	-----	35 ug/m^3
	Annual Arithmetic Mean	12 ug/m^3	15 ug/m^3
Carbon Monoxide (CO)	8 Hour	9.0 ppm	9 ppm
	1 Hour	20 ppm	35 ppm
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm	0.053 ppm
	1 hour	0.18 ppm	-----
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	-----	0.030 ppm (primary)
	24 Hour	0.04 ppm	0.14 ppm (primary)
	3 Hour	-----	0.5 ppm (secondary)
	1 Hour	0.25 ppm	-----
Hydrogen Sulfide (H_2S)	1 Hour	0.03 ppm	-----
Visibility	8 hour	Sufficient amount to reduce the prevailing visibility to less than ten miles when the relative humidity is less than 70 %.	

*Updated in 2008 from 0.08 to 0.075 ppm

2008 Air Quality Summary

Although most populated areas of San Luis Obispo County enjoyed good air quality this year, ozone levels exceeding both federal and state standards were measured on numerous days in the rural eastern portion of the county due to transported pollution; a few exceedances also occurred in the north county inland and other areas due to locally formed emissions as well as transported pollution from wildfires. Combined smoke impacts from the fires in Santa Cruz, Monterey, Santa Barbara County, Los Angeles counties as well as the northern and central California fires were felt for seven months in 2008 starting in May. County-wide Health Advisories were issued for smoke impacts from the fires by San Luis Obispo County's Health Officer and Air Pollution Control Officer starting in May 2008 and were not lifted until November 2008.

Ozone and Particulate Matter Data Summary

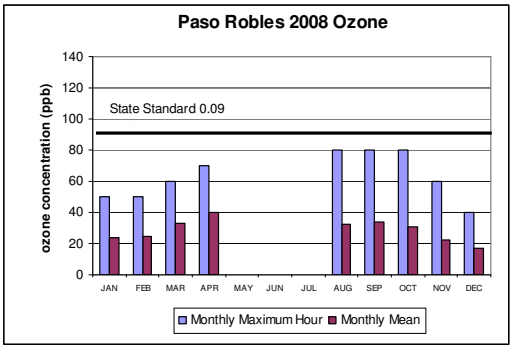
Forty-three days exceeding the new federal 8-hour ozone standard of 0.075 parts per million (ppm) were recorded in 2008: Twenty-two federal 8-hour exceedance days were recorded at the Carrizo Plains station, thirty-nine exceedance days at the Red Hills station and one exceedance day each at the Atascadero, Morro Bay and San Luis Obispo stations. Exceedance of the more stringent state 8-hour ozone standard of 0.070 ppm occurred on seventy-two days: forty-five days at the Carrizo Plains station; sixty-five days at the Red Hills station; two days at Atascadero; two days at San Luis Obispo and one exceedance day each was recorded at the Morro Bay and Nipomo stations. Seven days exceeding the state one hour ozone standard of 0.09 ppm were recorded in 2008: four exceedance days at the Red Hills station, four exceedance days at the Carrizo Plains station and one exceedance day at the San Luis Obispo station.

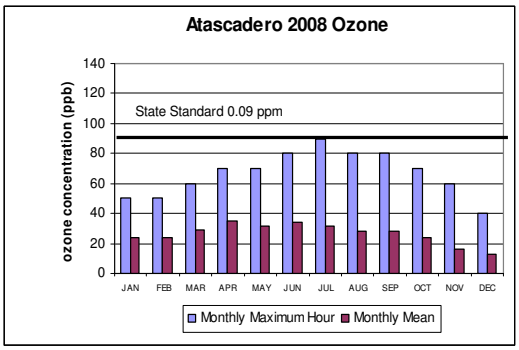
Countywide, exceedances of the state 24 hour PM_{10} standard of 50 ug/m^3 occurred twenty-six times out of 60 different sample days. Statistically, this is equivalent to 156 exceedance days for 2008 since sampling is only conducted once every six days. One exceedance day was recorded at the Nipomo Regional Park station. Five exceedance days were recorded at the Nipomo Mesa 2 station. Seventeen exceedance days were recorded at the Hillview station. Two exceedance days were recorded at the Morro Bay station. One exceedance day was recorded at the Paso Robles station. On October 9, 2008 stations at Morro Bay, Nipomo Regional Park, Nipomo Mesa and Hillview all recorded an exceedance of the state PM_{10} standard due to smoke from wildfires. Other 2008 exceedances days at Morro Bay, Paso Robles and Nipomo Mesa may also have been a result of particulate matter from the wildfires. There was no measured exceedance of state or federal $PM_{2.5}$ standards or the federal air quality standard for PM_{10} in 2008.

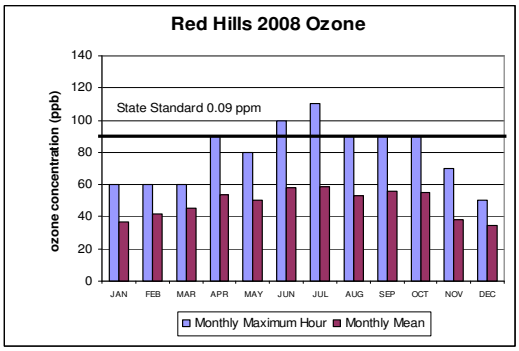
In San Luis Obispo County, ozone and PM_{10} are the pollutants of main concern, since exceedances of health-based standards for those are experienced here in most years. Our county is designated as a non-attainment area for the state PM_{10} standard.

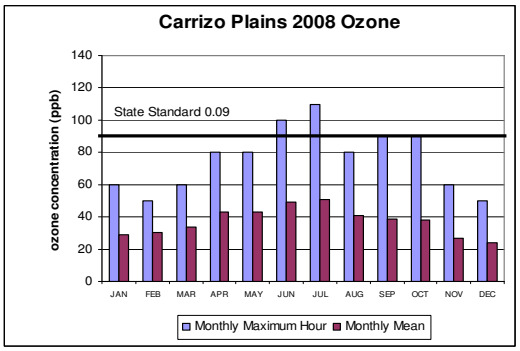
2008 Ozone

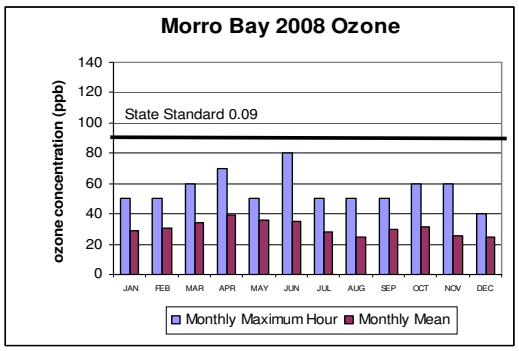
The following graphs depict 2008 monthly ozone concentrations at seven monitoring stations in the county. There are two data bars presented for each month. The monthly maximum hour bar shows the highest hourly average concentration during the month in parts per billion (ppb). The monthly mean bar is a monthly average concentration and depicts average ozone intensity (in ppb) for the month. Due to data integrity issues the Paso Robles ozone monitoring system was shutdown for maintenance in May, June and July, so data for that period is not available.

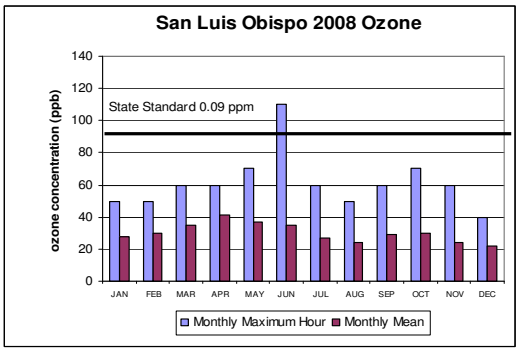


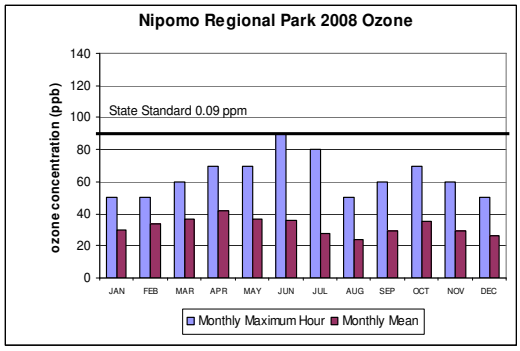






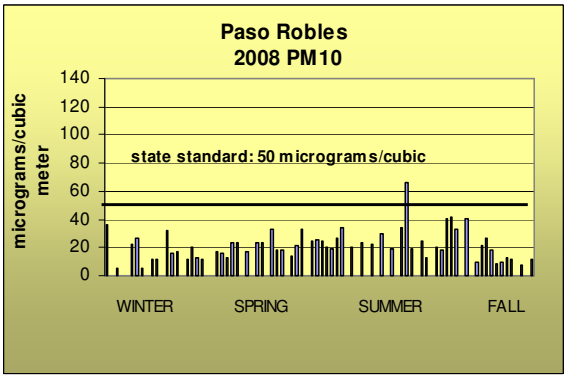


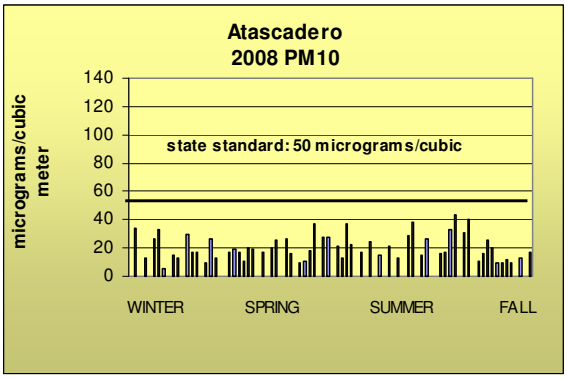


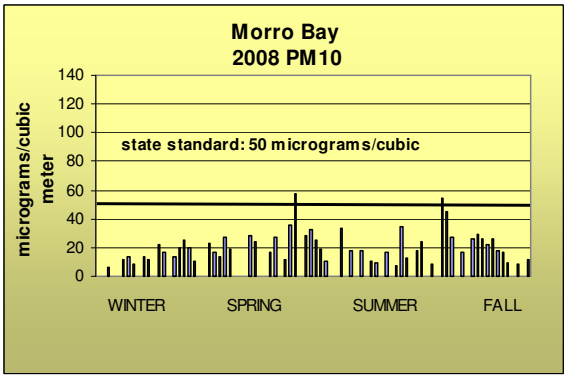


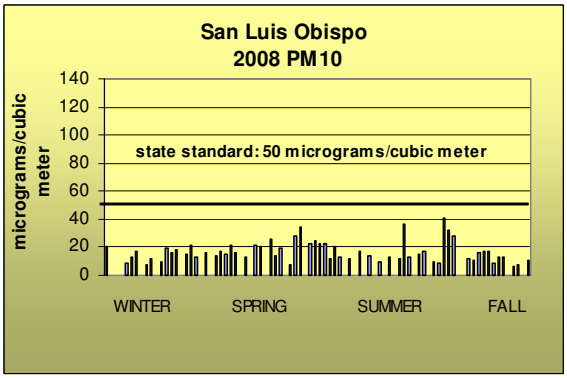
2008 Particulate Matter, 10 Microns or less (PM_{10})

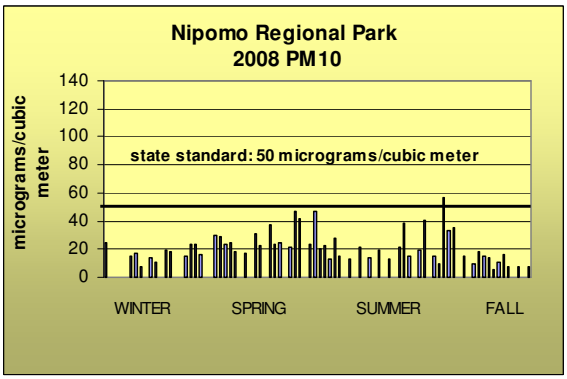
The graphs on this page present 2008 PM_{10} particulate data from seven station locations. Missing data bars represent monitor outages or periods where data did not meet quality assurance standards.

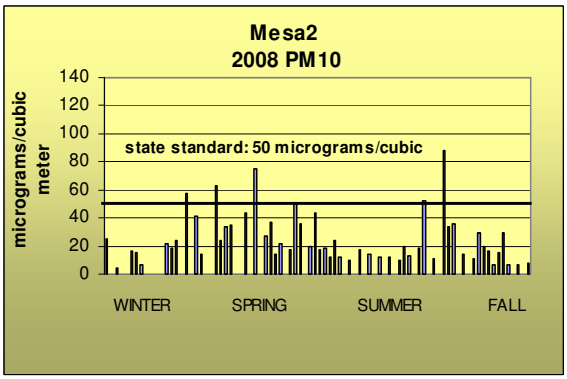


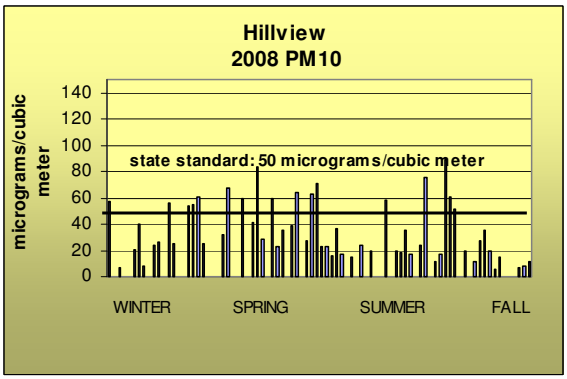






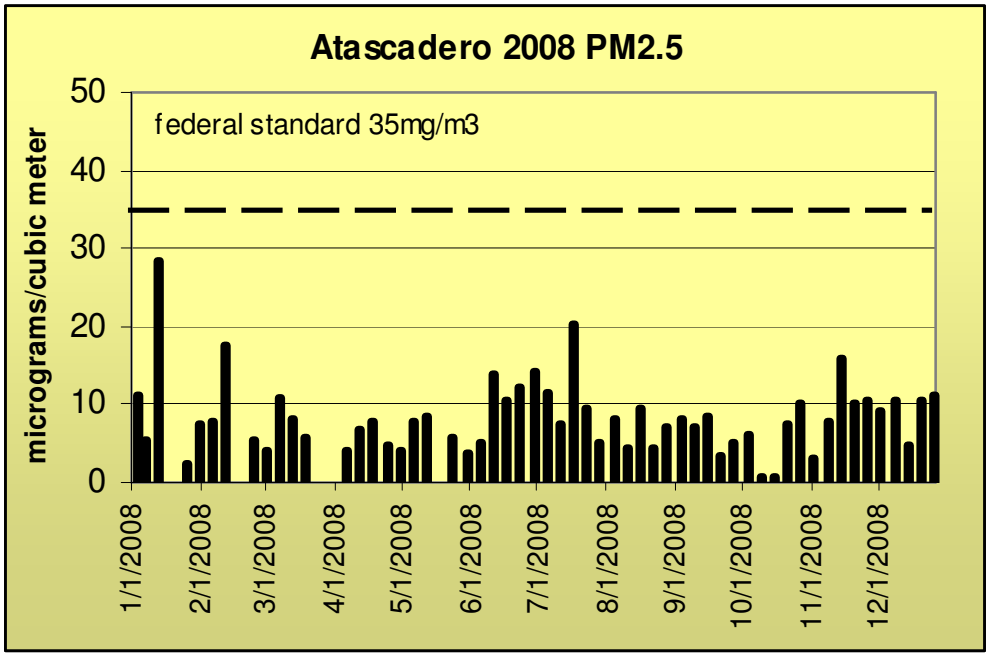






2008 Particulate Matter, 2.5 Microns or Less ($PM_{2.5}$)

Monitoring for fine particulate matter ($PM_{2.5}$) began in 1999 and is performed at two locations in San Luis Obispo and Atascadero. The federal standard for $PM_{2.5}$ of 35 micrograms per cubic meter was not exceeded during 2008. California has not set a 24 hour $PM_{2.5}$ standard. Missing data bars represent monitor outages or periods where data did not meet quality assurance standards.



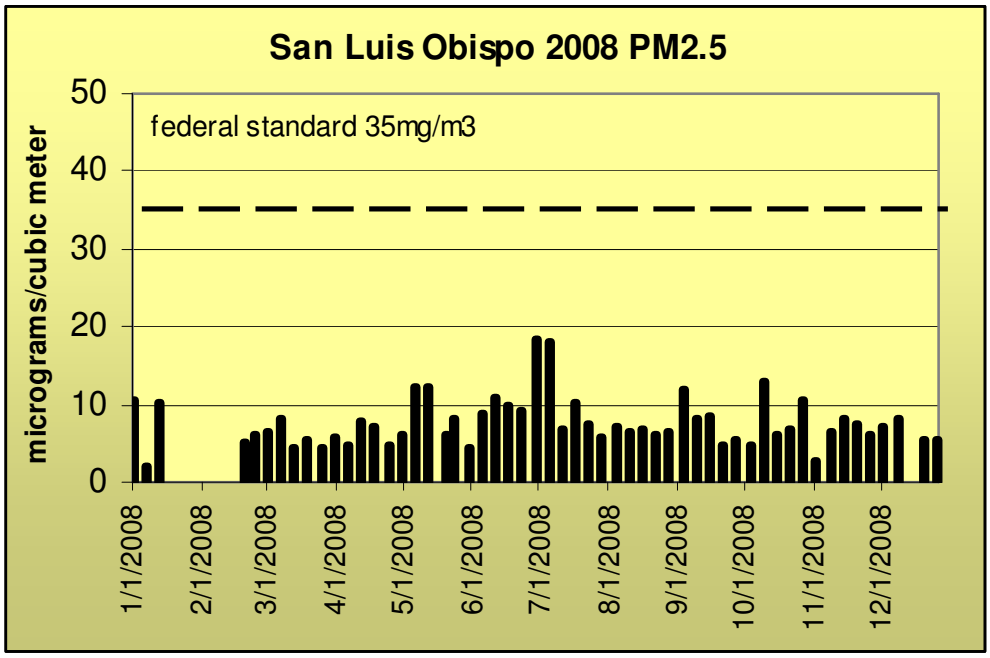


Table 3: First, Second and Third Highest Hourly Averages for 2008

The following table lists the highest hourly (and 8-hour for ozone) concentrations (expressed in parts per million) recorded in 2008 for ozone, sulfur dioxide and nitrogen dioxide at the stations where they are monitored. Sampling date and hour appears with each data value in the format of month/day: hour.

Station	O_3 1-hour			O_3 8-hour			SO_2			NO_2		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Paso Robles	**.080** 08/13:12	**.078** 08/28:13	**.078** 10/28:13	**.070** 08/28:10	**.069** 09/06:10	**.066** 09/05:10						
Atascadero	**.087** 07/26:15	**.085** 07/25:12	**.081** 07/08:11	**.079** 07/26:11	**.072** 07/25:10	**.070** 09/06:10				**.052** 10/28:18	**.048** 10/29:18	**.047** 10/24:18
Morro Bay	**.070** 06/19:15	**.066** 04/27:09	**.066** 06/21:11	**.060** 04/12:10	**.059** 04/11:10	**.058** 11/23:13				**.045** 11/17:07	**.037** 10/24:07	**.036** 01/02:17
San Luis Obispo	**.109** 06/19:15	**.082** 06/20:17	**.069** 05/14:14	**.076** 06/19:11	**.073** 06/20:14	**.060** 04/11:11						
Red Hills	**.109** 07/08:16	**.109** 07/09:14	**.100** 06/13:21	**.097** 07/08:10	**.096** 07/09:10	**.092** 06/13:19						
Carrizo Plains	**.111** 07/08:18	**.099** 06/28:10	**.098** 07/09:13	**.093** 0709:09	**.090** 06/27:09	**.089** 07/08:11						
Nipomo Regional Park	**.092** 06/19:18	**.078** 06/20:15	**.075** 07/26:15	**.072** 06/19:11	**.070** 06/20:12	**.066** 04/11:11				**.050** 10/16:20	**.047** 11/17:19	**.045** 10/16:21
Nipomo, Mesa 2							**.047** 03/25:16	**.039** 04/25:13	**.038** 03/25:17			

Table 4: Summary of Particulate Matter Concentrations for 2008

The following table lists the highest concentrations and the annual means recorded in 2008 for PM_{10} and $PM_{2.5}$ particulate matter at the stations where they are monitored. Values are in micrograms/cubic meter. Values exceeding state or federal standards are in bold.

2008	PM_{10}		$PM_{2.5}$	
	Highest Concentration	Annual Arithmetic Mean	Highest Concentration	Annual Arithmetic Mean
Paso Robles	**66 ug/M^3** 09/03	**22.3 ug/M^3**		
Atascadero	44 ug/M^3 10/15	**20.5ug/M^3**	28.5 ug/M^3 01/13	8.3 ug/M^3
Morro Bay	**60ug/M^3** 06/11	**21.5ug/M^3**		
San Luis Obispo	42 ug/M^3 10/09	17.5ug/M^3	18.4 ug/M^3 06/29	7.6 ug/M^3
Nipomo Regional Park	**58 ug/M^3** 10/09	**21.2ug/M^3**		
Nipomo, Mesa2	**91 ug/M^3** 10/09	**25.5ug/M^3**		
Hillview, Nipomo	**92ug/M^3** 10/09	**35.8ug/M^3**		

2009 Air Quality Summary

Most populated areas of San Luis Obispo County again enjoyed good air quality during 2009, although ozone levels exceeding both federal and state standards were measured on numerous days in the rural eastern portion of the county due to transported pollution; a few exceedances also occurred in the north county inland and other areas due to locally formed emissions as well as transported pollution from wildfires. As in 2008 combined smoke impacts in 2009 from the fires in Santa Barbara County, Santa Cruz and Monterey were experienced in San Luis Obispo County. County-wide Health Advisories were issued in August 2009 for smoke impacts from these fires.

Ozone and Particulate Matter Data Summary

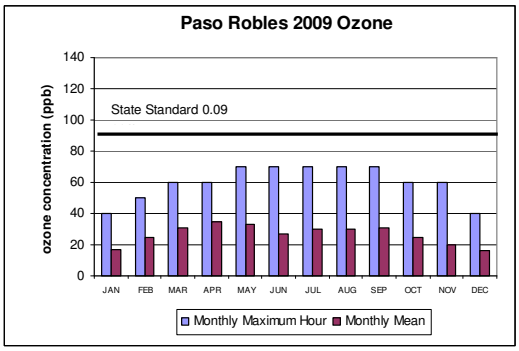
Eight days exceeding the federal 8-hour ozone standard of 0.075 parts per million (ppm) were recorded in 2009: Three federal 8-hour exceedance days were recorded at the Carrizo Plains station and seven exceedance days at the Red Hills station. Exceedance of the more stringent state 8-hour ozone standard of 0.070 ppm occurred on twenty-seven days: eleven days at the Carrizo Plains station and twenty-one days at the Red Hills station were recorded. No days exceeding the state one hour ozone standard of 0.09 ppm were recorded in 2009.

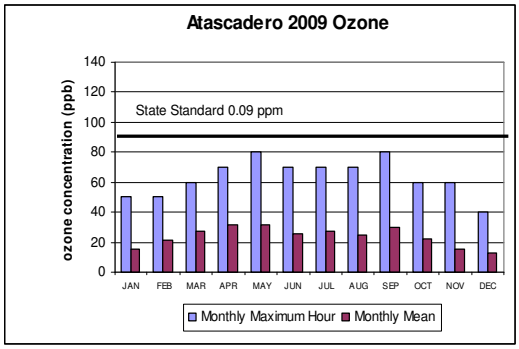
Countywide, exceedances of the state 24 hour PM_{10} standard of 50 ug/m^3 occurred fourteen times out of 60 different sample days. Statistically, this is equivalent to 84 exceedance days for 2009 since sampling is only conducted once every six days. Two exceedance days was recorded at the Nipomo Regional Park station. Nine exceedance days were recorded at the Nipomo Mesa 2 station. Two exceedance days were recorded at the Hillview station before it was shut down after March 2009. One exceedance day was recorded at the Morro Bay station. There was no measured exceedance of state or federal $PM_{2.5}$ standards or the federal air quality standard for PM_{10} in 2009.

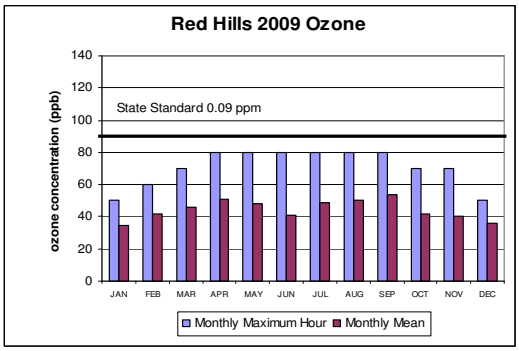
In San Luis Obispo County, ozone and PM_{10} are the pollutants of main concern, since exceedances of health-based standards for those are experienced here in most years. Our county is designated as a non-attainment area for the state PM_{10} standard.

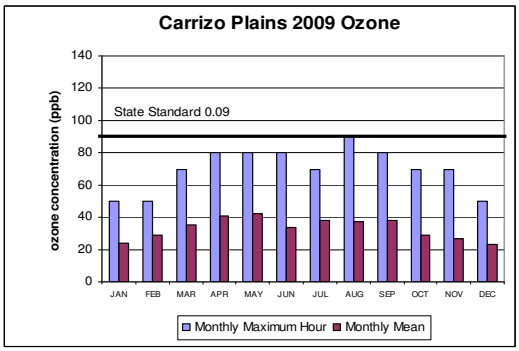
2009 Ozone

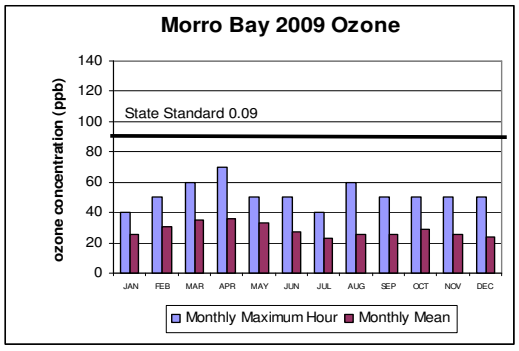
The following graphs depict 2009 monthly ozone concentrations at seven monitoring stations in the county. There are two data bars presented for each month. The monthly maximum hour bar shows the highest hourly average concentration during the month in parts per billion (ppb). The monthly mean bar is a monthly average concentration and depicts average ozone intensity (in ppb) for the month.

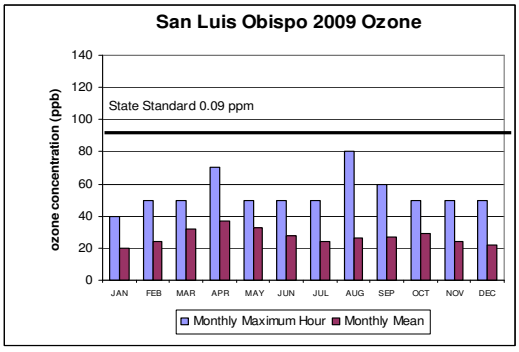


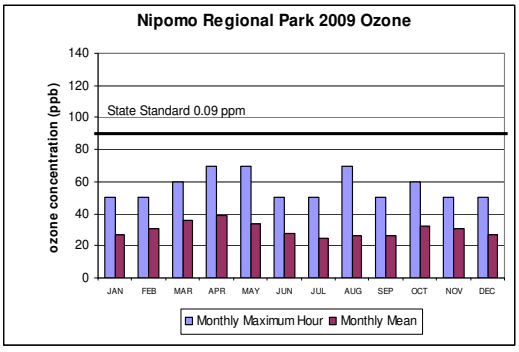






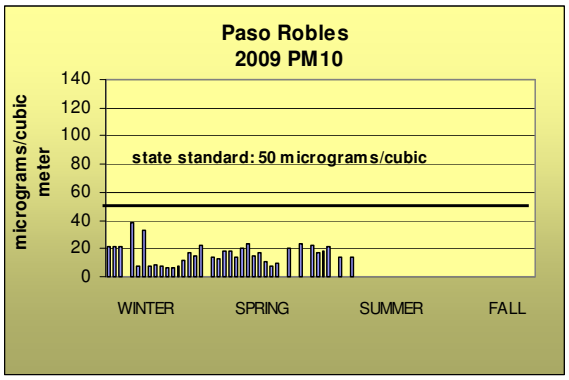


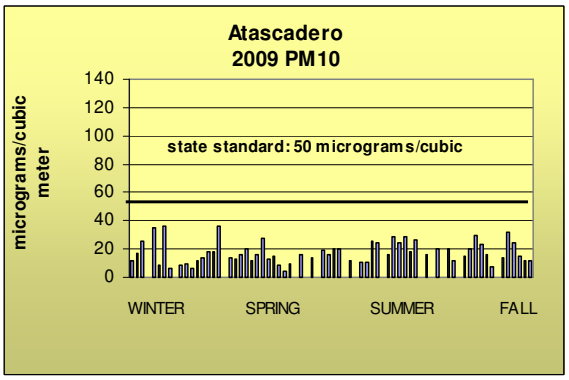


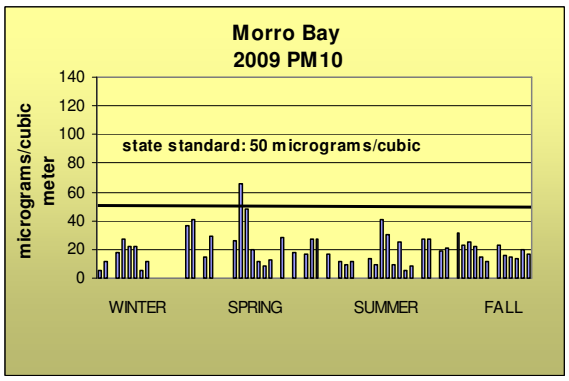


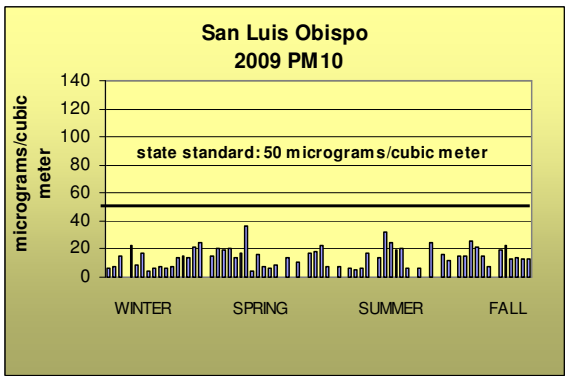
2009 Particulate Matter, 10 Microns or Less (PM_{10})

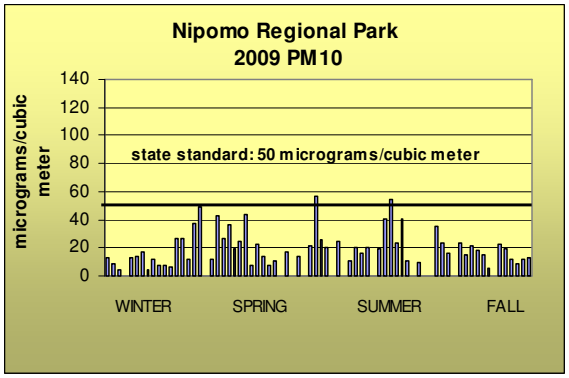
The graphs on this page present 2009 PM_{10} particulate hi-vol data from seven station locations. Missing data bars represent monitor outages or periods where data did not meet quality assurance standards. The Paso Robles PM10 hi-vol monitoring system was replaced with a BAM sampler in August. Hillview was shut down after March 2009. Atascadero continues with both hi-vol and BAM samplers. Mesa2 hi-vol monitoring system was replaced with BAM samplers in July and October but the hi-vol samplers were run in parallel for comparison until the end of 2009. BAM data is reflected in the 2009 PM table listing the highest concentrations and the annual means and the PM_{10} Trend graph.

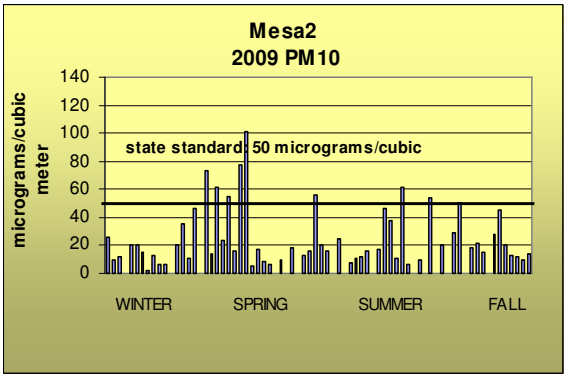


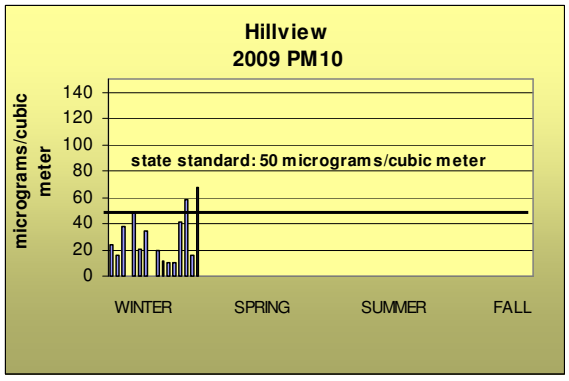






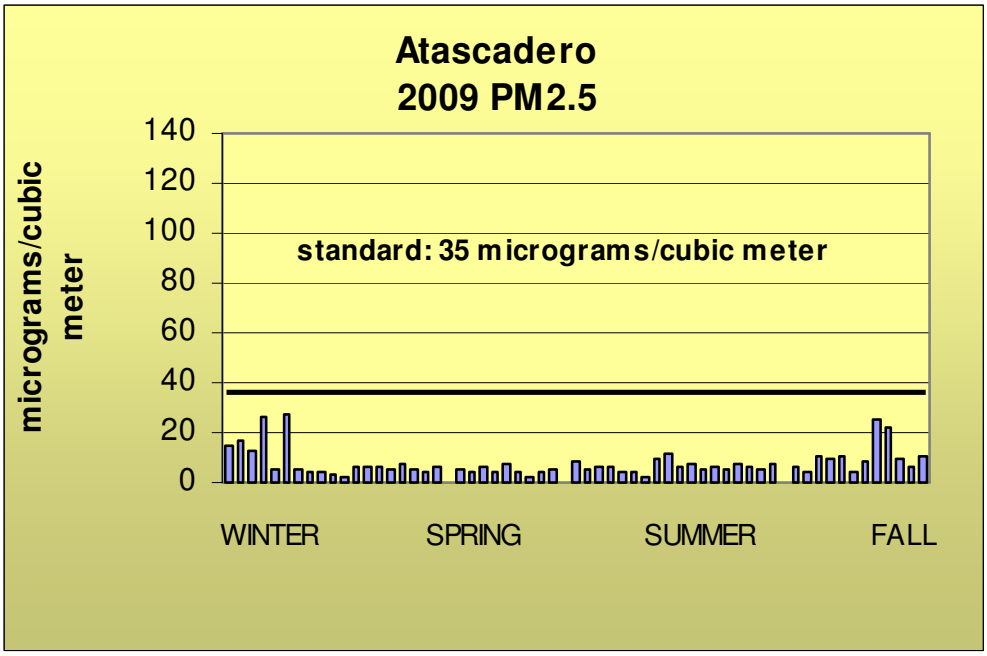






2009 Particulate Matter, 2.5 Microns or Less ($PM_{2.5}$)

Monitoring for fine particulate matter ($PM_{2.5}$) using hi-vol samplers began in 1999 and is performed at two locations in San Luis Obispo and Atascadero. The federal standard for $PM_{2.5}$ of 35 micrograms per cubic meter was not exceeded during 2009. California has not set a 24 hour $PM_{2.5}$ standard. Missing data bars represent monitor outages or where data did not meet quality assurance standards.



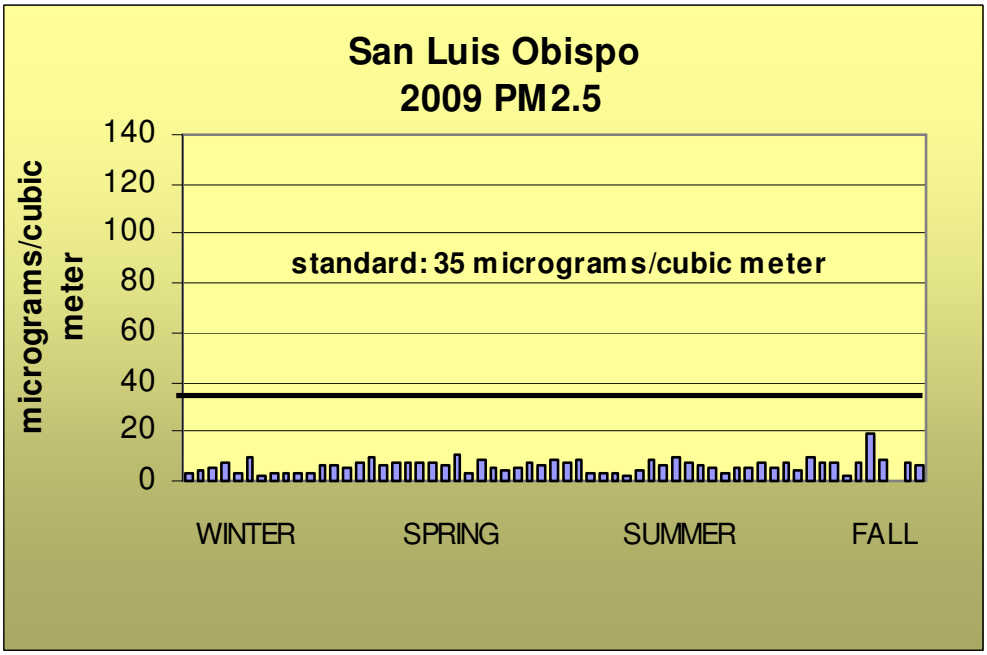


Table 5: First, Second and Third Highest Hourly Averages for 2009

The following table lists the highest hourly (and 8-hour for ozone) concentrations (expressed in parts per million) recorded in 2009 for ozone, sulfur dioxide and nitrogen dioxide at the stations where they are monitored. Sampling date and hour appears with each data value in the format of month/day: hour.

Station	O_3 1-hour			O_3 8-hour			SO_2			NO_2		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Paso Robles	**.074** 05/17:19	**.074** 09/22:12	**.073** 09/23:12	**.065** 09/23:10	**.064** 08/28:10	**.061** 09/10:11						
Atascadero	**.078** 05/17:18	**.077** 09/22:12	**.075** 09/23:15	**.068** 09/23:10	**.066** 08/28:10	**.065** 05/17:12				**.045** 11/03:18	**.044** 11/02:17	**.044** 11/02:18
Morro Bay	**.073** 04/05:17	**.065** 04/21:14	**.062** 04/20:14	**.065** 04/05:11	**.058** 04/20:10	**.058** 04/21:08				**.046** 04/20:06	**.042** 02/02:18	**.037** 01/17:18
San Luis Obispo	**.077** 08/28:17	**.073** 08/29:14	**.069** 04/05:17	**.068** 08/28:10	**.064** 04/05:12	**.063** 08/29:09						
Red Hills	**.084** 06/27:14	**.084** 08/18:13	**.083** 07/18:15	**.079** 09/23:08	**.078** 06/27:11	**.078** 07/18:11						
Carrizo Plains	**.088** 08/18:14	**.083** 09/11:13	**.081** 08/19:13	**.079** 08/18:10	**.077** 09/11:09	**.076** 06/27:11						
Nipomo Regional Park	**.071** 04/21:14	**.070** 04/19:15	**.070** 04/20:14	**.067** 04/21:10	**.066** 04/05:12	**.064** 04/20:09				**.035** 01/16:18	**.035** 01/20:19	**.035** 11/19:18
Nipomo, Mesa 2							**.017** 04/15:08	**.006** 04/13:12	**.006** 04/15:18			

Table 6: Summary of Particulate Matter Concentrations for 2009

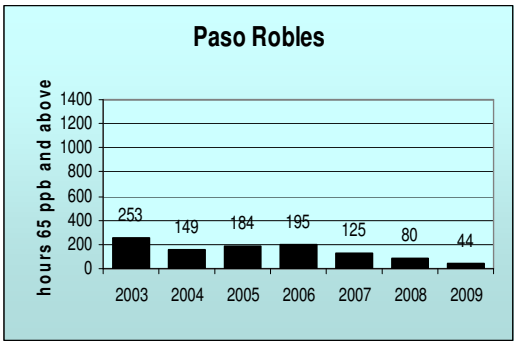
The following table lists the highest concentrations and the annual means recorded in 2009 for PM_{10} and $PM_{2.5}$ particulate matter at the stations where they are monitored. Values are in micrograms/cubic meter. Values exceeding state or federal standards are in bold.

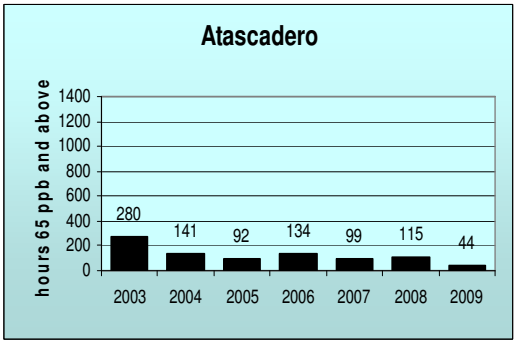
2009	PM_{10}		$PM_{2.5}$	
	Highest Concentration	Annual Arithmetic Mean	Highest Concentration	Annual Arithmetic Mean
Paso Robles	**38 ug/M^3** 01/19	**16.2ug/M^3**		
Atascadero	36 ug/M^3 01/31	**17.5ug/M^3**	26.9 ug/M^3 01/31	7.9 ug/M^3
Morro Bay	**66ug/M^3** 05/13	**20.9ug/M^3**		
San Luis Obispo	37 ug/M^3 05/13	14.6ug/M^3	19.7 ug/M^3 12/03	6.2 ug/M^3
Nipomo Regional Park	**57 ug/M^3** 07/06	**20.2ug/M^3**		
Nipomo, Mesa2	**101 ug/M^3** 05/13	**24.9ug/M^3**	26.0 ug/M^3 09/07	8.1ug/M^3

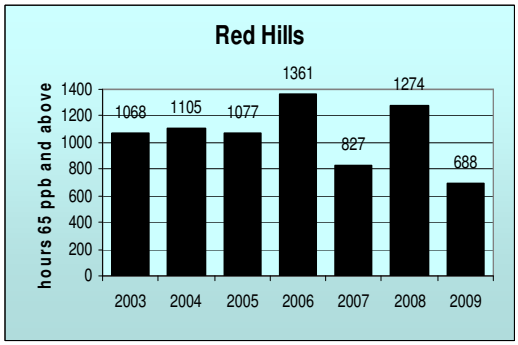
Trends

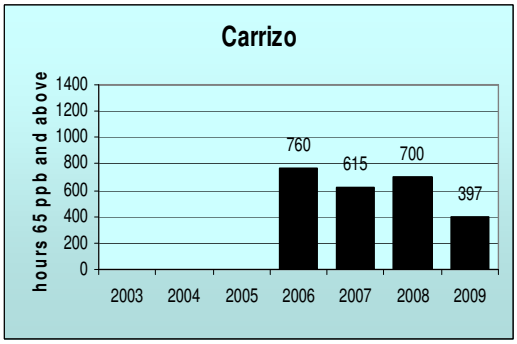
Countywide Ozone Trends - 2003-2009

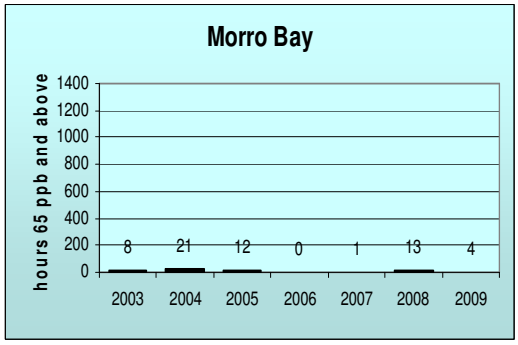
The following graphs depict ozone trends at seven locations within the county for the past seven years except Carrizo, where monitoring began just four years ago. Each data bar represents the total number of hours in a given year in which the ozone concentrations at or above 65 parts per billion. This concentration level is a useful indicator for trend purposes even though there are no health standards for single-hour exposures to 65 parts per billion of ozone.

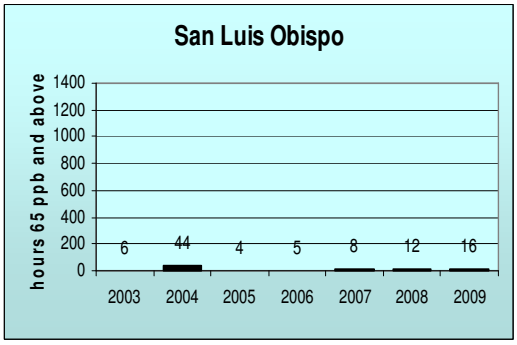


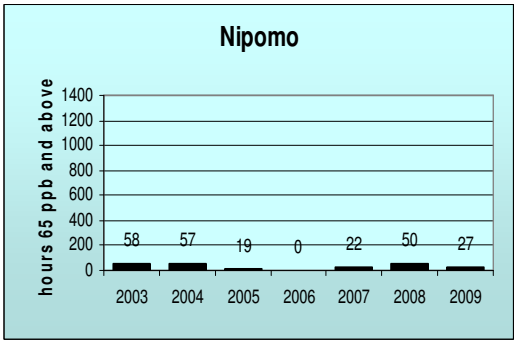






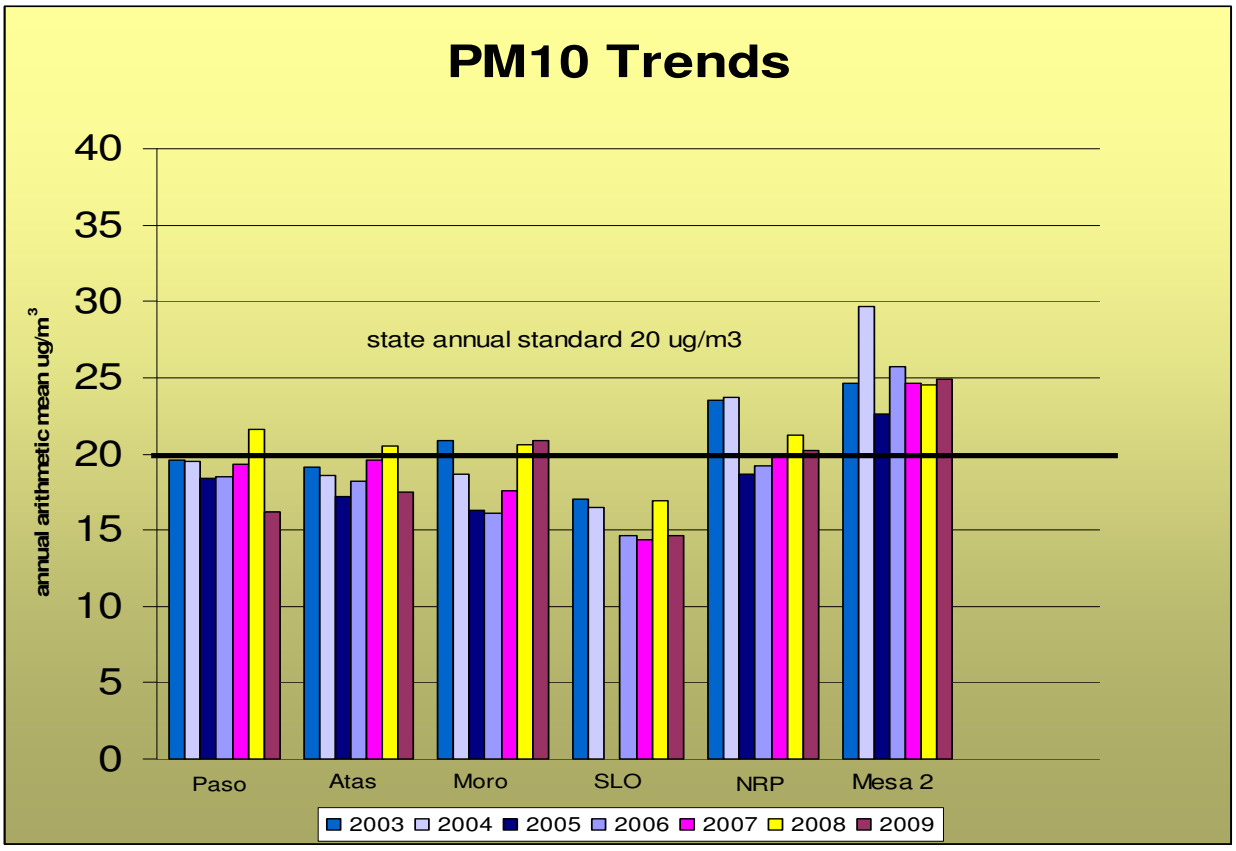






Particulate Matter, 10 Microns or Less (PM_{10}) Trends

The graph below depicts the annual arithmetic average PM10 concentration at six locations in San Luis Obispo County over the past seven years. The SLO station moved in 2005 and data is not shown for that year. While occasional exceedances of the state PM10 standard occur at all sites, the monitors on the Nipomo Mesa at Nipomo Regional Park and Mesa 2 are consistently higher than elsewhere in the county. The reasons for this was investigated through the South County Particulate Matter Phase 2 Study discussed at the beginning of this report. A change to the federal PM10 standard was made in 2002 from a geometric annual mean (30ug) to an annual arithmetic mean (20ug).



Changes to Data Presentation for 2000 - 2007 Annual Reports

Review of the 2000 -2007 Annual Reports during the South County Phase 2 Particulate Study revealed several problems with how data was presented in those reports. Although all monitoring data was correctly obtained and correctly reported to the California Air Resources Board and the Federal Environmental Protection Agency for those years, the APCD Annual Reports for years 2000 to 2007 showed several errors in data presentation tables and graphics. The APCD maintains a "local" copy of all data submitted for quality assurance/quality control procedures. The Federal Air Quality System (AQS) database or "standard" is the official data. As a result of our internal review, several changes were made to data transcription and screening tools and revisions were made to data presentation procedures to ensure these errors do not recur in future years. Data presentation issues discovered in our review are summarized below:

Ozone data 2000-2007:

- Morro Bay data value for 1999 was missing in the 2000 Annual Report.
- Red Hills data noted in the 2001 Annual Report had very small value differences due to differences between APCD and Federal collection, recording and database protocols.
- The ozone trend charts shifted 2 years forward in the 2004 Annual Report and thereafter due to missing data bars from pre-2000 years.

PM data 2000-2007:

- APCD and Federal database review noted some rounding differences due to differences between APCD and Federal collection, recording and database protocols.
- Prior to 2003, data presentation files were manually constructed, increasing the possibility of errors.
- For non-District monitoring stations, some differences were noted between APCD and Federal databases:
    - Prior to 2006 at UCD1, a contractor input the data to the federal database,.
    - Prior to 2002, ARB input data to the Federal database, with probable errors. After 2002, APCD staff input data into the Federal database.
    - SLO station moved in 2005. Data was averaged for that year between the 2 stations.
- 2003 data noted 1 transcription error, 1 flagging error, and 1 make-up run error.

After discovering these errors, changes were made to data transcription and screening tools and revised data presentation procedures, as summarized below:

- Data was re-loaded to the APCD local database from the Federal database to resolve any database differences. In the future, APCD will use only the Federal database for compiling the annual report.
- APCD will use our ozone screening tool to eliminate transcription errors, with a new annual count section.
- APCD will use Federal tools for PM data counts and PM charts as well as the ozone trend chart.
- Very small data differences between Federal and APCD ozone databases are acceptable as they result from minor data collection, data recording and database artifacts.
- Charts and tables will have clearer labels. Example: Trend charts for ozone will state "65 ppb and above" clearly in the axis title.
- Annual Report PM 10 trend graphs will note the change from geometric to arithmetic mean in 2002.
- Cross-check procedures will include review of each staff's work by another staff.
- Other data presentation issues that included missing data in Annual Reports or counting errors would be resolved by the above methods.
- Procedures will document how to use APCD and Federal database reports and tools to generate tables and graphs.

2008 and 2009 Ambient Air Monitoring Network Plans

The San Luis Obispo County Air Pollution Control District (SLOAPCD) Ambient Air Monitoring Network Plan is an annual examination and evaluation of the SLOAPCD's network of air pollution monitoring stations. The annual review of our State and Local Air Monitoring Stations (SLAMS) network is required by Title 40, Code of Federal Regulations, Part 58. The review process helps ensure continued consistency with the network's specific monitoring objectives defined in the regulations and confirms that the information in the state and federal monitoring records accurately and properly classify each station.

These reports are a directory of existing and proposed monitoring in the SLOAPCD's network of SLAMS and research stations and serves as a progress report on the recommendations and issues raised in earlier network reviews. The report also addresses ongoing network design issues.

The review period of these reports looks back to June 2007 (the publication of the 2007 Ambient Air Monitoring Network Plan) and looks forward eighteen months to December 2010 anticipating any changes to the network. New changes to the Code of Federal Regulations require specific detailed monitoring network information be included in these reports along with a 30-day public review period prior to submittal of the report to the USEPA. Any changes to the monitoring network implemented as a result of a review are reported in the annual air quality report. Below is a summary of the current network, proposed and accomplished tasks from the 2008 and 2009 Ambient Air Monitoring Network Plans.

OZONE MONITORING NETWORK

All ambient air monitoring stations in the county, except for MESA2, monitor for ozone (see Table 2). The SLAMS network in San Luis Obispo County features ozone monitors located in Atascadero, Red Hills, Carrizo Plains, Paso Robles, Morro Bay, San Luis Obispo, and Nipomo. Ozone monitoring was performed at Black Mountain until the end of 2006 when the site was closed. No changes were made to this network.

NITROGEN DIOXIDE NETWORK

The SLAMS network in San Luis Obispo County features nitrogen dioxide (NO2) monitors at Atascadero, Morro Bay, and Nipomo Regional Park. NO2 levels have always been well below the state and federal standards at all locations in our county. For this reason, except in the case of
Morro Bay, NO2 monitoring is most useful here as an indicator of depletion of ambient ozone through titration with nitric oxide. Having at least one NO2 monitor in each geographical region of the county also serves a long-term air quality surveillance role. No changes were made to this network.

SULFUR DIOXIDE MONITORING NETWORK

The sulfur dioxide (SO_2) monitoring network in San Luis Obispo County currently consists of one station: MESA2. More extensive SO_2 monitoring has been performed in the past and included monitors at Nipomo, Morro Bay, Grover Beach and (in now-decommissioned stations at MESA and Ralcoa Way) on the Nipomo Mesa. No changes were made to this network.

MESA2 – Operated by private contractors since 1989 this is a special purpose monitor (SPM) for surveillance of a nearby oil refinery and coke calciner. It is considered middle scale and highest concentration for SO_2. Since it is located close to a major source for SO_2 emissions it is representative only of the immediate locality. The station was sited to optimize surveillance of the nearby coke calciner which is shut down. The highest historical SO_2 levels were measured at the two decommissioned stations: MESA and Ralcoa Way.

PARTICULATE MONITORING NETWORK

The particulate monitoring network in San Luis Obispo County consists of PM10 monitors (at Paso Robles, Atascadero, Morro Bay, San Luis Obispo, Mesa 2, Hillview, and Nipomo Regional Park) and PM2.5 monitors (at Atascadero and San Luis Obispo). The PM10 network has been in place since 1988. Originally, all particulate monitoring in the county was performed as part of ARB's network. In the past ten years, however, the District's PM10 sampling program has become independent with our own processing facilities and operating procedures. Today, the Paso Robles and San Luis Obispo PM10 samplers remain part of ARB's network while all other samplers in the county are in the District's network. The PM2.5 FRM monitors at Atascadero are currently part of the ARB network but are operated by the SLOAPCD. The PM2.5 samplers began operation in 1999 in response to the establishment of a new federal particulate standard for PM2.5 in 1997.

The particulate monitoring network on the Nipomo Mesa has been expanded and updated to continuous sampler methods in recent years to address the public health risk from particulate emissions upwind at the Oceano Dunes State Vehicle Recreational Area. The network continues to be modified to meet the needs of air quality surveillance as we move forward with mitigating impacts from the state park. APCD particulate monitoring at Paso Robles and Atascadero also benefits from having continuous sampler data.

Proposed and implemented changes to the PM Network included:

1. Atascadero:
   A. The mass-flow controlled hi-vol PM10 sampler was replaced with a volumetric hi-vol sampler at the end of 2008. All 2009 hi-vol data from this site were collected with the new sampler.
   B. A BAM 1020a particulate sampler was installed at Atascadero for monitoring of PM2.5 in April and was producing valid data beginning in May 2009 and reporting started in June.

2. Mesa 2:
   Two BAM 1020a particulate samplers were installed at the Mesa 2 monitoring station in 2009. One is for continuous PM10 and one for continuous PM2.5 monitoring. The hi-vol PM10 sampler at the site was removed at the end of 2009 after a period of collocation and comparison with the BAM samplers.

3. Hillview:
   The hi-vol PM10 SPM sampler at Hillview was shut down after March of 2009 after less than two years operation. PM10 sampling occurs at nearby monitoring stations eliminating the need for this sampler.

4. Morro Bay:
   The mass-flow controlled hi-vol PM10 sampler was replaced with a volumetric hi-vol sampler in 2009.

5. Nipomo Regional Park:
   A BAM 1020a PM10 sampler is scheduled to be installed at NRP in the second half of 2009. The hi-vol PM10 sampler at the site will be removed after a period of collocation and comparison with the BAM. This was postponed to 2010.

6. CDF:
   This special South County Phase 2 Particulate Study monitor operated 2008-2009. It is proposed to make this monitoring station permanent in 2010.

SITE AND STRUCTURAL NOTES

Grover Beach:

The trailer which houses the Grover Beach monitors is in need of replacement. The trailer will be removed and replaced with a small weatherproof structure to house the electronic equipment. No significant data loss is anticipated from this action. No changes to the EPA/AQS database was necessary as a result of this change.

Mesa 2:

The shelter at Mesa 2 was replaced with an office trailer in the summer of 2009. No changes to the EPA/AQS database was necessary as a result of this change.

EPA AND ARB AUDITS

The APCD has passed technical and data audits each year. Copies of the results of these audits are available upon request to ARB and EPA.

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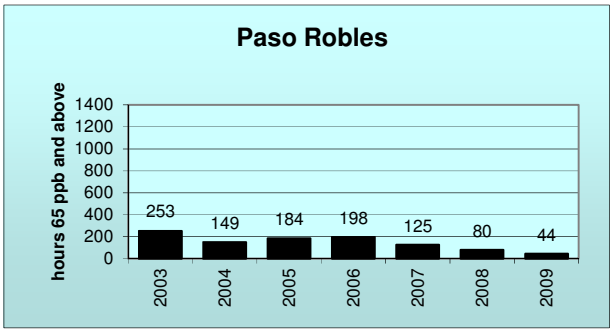
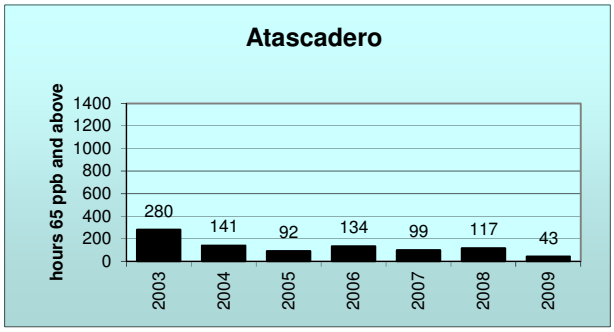
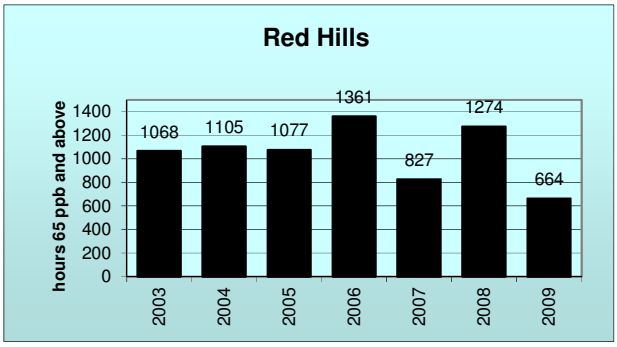
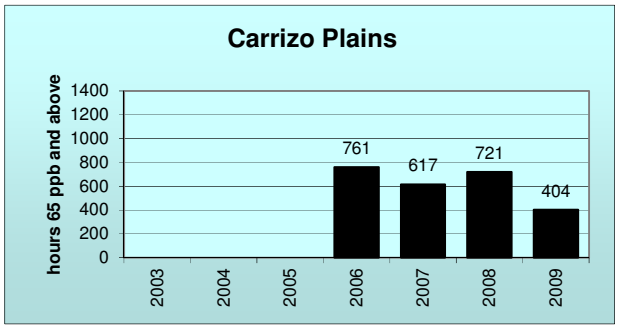
Errata

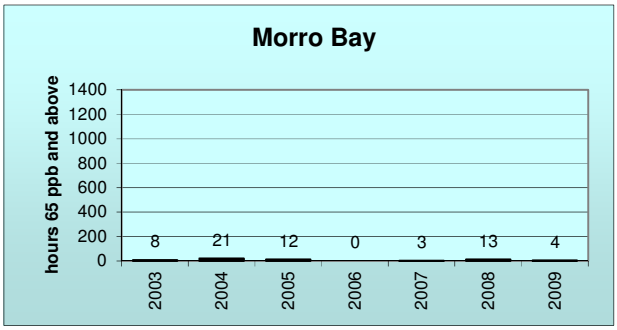
Since 2010, the District has been upgrading and standardizing our data compilation and analysis methods, including improvements to data accuracy by switching to electronic data tabulation rather than the manual count method used previously. A comprehensive review of the data presented in this and prior annual reports was conducted to identify and correct any data discrepancies compared to current methods. This review revealed some minor tabulation errors in the Ozone Trends charts presented on page 18 of this report. Corrected figures appear below.

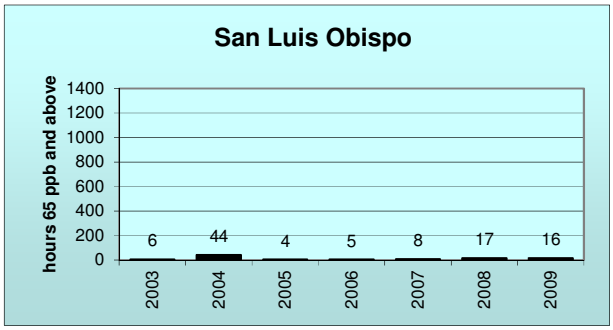


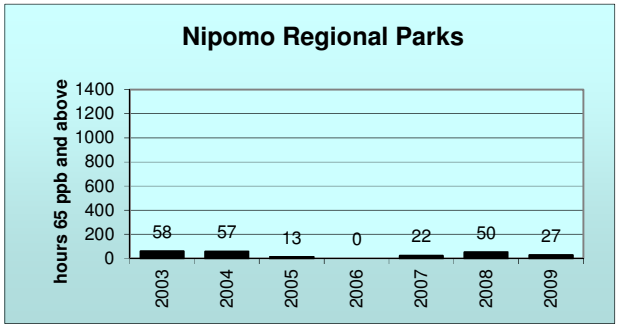




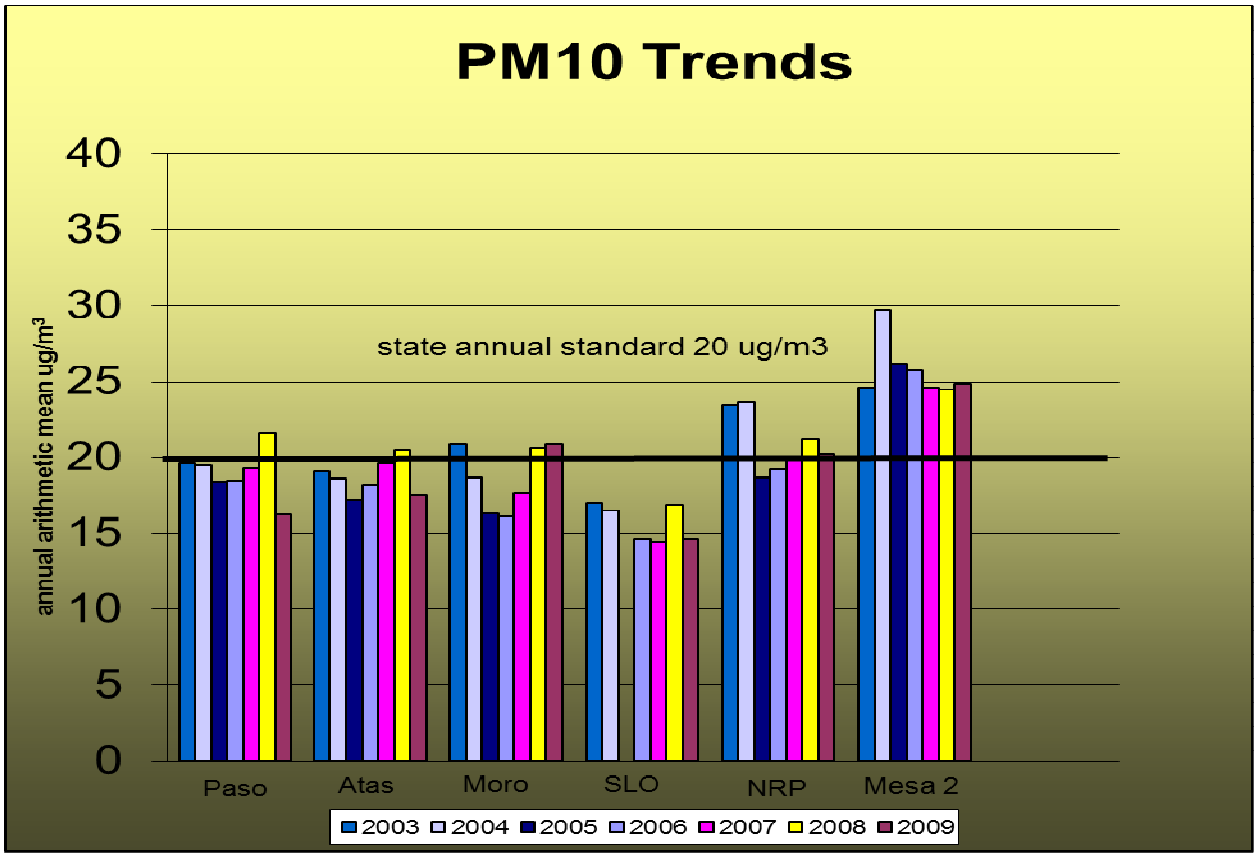








Additionally, the value for the Mesa2 2005 annual average was found to be in error in the PM10 Trends chart on page 19. A corrected representation of the figure appears below.



As a final note, two minor changes were made to the original discussion of data presentation errors described on page 20:

1. The previous page title "*Changes to Data Presentation for 2006-2007 Annual Reports*" was corrected to "*Changes to Data Presentation for 2000-2007 Annual Reports*" to reflect the actual corrections performed.
2. An incorrect reference to the Carrizo Plains monitoring site was deleted in the second bullet point under the paragraph titled "*Ozone data 2000-2007*".