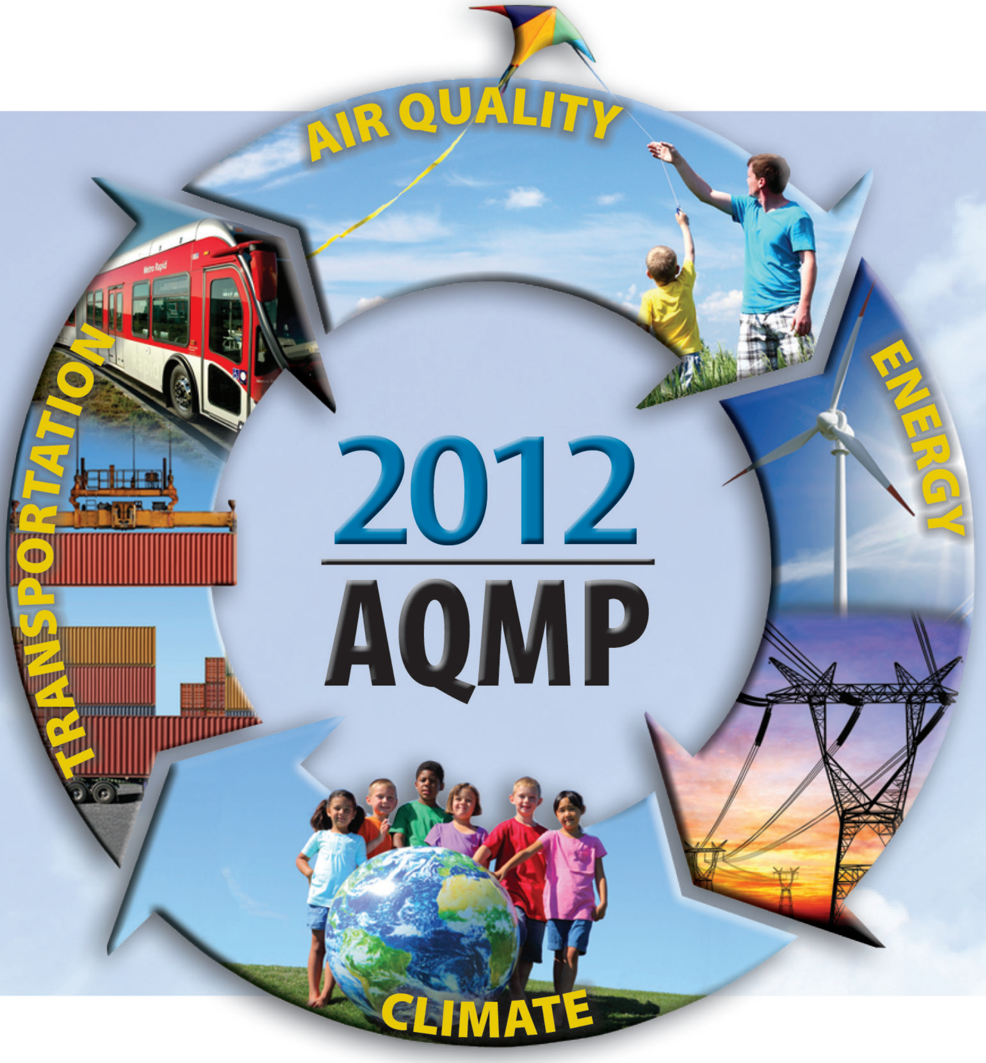
Appendix II

Air Quality Management Plan



Current Air Quality

February 2013

South Coast Air Quality Management District
Cleaning the air that we breathe...™
South Coast AQMD

FINAL 2012 AQMP
APPENDIX II

CURRENT AIR QUALITY

FEBRUARY 2013

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SUMMARY

SUMMARY

This appendix contains a detailed summary of the air quality in 2011 and the prior year trends for the South Coast Air Basin (Basin) and the Coachella Valley portion of Salton Sea Air Basin (SSAB), under the jurisdiction of the South Coast Air Quality Management District (District). The Basin includes Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino counties. In 2011, the District measured concentrations of air pollutants at 35 routine air monitoring stations in Southern California's Los Angeles, Orange, Riverside and San Bernardino counties, including two stations in the Coachella Valley. In addition, six source-specific lead (Pb) monitors were operated in 2011, near potential Pb emission sources.

Chapter 1 of this appendix presents descriptions of the air quality setting for the District's jurisdiction, including the relevant boundaries, weather factors and emissions for both the Basin and the Coachella Valley. It also briefly describes the properties and health effects of each criteria pollutant and the state and federal ambient air quality standards, along with revisions to the standards, both adopted and currently proposed. Criteria pollutants are those which have associated health-based National Ambient Air Quality Standards (NAAQS). Chapters 2 and 3 present summaries of current air quality for each of the criteria pollutants in the Basin and the Coachella Valley, respectively. These chapters include comparisons of the current concentrations compared to the state and federal standards, along with spatial, seasonal, and diurnal variations. Air quality statistics and trends presented in this Appendix provide information on the recent history and current status and progress toward attainment of the NAAQS and state standards, providing a baseline for planning toward future attainment.

Ozone (O_3) and fine particulate matter (PM2.5) are the main pollutants for which the U.S EPA has designated the Basin as nonattainment. The Coachella Valley is also a nonattainment area for ozone and PM10, but PM2.5 concentrations remain below the federal standards. PM2.5 concentrations in the Basin have improved considerably, with 2010 and 2011 the cleanest years on record for the area. However, the Basin had the highest number of days exceeding the federal ozone standard of any urban area nationwide in 2011.

The Los Angeles County portion of the Basin is also currently nonattainment for the recently lowered federal lead standard, due to source-specific monitoring near a stationary Pb source, as required under the new U.S. EPA regulation. The remaining ambient Pb monitoring measurements throughout the Basin are below the current Pb

NAAQS. Pb air quality and attainment has been addressed separately in the 2012 Lead SIP for Los Angeles County submitted to U.S. EPA in June 2012.

While the new federal 1-hour standard concentration level was exceeded on one day for nitrogen dioxide (NO_2) in 2011, it should be noted that this does not include nonattainment. The Basin has not been designated as nonattainment of the NAAQS, since the Basin has not exceeded the design value[1] form of the revised NO_2 standard (98th percentile concentration, averaged over 3 years).

Both the Basin and the Coachella Valley are currently listed as PM10 nonattainment areas by U.S. EPA, based on the current 24-hour PM10 NAAQS. However, all exceedances of the federal 24-hour PM10 NAAQS in recent years have been flagged in the U.S. EPA Air Quality System (AQS) database for exclusion based on the U.S. EPA Exceptional Events Regulation (due to high wind events and Independence Day fireworks displays). The District has requested that U.S. EPA consider redesignating both areas to attainment status. State and federal standards for carbon monoxide (CO), sulfur dioxide (SO_2), and sulfate (SO_4^{2-}) were not exceeded in the District.

[1] A design value is a statistic that describes the air quality status of a given area relative to the level and form of the National Ambient Air Quality Standards (NAAQS). For most criteria pollutants, the design value is a 3-year average and takes into account the form of the short-term standard (e.g., 98th percentile, fourth high value, etc.)

CHAPTER 1
INTRODUCTION

AIR QUALITY SETTING

District Jurisdiction and Boundaries

California's first local air pollution control agency, the Los Angeles County Air Pollution Control District (LAAPCD), was formed in 1947, and APCDs were formed in Orange, Riverside, and San Bernardino Counties soon afterward. These four agencies combined in 1976 to form the Southern California APCD, which was later replaced by the South Coast Air Quality Management District, the Mojave Desert AQMD, (which covers the Mojave Desert Air Basin except for the portion within the South Coast Air District in the eastern portion of Riverside County), and the Antelope Valley APCD (which covers portions of Los Angeles County not within the South Coast Air Basin).

The South Coast Air Quality Management District (District) was established by state legislation effective February 1, 1977, and was assigned jurisdiction over air quality in the South Coast Air Basin (Basin). The Basin includes all of Orange County and the non-desert areas of Los Angeles, Riverside, and San Bernardino Counties. The District is also responsible for air quality in the Riverside County portion of the Salton Sea Air Basin (SSAB), which is primarily the Coachella Valley. The region encompassed by the District is shown in Figure 1-1.

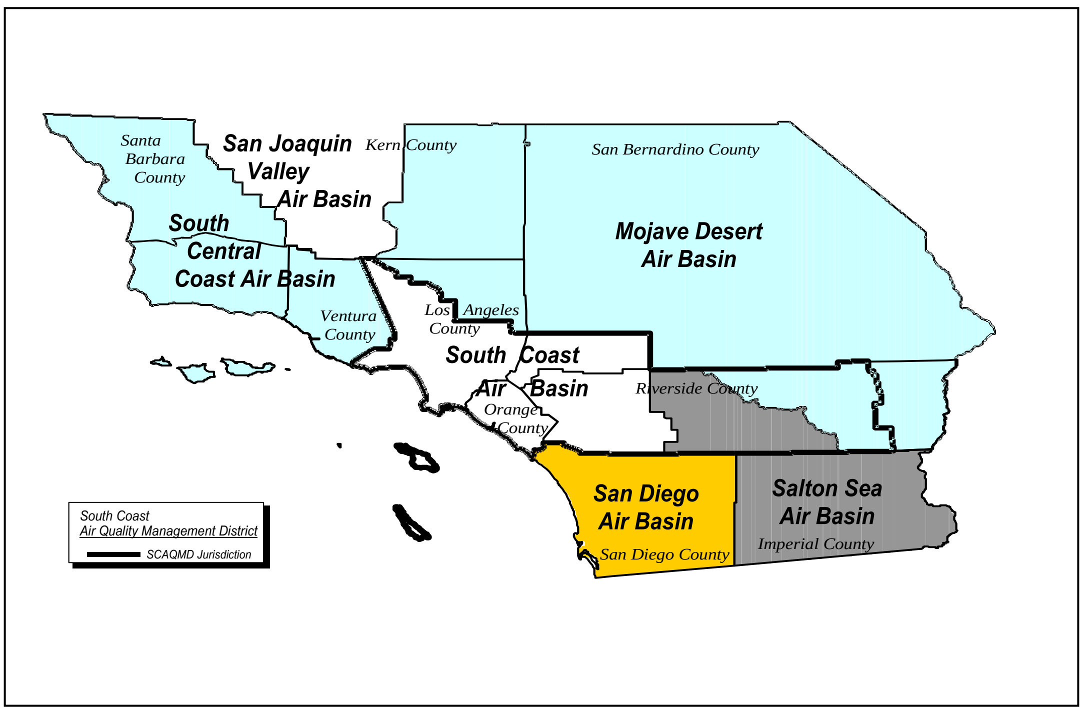


FIGURE 1-1
South Coast Air Quality Management District and Surrounding Jurisdictions

The Basin has an area of 6,800 square miles with a population of approximately 16 million people in 2011. The Los Angeles urban area (the nation's second largest), the Anaheim-Fullerton urban area, and the Riverside-San Bernardino urban area lie within the Basin's boundaries. About two-thirds of the Basin's population lives within Los Angeles County. The 2011 population in the Riverside county portion of the SSAB portion under the jurisdiction of the District was approximately 450,000. The District also has the jurisdiction over a small portion of the MDAB in Eastern Riverside County (see Figure 1-1). The area is sparsely populated desert and contains a portion of Joshua Tree National Park. Table 1-1 summarizes the historic, current and future projections of the population of the Basin and the Coachella Valley.

TABLE 1-1
Historic Population and Projections for South Coast Air Basin and Coachella Valley

Area	1980	1990	2000	2010	2020	2030
South Coast Air Basin	10,500,000	13,022,000	14,681,000	15,759,412	16,901,492	18,129,690
Coachella Valley	139,000	267,000	320,892	439,357	558,321	710,430

The SSAB and the Mojave Desert Air Basin (MDAB) have a combined area of approximately 32,200 square miles. The two Basins include the desert portions of Los Angeles, Riverside, and San Bernardino Counties, as well as Imperial County and part of Kern County.

In 2011, the District maintained a network of 33 regular air monitoring stations[2] in the Basin and two in the Coachella Valley area. In addition, six monitors measure source-specific lead near emissions sources. Figure 1-2 shows the locations of the ambient air monitoring stations along with the District boundaries. PM2.5 monitoring has been significantly increased throughout the District in recent years, using both Federal Reference Method (FRM) filter measurements and continuous measurements for real-time data. Table A-1 and Figure A-1 in the Attachment to Appendix II also show the District's current ambient air monitoring network.

[2] Not all criteria pollutants are measured at every station.

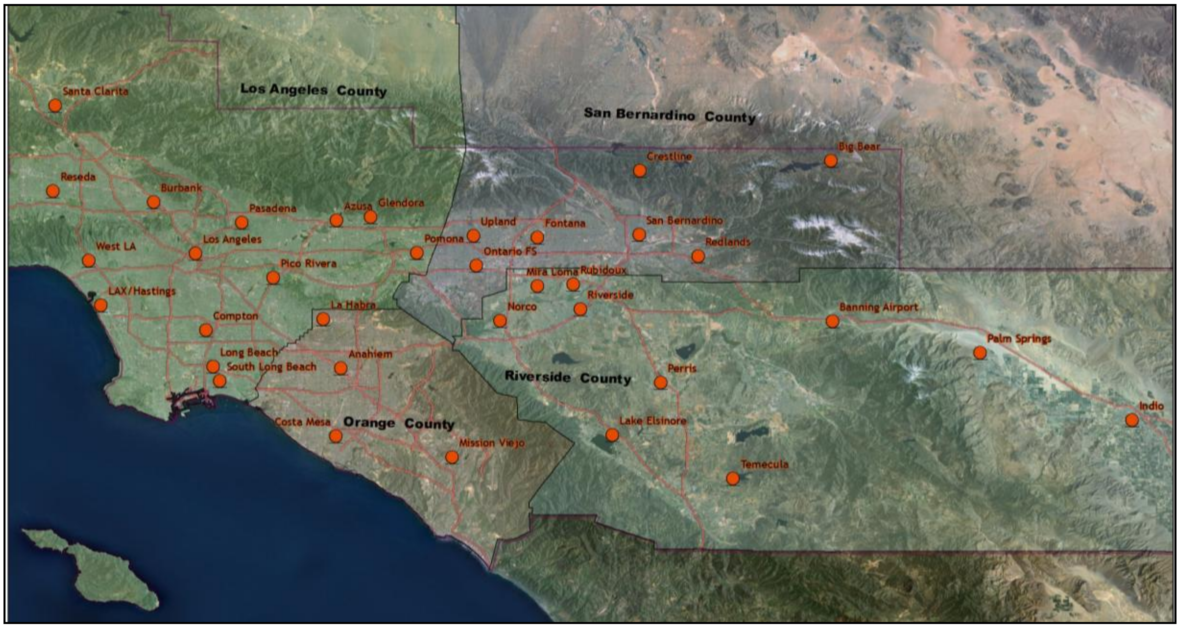


FIGURE 1-2

South Coast Air Quality Management District Ambient Air Monitoring Stations in 2011

Weather Factors

The climate of the District varies considerably between the coastal zone, inland valleys, mountain areas and deserts. Most of the Basin is relatively arid, with very little rainfall and abundant sunshine during the summer months. It has light winds and poor vertical mixing compared to other large urban areas in the U.S. The combination of poor air dispersion and abundant sunshine provides conditions especially favorable to the formation of photochemical smog and the trapping of particulates and other pollutants. The Basin is bounded to the north and east by mountains with maximum elevations exceeding 10,000 feet. The unfavorable combination of meteorology, topography, and emissions from the nation's second largest urban area results in the Basin having some of the worst air quality in the U.S.

The prevailing daytime sea breeze tends to transport pollutants and precursor emissions from coastal areas into the Basin's inland valleys, and from there, still further inland into neighboring areas of the SSAB, as well as the MDAB. Concentrations of primary pollutants (those emitted directly into the air) are typically highest close to the sources which emit them. However, secondary pollutants (those formed in the air by chemical reactions, such as ozone and the majority of PM2.5) reach maximum concentrations some distance downwind of the sources that emit the precursors, due to the fact that the polluted air mass is moved inland by the prevailing winds many miles to areas where maximum concentrations are reached.

Emissions

The quantity of each of the major pollutants emitted into the atmosphere of the Basin in 2008 is shown in Figure 1-3 (in thousands of Tons per Day). The year 2008 emissions are the base year emissions used for the Final 2012 AQMP. In that year, the Basin's annual average daily emissions were approximately 2880 tons of CO, 593 tons of volatile organic compounds (VOC), 754 tons of oxides of nitrogen (NO_x), 54 tons of oxides of sulfur oxides (SO_x), 170 tons of PM10, and 80 tons of PM2.5. Figure 1-4 shows the amount of each of the major pollutants emitted into the atmosphere in the Coachella Valley (in Tons per Day). These are much lower than those emitted in the Basin, by a factor of 10 to over 350, depending on the pollutant. The difference in local emissions between these two areas and the prevailing wind flows illustrate the importance of pollutant transport to the Coachella Valley's air quality.

Additional PM10 and PM2.5 material forms through chemical reactions of gaseous precursor emissions. Most emissions vary relatively little by season, but there are large seasonal differences in the atmospheric concentrations of pollutants due to seasonal variations in the weather. VOCs and NO_x are precursors of ozone, and they also react to form nitrates and solid organic compounds, which are a significant fraction of the ambient particulate matter. SO_2 reacts to form sulfates which are also significant contributors to the Basin's PM10 and PM2.5 levels. In addition to the particulates formed by the reaction of gaseous precursors, there is directly emitted PM10 and PM2.5, most of which is attributed to fugitive dust sources such as re-entrained road dust, construction activities, farming operations and wind-blown dust but also includes other directly-emitted substances such as diesel particulate. Details of the 2008 base year and future-year projected emissions inventories are contained in Chapter 3 and Appendix III.

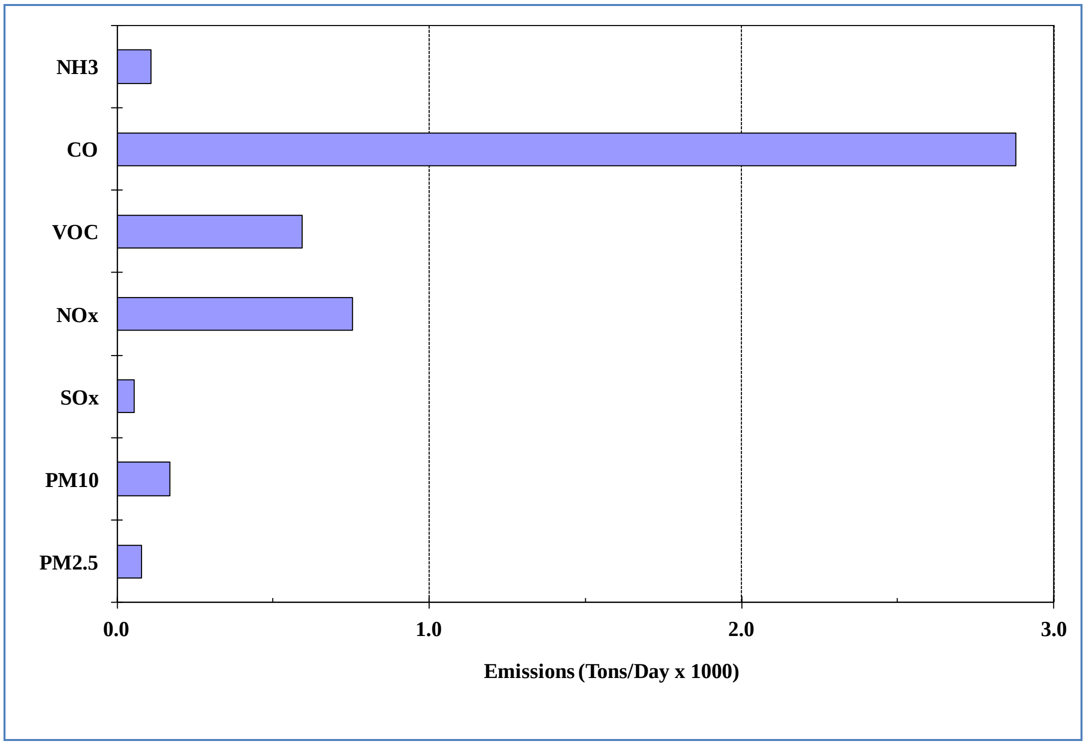


FIGURE 1-3

2008 South Coast Air Basin Average Daily Emissions (Thousand Tons per Day)

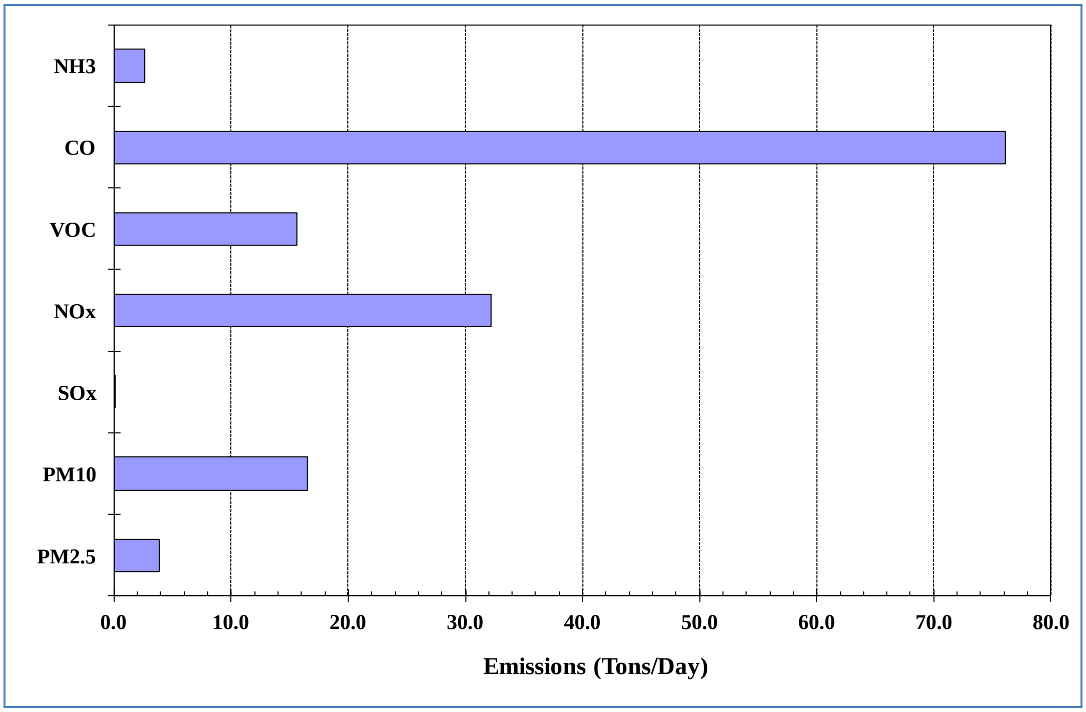


FIGURE 1-4

2008 Coachella Valley Average Daily Emissions (Tons per Day)

AMBIENT AIR QUALITY STANDARDS

Both the federal government and the State of California have adopted ambient air quality standards, which define the concentration below which long-term or short-term exposure to a pollutant is not expected to cause adverse effects to public health and welfare. The criteria pollutants, those that have health-based standards, are: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), coarse and fine particulate matter (PM10 and PM2.5, respectively), lead (Pb), and sulfate (SO_4^{2-}, California only). California also has a welfare-based standard for visibly-reducing particles. In 2011, the District monitored ambient air quality for criteria pollutants at 35 routine monitoring sites throughout the Basin and in the neighboring Coachella Valley in the Riverside county portion of the Salton Sea Air Basin (SSAB), plus six additional source-specific lead monitors.

For several National Ambient Air Quality Standards (NAAQS), there are both primary and secondary standards. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. This document focuses on the primary federal standards. The federal and state primary standards are summarized in Table 1-2, along with a brief summary of health effects. Further discussion of the health effects of air pollutants is presented in Chapter 2 and more detailed health information is presented in Appendix I.

TABLE 1-2

Current Primary Ambient Air Quality Standards and Health Effects

Air Pollutant	State Standard	Federal Standard (NAAQS)	Relevant Health and Welfare Effects[#]
	Concentration, Averaging Time	Concentration, Averaging Time	
Ozone (O_3)	0.09 ppm, 1-Hour 0.070 ppm, 8-Hour	0.075 ppm, 8-Hour (2008) 0.08 ppm 8-Hour (1997)	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage
Carbon Monoxide (CO)	20 ppm, 1-Hour 9.0 ppm, 8-Hour	35 ppm, 1-Hour 9 ppm, 8-Hour	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide (NO_2)	0.18 ppm, 1-Hour 0.030 ppm, Annual	100 ppb, 1-Hour 0.053 ppm, Annual	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide (SO_2)	0.25 ppm, 1-Hour 0.04 ppm, 24-Hour	75 ppb, 1-Hour	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath, and chest tightness during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	50 µg/m^3, 24-Hour 20 µg/m^3, Annual	150 µg/m^3, 24-Hour	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death
Suspended Particulate Matter (PM2.5)	12.0 µg/m^3, Annual	35 µg/m^3, 24-Hour 15.0 µg/m^3, Annual	
Sulfates-PM10 (SO_4^{2-})	25 µg/m^3, 24-Hour	N/A	(a) Decrease in lung function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead (Pb)	1.5 µg/m^3, 30-day	0.15 µg/m^3, 3-month rolling	(a) Learning disabilities; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount such that the extinction coefficient is greater than 0.23 inverse kilometers at relative humidity less than 70 percent, 8-hour average (10am - 6pm)	N/A	Visibility impairment on days when relative humidity is less than 70 percent

ppm – parts per million by volume ppb – parts per billion by volume

State standards are "not-to-exceed" values; Federal standards follow the design value form of the NAAQS

[#] More detailed health effect information can be found in the 2012 AQMP Appendix I or the U.S. EPA NAAQS documentation at http://www.epa.gov/ttn/naaqs/

Design Values

Air quality statistics can be presented in terms of the maximum concentrations measured at monitoring stations or in air basins, as well as for the number of days exceeding state or federal standards. These are instructive in regard to trends and the effectiveness of control programs. However, it should be noted that an exceedance of the concentration *level* of a federal standard does not necessarily lead to a violation of the to a nonattainment designation. The form of the standard as defined by the federal NAAQS regulations must also be considered. For 24-hour PM2.5, the *form* of the standard is the 98th percentile measurement of all the 24-hour PM2.5 samples at each station. For 8-hour O_3, the 4th highest measured 8-hour average concentration is used for each station. For NAAQS attainment/nonattainment decisions, the most recent 3 years of data are considered, along with the form of the standard, and are typically averaged to calculate a *Design Value* for each station. The overall design value for an air basin is the highest design value of all the stations in that basin. U.S. EPA also allows certain data to be flagged and not considered for NAAQS attainment status, when that data is influenced by exceptional events, such as high winds, wildfires, volcanoes, or some cultural events (Independence Day fireworks) that meet strict criteria. Table 1-3 shows the design value requirements utilizing the form of the federal standards for the federal criteria pollutants.

TABLE 1-3

Primary National Ambient Air Quality Standards (NAAQS) and Design Value Requirements

Pollutant	Averaging Time	Standard Level	Design Values and Form of Standards*
Ozone (O_3)	1-Hour** (1979)	0.12 ppm	Not to be exceeded more than once per year averaged over 3 years
	8-Hour (1997)	0.08 ppm	Annual fourth highest 8-hour average concentration, averaged over 3 years
	8-Hour (2008)	0.075 ppm	Annual fourth highest 8-hour average concentration, averaged over 3 years
Carbon Monoxide (CO)	1-Hour	35 ppm	Not to be exceeded more than once a year
	8-Hour	9 ppm	
Nitrogen Dioxide (NO_2)	1-Hour	100 ppb	Three-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations (rounded)
	Annual	0.053 ppm	Annual average concentration, averaged over 3 years
Sulfur Dioxide (SO_2)	1-Hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	24-Hour#	0.14 ppm	Not to be exceeded more than once per year
	Annual#	0.03 ppm	Annual arithmetic average
Particulate Matter (PM10)	24-Hour	150 µg/m^3	Not to be exceeded more than once per year averaged over 3 years
	Annual**	50 µg/m^3	Annual average concentration, averaged over 3 years
Particulate Matter (PM2.5)	24-Hour	35 µg/m^3	Three-year average of the annual 98th percentile of daily 24-hour concentration
	Annual	15.0 µg/m^3	Annual average concentration, averaged over 3 years
Lead (Pb)	3-Month Rolling##	0.15 µg/m^3	Highest rolling 3-month average of the three years

* Standard is attained when the design value (form of concentration listed) is equal to or less than the NAAQS; for pollutants with the design values based on "exceedances" (1-hour O_3, 24-hour PM10, CO, and 24-hour SO_2), the NAAQS is attained when the concentration associated with the design value is less than or equal to the standard:

- For 1-hour O_3 and 24-hour PM10, the standard is attained when the 4th highest daily concentrations of the 3-year period is less than or equal to the standard
- For CO and 24-hour SO_2, the standard is attained when the 2nd highest daily concentration of the most recent year is equal to or less than the standard

** Standard has been revoked. For 1979 1-hour O_3, nonattainment areas have some continuing obligations under the former 1979 standard. For 8-hour O_3, the standard has been lowered from (0.08 ppm to 0.075 ppm), but the 1997 O_3 standard and most related implementation requirements remain in place until further action by U.S. EPA

\# Annual and 24-hour SO_2 NAAQS will be revoked one year from attainment designations for the new (2010) 1-hour SO_2 standard

\## 3-month rolling Pb averages of the first year (of the three year period) include November and December monthly averages of the prior year. The 3-month average is based on the average of "monthly" averages

Summary of Criteria Pollutants and Air Quality Standards

Ambient air quality standards are periodically reviewed by U.S. EPA and state agencies to incorporate the findings from the most current research available on the effects of pollutants. Alert and advisory levels for advising the public about unhealthful air quality are also recommended. The section below summarizes the pollutant properties and health information, along with the air quality standards, including the recently revised or newly established standards and recently proposed revisions of the particulate NAAQS. Further discussion of the health effects of air pollutants is presented in Chapter 2 and more detailed health effects information is presented in Appendix I.

Particulate Matter Properties

Particulate matter (PM) air pollution is a complex mixture of small particles and liquid droplets, made up of a number of components, including acids and salts (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Particles originate from a variety of anthropogenic mobile and stationary sources and from natural sources. These particles can be emitted directly or formed in the atmosphere by transformations of gaseous emissions, such as sulfur oxides (SOx), nitrogen oxides (NOx), ammonia (NH_3) and volatile organic compounds (VOC). Examples of secondary particle formation include: 1) conversion of SOx and NOx to acid droplets or vapor that further react with ammonia to form ammonium sulfate and ammonium nitrate; and 2) reactions involving gaseous VOC, yielding organic compounds that condense on existing particles to form secondary organic aerosol (SOA) particles.

The size of particles is directly linked to their potential for causing health problems. Particles that are 10 micrometers (µm) in diameter or smaller (PM10) are of more concern than larger particles because those are the particles that generally pass through the throat and nose and enter the lungs. (A µm is 1/1000th of a millimeter; there are 25,400 micrometers in an inch.) Once inhaled, these particles can affect the heart and lungs and cause serious health effects. PM air pollution is typically grouped into two overlapping categories:

- *Inhalable coarse particles* (PM10), such as those found near roadways and dusty industries, are smaller than 10 µm in diameter. PM10 includes all PM2.5 particles;

- *Fine particles* (PM2.5), such as those found in smoke and haze, are 2.5 µm in diameter and smaller. These particles can be directly emitted from combustion sources, such as from diesel exhaust (soot) or forest fire smoke, or they can form when gases emitted from power plants, industries and motor vehicles react in the air. PM2.5 is a subset of PM10 particles.

PM10 Properties

Respirable particles (particulate matter less than about 10 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis, and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to PM10.

PM10 particles are both directly emitted and formed chemically in the atmosphere from diverse emission sources. Major sources of PM10 include re-suspended road dust or soil entrained into the atmosphere by wind or activities such as construction and agriculture. These are mainly the coarser particles, in the PM10-PM2.5 coarse fraction range (often referred to as PM-Coarse, i.e., particles in the size range between 2.5 µm and 10 µm). Other components of PM10 form in the atmosphere (secondary PM10) from gaseous precursor emissions. These are mostly the smaller particles, mainly in the PM2.5 size range.

PM2.5 Properties

PM2.5, also known as fine particles, are the finer sized particles less than 2.5 µm in diameter, small enough to penetrate the defenses of the human respiratory system and lodge in the deepest recesses of the lung, causing potential adverse health impacts. The health effects include increased risks of heart attacks and strokes, aggravated asthma, acute bronchitis and chronic respiratory problems such as shortness of breath and painful breathing (in children, the elderly and sensitive people), and premature deaths (mainly in the elderly due to weaker immune systems). Sources of PM2.5 include diesel-powered vehicles such as buses and trucks, fuel combustion from automobiles, power plants, industrial processes, and wood burning.

In the Basin, much of the PM10 fraction is actually PM2.5 and smaller in size than 2.5 µm, a situation which has major implications for both health and atmospheric visibility. Reducing PM2.5 concentrations will therefore not only reduce the threat to the health of the Basin's population, but will also improve visibility in this region.

Total Suspended Particulate (TSP) Properties

Total suspended particulate (TSP) is the name applied to the complex mixture of particles suspended in the atmosphere, with no strict differentiation for particle size. TSP is collected on a glass fiber filter by means of a high volume sampler. Samples are collected for a 24-hour period every sixth day, and then returned to the District laboratory to be weighed for mass and chemically analyzed to determine the concentrations of sulfate, nitrate, and lead. The federal and state standards for lead are based on the analysis of TSP samples. In 2011, TSP samples were collected by the District at 14 sites. In addition, the District measured TSP lead at several source-specific sites in the vicinity of facilities known to emit lead, in order to comply with recent federal requirements to monitor those sources. The lead measurements throughout the Basin are detailed further at the end of this Chapter. Other than the specific health effects of lead, the fine fraction of TSP has greater effects on health and visibility than the coarse fraction. Of greatest concern to public health are the particles small enough to be inhaled into the lungs (PM10) and especially the smaller fine particles that are inhaled more deeply into the lungs (PM2.5). As a result the federal standard for TSP mass has been replaced with the PM10 and PM2.5 standards.

Particulate Matter (PM) Air Quality Standards

PM10 Air Quality Standards

In 1987, U.S. EPA adopted PM10 standards, replacing the earlier TSP standard. The District began PM10 monitoring in late 1984. U.S. EPA promulgated both a short-term 24-hour average standard (150 $\mu g/m^3$)[3] and an annual standard (50 $\mu g/m^3$). Over the years, the forms and levels of the federal PM10 standards were reviewed by U.S. EPA. Changes to the federal standards for PM10 became effective on December 17, 2006. U.S. EPA first proposed to revise the 24-hour PM10 standard by establishing a new indicator for coarse particles (particles generally between 2.5 and 10 µm in diameter, PM10-2.5), to include PM10-2.5 that is mainly generated by resuspended dust from high-density traffic on paved roads, industrial sources, and construction sources; but specifically excluding PM10-2.5 that is generated by rural windblown dust and soils and by agricultural and mining sources. U.S. EPA proposed to set the PM10-2.5 standard at a level of 70 $\mu g/m^3$. However, the coarse particle standard was not included as part of the final regulation which retained the 24-hour PM10 standard (150 $\mu g/m^3$). U.S. EPA also revoked the annual PM10 standard due to a cited lack of evidence of adverse health

[3] $\mu g/m^3$ = micrograms per cubic meter

effects linked to long-term exposure to coarse particles, beyond that already protected against by the PM2.5 annual standard. As part of the revision to the ambient air monitoring regulations in 2006, PM10-2.5 monitoring was required at National Core (NCore) multi-pollutant monitoring stations by January 1, 2011. Currently, the District measures PM10-2.5 at two NCore PM monitoring sites in the Basin (Central Los Angeles and Riverside-Rubidoux). In the most recent review of the PM standards completed in June of 2012, U.S. EPA did not propose changes to the PM10 standard.

PM2.5 Air Quality Standards

In 1997, U.S. EPA adopted new federal air quality standards for the subset of fine particulate matter, PM2.5, to complement existing PM10 standards that target the full range of inhalable particulate matter. The District began monitoring PM2.5 concentrations in 1999. Federal annual and 24-hour standards and a state annual standard for PM2.5 were established. In 2006, U.S. EPA significantly lowered the level of the 24-hour PM2.5 standard, from 65 $\mu g/m^3$ to 35 $\mu g/m^3$, while retaining the level of the annual PM2.5 standard at 15 $\mu g/m^3$.

In the 2006 PM NAAQS review, U.S. EPA determined that individuals with pre-existing heart and lung diseases, older adults, and children are at greater risk from the effects associated with fine PM exposures. Based on the results of the previous studies and an extensive new body of scientific evidence that links the negative health impacts of PM2.5 exposure on these and possibly additional sensitive subpopulations (e.g., fetuses (unborn babies), newborns, and genetically susceptible populations) at lower levels than previously understood, U.S. EPA has proposed to strengthen the annual PM2.5 standard. On June 14, 2012 U.S. EPA proposed a lower annual standard with a concentration range between 12 and 13 $\mu g/m^3$. The current 24-hour standard of 35 $\mu g/m^3$ is proposed to remain unchanged. In addition, U.S. EPA proposed a requirement for near-roadway PM2.5 monitoring in urban areas. They also proposed adjustments to the Air Quality Index (AQI), which is used to report current and forecasted pollutant levels, to be consistent with the current 24-hour and new proposed annual PM2.5 standards. Final action on the proposed PM2.5 standard is anticipated by December 14, 2012.

For the 3-year (2009-2011) PM2.5 annual design value (the 3-year average of the annual PM2.5 averages), the Basin exceeded the current federal annual PM2.5 standard at only one location, (in Northwestern Riverside County at Mira Loma). Lowering the annual standard concentration to 13 or 12 $\mu g/m^3$ would have resulted in 6 to 10 additional stations exceeding the annual standard level in 2011. Figure 1-5 shows the effect of the proposed annual PM2.5 standard on the Basin's attainment status, based on the 2009-2011 annual PM2.5 design values.

Recently, ultrafine particles (UFP; diameter less than 0.1 µm) have received particular attention due to their ability to penetrate deep into the human respiratory tract, cross into the blood stream and other organs, and to cause adverse health effects in humans. However, UFPs are not currently regulated by the U.S. EPA (see Chapter 9 of the 2012 AQMP for additional details). Table 1-4 summarizes the history of the PM NAAQS to date.

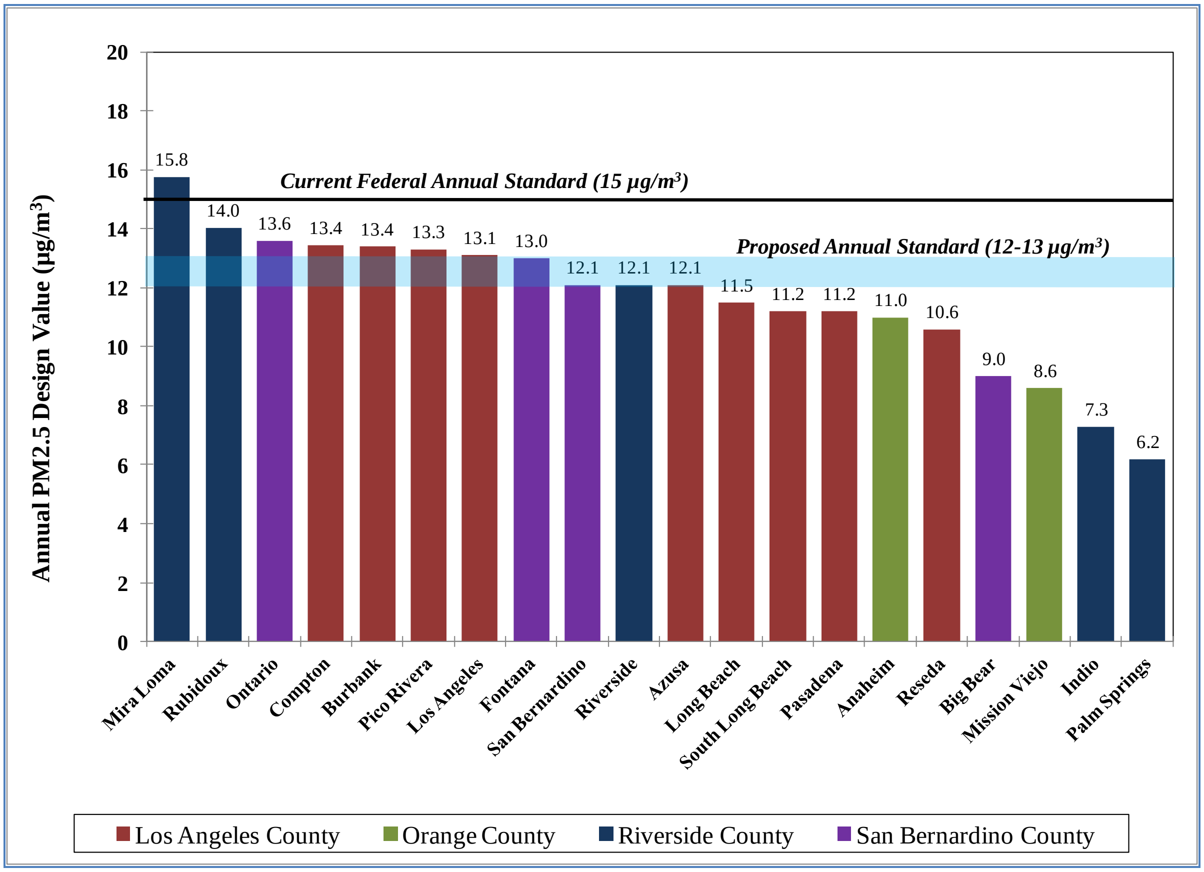


FIGURE 1-5

Annual PM2.5 3-Year (2009-2011) Design Values by Station Compared to Current and Proposed Federal Standards

TABLE 1-4

Summary of National Ambient Air Quality Standards (NAAQS) for Particulate Matter, 1971-Present (with Proposed)

Year of Final Rule	Indicator	Averaging Time	Level ($\mu g/m^3$)
1971	TSP - Total Suspended Particles ($\leq$ 25-45 μm)	24-hour	260
		Annual	75
1987	PM10	24-hour	150
		Annual	50
1997	PM2.5	24-hour	65
		Annual	15
	PM10	24-hour	150
		Annual	50
2006	PM2.5	24-hour	35
		Annual	15
	PM10	24-hour*	150
		Annual	(revoked)
2012 (proposed)	PM2.5	24-hour	35
		Annual	12-13**
	PM10	24-hour	150

* In the 1997 revision of the 24-hour PM10 standard, the form of the standard was revised to 99th percentile, averaged over 3 years. When the 1997 standards were vacated, the form of 1987 standards remained in place (not to be exceeded more than once per year averaged over 3 years).

** A lower PM2.5 annual standard was proposed by U.S. EPA on June 14, 2012, with comments solicited on a concentration range from 12 to 13 $\mu g/m^3$

Ozone Properties

The Basin's unique air pollution problem was first recognized in the 1940's. The Los Angeles urban area smog was worse than other areas. Early research showed that ozone was being formed in the Basin's atmosphere from VOCs and NOx being emitted into the air in the presence of steady sunshine and trapped laterally by the mountainous terrain and vertically by strong low-altitude temperature inversions that act as a lid to vertical mixing of air. Regular monitoring of total oxidants was begun by the Los Angeles Air Pollution Control District (LAAPCD) in the 1950's, and annual maximum 1-hour ozone concentrations in excess of 0.60 ppm (600 ppb) were recorded at that time.

Ozone (O_3), a colorless gas with a sharp odor at very high concentrations, is a highly reactive form of oxygen. High ozone concentrations exist naturally high above the earth in the stratosphere. Some mixing of stratospheric ozone downward to the earth's surface does occur; however, the extent of ozone transport from aloft is limited. At the earth's surface in sites remote from urban areas, ozone concentrations are normally very low (0.03-0.05 ppm).

In urban areas, ozone is formed by a complicated series of chemical and photochemical reactions between VOCs, NOx, and the oxygen in the air. A decrease in ozone precursors may or may not result in a linear decrease in ozone. Ozone concentrations are dependent not only on overall precursor levels, but also on the ratio of the concentrations of VOCs to NOx , the reactivity of the specific VOCs present, the spatial and temporal distribution of emissions, the level of solar radiation, and other weather factors.

While ozone is beneficial in the stratosphere because it blocks skin-cancer-causing ultraviolet radiation, it is a highly reactive oxidant. It is this reactivity which accounts for its damaging effects on materials, plants, and human health at the earth's surface.

The propensity of ozone to react with organic materials causes it to be damaging to living cells, and ambient ozone concentrations in the Basin are frequently sufficient to cause adverse health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection. People with respiratory diseases, children, the elderly, and people who exercise heavily are more susceptible to the effects of ozone.

Plants are sensitive to ozone at concentrations well below the health-based standards and ozone is responsible for significant crop damage and damage to forests and other ecosystems.

Ozone Air Quality Standards

Studies have shown that even relatively low concentrations of ozone, if lasting for several hours, can significantly reduce lung function in normal healthy people. Effective September 16, 1997, the U.S. Environmental Protection Agency (U.S. EPA) adopted an

8-hour average federal ozone standard with a level of 0.08 ppm (not to exceed), intending to replace the 1-hour standard that was adopted in 1979 (0.12 ppm, not to exceed). This 8-hour ozone standard was more stringent than the 1-hour standard (0.12 ppm) and provided greater protection to public health. The 8-hour standard is intended to help protect people who spend a significant amount of time working or playing outdoors, a group that is particularly vulnerable to the effects of ozone. (Due to the monitoring and reporting requirements of the older ozone standards, a level of 0.085 ppm or 85 ppb is required to exceed the 1997 8-hour standard and 0.125 ppm or 125 ppb is required to exceed the 1979 1-hour standard.)

The U.S. EPA eventually revoked the 1979 federal 1-hour ozone standard, effective June 15, 2005. However, the South Coast Air Basin and the former Southeast Desert Modified Air Quality Management Area (which included the Coachella Valley) had not attained the 1-hour federal ozone standard by the attainment date and have some continuing obligations under the former standard.

The 8-hour standard was subsequently lowered from 0.08 to 0.075 ppm (75 ppb, not to exceed, i.e., 76 ppb exceeds), effective May 27, 2008. However, nonattainment areas of the 1997 8-hour ozone standard still have some continuing obligations to demonstrate attainment of that standard by the applicable attainment date. In 2010, U.S. EPA proposed to lower the 8-hour ozone standard again and solicited comments on a proposed standard between 0.060 and 0.070 ppm. U.S. EPA did not take final action on a lower ozone standard and the NAAQS currently remains at the 0.075 ppm, as established in 2008. Potential new ozone standards are under review with proposed regulations expected by 2014. Statistics presented in this Appendix refer to both the current (2008) 8-hour standard and the former 1997 8-hour and 1979 1-hour standards for purposes of historical comparison and assessment of progress towards attainment of those standards.

The State of California Air Resources Board (CARB), established a new 8-hour average state ozone standard (0.070 ppm), effective May 17, 2006. The earlier state 1-hour ozone standard (0.09 ppm) also continues to remain in effect. Comparisons of the current (2008) and 1997 8-hour ozone standards, along with the former 1-hour ozone standard, for the Basin and the Coachella Valley can be found in Chapters 2 and 7.

While the 1-hour ozone episode levels and the related health warnings still exist, they are essentially replaced by the more protective health warnings associated with the current NAAQS. The 1-hour O_3 episode warning levels include the state Health Advisory (0.15 ppm), Stage 1 (0.20 ppm), Stage 2 (0.35 ppm) and Stage 3 (0.50 ppm). Only the lowest of these 1-hour episode thresholds, the state Health Advisory, was exceeded in 2011. The last 1-hour O_3 Stage 1 episode occurred in 2003. The last Stage 2 episode occurred in 1988, and the last Stage 3 episode occurred in 1974.

CO Properties

Carbon monoxide (CO) is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, carbon monoxide occurs in air at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline. In 2000, 98 percent of the CO emitted into the Basin's atmosphere was from mobile sources. Consequently, CO concentrations are generally highest in the vicinity of major concentrations of vehicular traffic. CO concentrations have continued to decrease due to reformulated fuels and more efficient combustion in newer vehicles.

As a primary pollutant, carbon monoxide is directly emitted into the air, and not formed in the atmosphere by chemical reaction of precursors as is the case with ozone and other secondary pollutants. Ambient concentrations of CO in the Basin exhibit large spatial and temporal variations, due to variations in the rate and locations at which CO is emitted, and in the meteorological conditions that govern transport and dilution. Unlike ozone, CO tends to reach high concentrations in the fall and winter months. The highest concentrations frequently occur on weekdays at times consistent with rush hour traffic and late at night during the coolest, most atmospherically stable portion of the day.

When carbon monoxide is inhaled in sufficient concentration, it can displace oxygen and bind with the hemoglobin in the blood, reducing the capacity of the blood to carry oxygen. Individuals most at risk from the effects of CO include heart patients, fetuses (unborn babies), smokers, and people who exercise heavily. Normal healthy individuals are affected at higher concentrations, which may cause impairment of manual dexterity, vision, learning ability, and performance of work. The results of studies concerning the combined effects of CO and other pollutants in animals have shown a synergistic adverse effect after exposure to CO and ozone.

CO Air Quality Standards

The state and federal CO standards have been reviewed recently, with no changes recommended. The CO standards are based on both short-term (1-hour; 35 ppm federal and 20 ppm state) and longer-term (8-hour; 9 ppm federal and 9.0 ppm state) exposures.

NO_2 Properties

Nitrogen dioxide (NO_2) is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from nitrogen (N_2) and oxygen (O_2) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts with the oxygen in air to give NO_2. NO_2 is largely responsible for the brownish tinge of polluted urban air. The two gases, NO and NO_2, are referred to collectively as oxides of nitrogen (NOx). In the presence of sunlight, NO_2 reacts to produce nitric oxide and an oxygen atom. The oxygen atom can react further to produce ozone, via a complex series of chemical reactions involving hydrocarbons (VOCs). NO_2 may also react to produce nitric acid (HNO_3) which reacts further to produce nitrates, which are a component of PM.

NO_2 is a respiratory irritant and reduces resistance to respiratory infection. Children and people with respiratory disease are most susceptible to its effects.

NO_2 Standards

U.S. EPA has established a new primary NO_2 1-hour standard to supplement the existing annual standard, at a level of 100 ppb (based on the 3-year average of the annual 98^{th} percentile of 1-hour daily maximum concentrations for each station). U.S. EPA has also established new requirements for the NO_2 monitoring network in large metropolitan areas that will include monitors at locations within 50 meters of major roadways. This near-source monitoring requirement is in addition to the ambient monitoring requirements to measure the area-wide NO_2 concentrations that occur more broadly across communities. This rule became effective on April 12, 2010. The 1971 annual NO_2 federal standard (0.053 ppm) remains in effect. Effective March 20, 2008, the California Air Resources Board (CARB) revised the state NO_2 1-hour state standard from 0.25 ppm to 0.18 ppm, and established a new annual state standard of 0.030 ppm.

SO_2 Properties

Sulfur dioxide (SO_2) is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H_2SO_4), which contributes to acid deposition, and sulfates, which is a component of PM10 and PM2.5. Most of the SO_2 emitted into the atmosphere is produced by the burning of sulfur-containing fuels.

At sufficiently high concentrations, sulfur dioxide affects breathing and the defenses of the lungs, and it can aggravate respiratory and cardiovascular diseases. Asthmatics and people with chronic lung disease or cardiovascular disease are most sensitive to its effects. Sulfur dioxide also causes plant damage, damage to materials, and acidification of lakes and streams.

SO_2 Standards

U.S. EPA established a new 1-hour SO_2 standard at a level of 75 ppb, based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations and has revoked both the 24-hour and annual primary SO_2 standards, effective June 2, 2010.

Sulfate Properties

Sulfates are chemical compounds which contain the sulfate ion (SO_4^{2-}) and are part of the mixture of solid materials which make up PM2.5, PM10 and TSP. Most of the sulfates in the atmosphere are produced by oxidation of sulfur dioxide. Oxidation of sulfur dioxide yields sulfur trioxide (SO_3) which reacts with water to produce sulfuric acid (H_2SO_4), which contributes to acid deposition. The reaction of sulfuric acid with basic substances such as ammonia yields sulfates, a component of PM.

Lead (Pb) Properties

Lead in the atmosphere is present as a mixture of a number of lead compounds. Leaded gasoline and lead smelters had historically been the main Basin sources of lead emitted into the air. Due to the phasing out of leaded gasoline, there has been a dramatic reduction in atmospheric lead in the Basin over the past three decades.

Lead Standards

The national standard for Lead (Pb) was revised on October 15, 2008 from a quarterly average of 1.5 $\mu g/m^3$ to a rolling 3-month average of 0.15 $\mu g/m^3$, with a maximum (not-to-be-exceeded) form, evaluated over a 3-year period (36 months). The current indicator of Pb in total suspended particles (Pb-TSP) was retained. The revision became effective on January 12, 2009.

U.S. EPA has also enhanced the Pb monitoring requirements in its 2008 NAAQS revisions, requiring air monitoring near Pb sources with potential 3-month average Pb concentration exceeding the revised standard of 0.15 $\mu g/m^3$. Pb monitoring is required in large urban areas with monitors located to measure Pb concentrations in areas impacted by resuspended dust from roadways, nearby industrial sources identified as significant Pb sources, hazardous waste sites, construction and demolition projects, or other fugitive dust sources of Pb. Following a petition in 2009, U.S. EPA revised the monitoring requirements, lowering the emission threshold at which monitoring is required for both source-oriented and large urban area-based non-source oriented monitoring. The monitoring revision became effective in January 2011. In 2011, the District's Pb monitoring network included 10 regular monitoring sites and an additional six source-specific sites, one of which exceeded the revised Pb standard (at a lead source in the City of Vernon, Los Angeles County). A separate Pb SIP addressing the 2008 Pb standard was submitted to U.S. EPA in June 2012.

Chapters 2 and 3 contain summaries of air quality in the South Coast Air Basin (Basin), and the Riverside County (Coachella Valley) portion of the Salton Sea Air Basin (SSAB), respectively. For ozone, PM10, and PM2.5, the pollutants for which the Basin is still designated as nonattainment of the federal standards, maps are presented which show the geographical air quality variability. Detailed air quality statistics for each of the District's monitoring locations in the Basin and SSAB are contained in the Attachment to this report, for the years 1995 through 2011. Please refer to Appendix II from the 2003 AQMP for the 1976-1989 prior-year statistics and to Appendix II from the 2007 AQMP for 1990-2005 data.

CHAPTER 2

AIR QUALITY IN THE SOUTH COAST AIR BASIN

Air Quality in the South Coast Air Basin

Violations of Standards
Design Values and NAAQS Attainment Status
Air Quality Compared to Other U.S. Metropolitan Areas
Air Quality Trends
Spatial and Temporal Variability

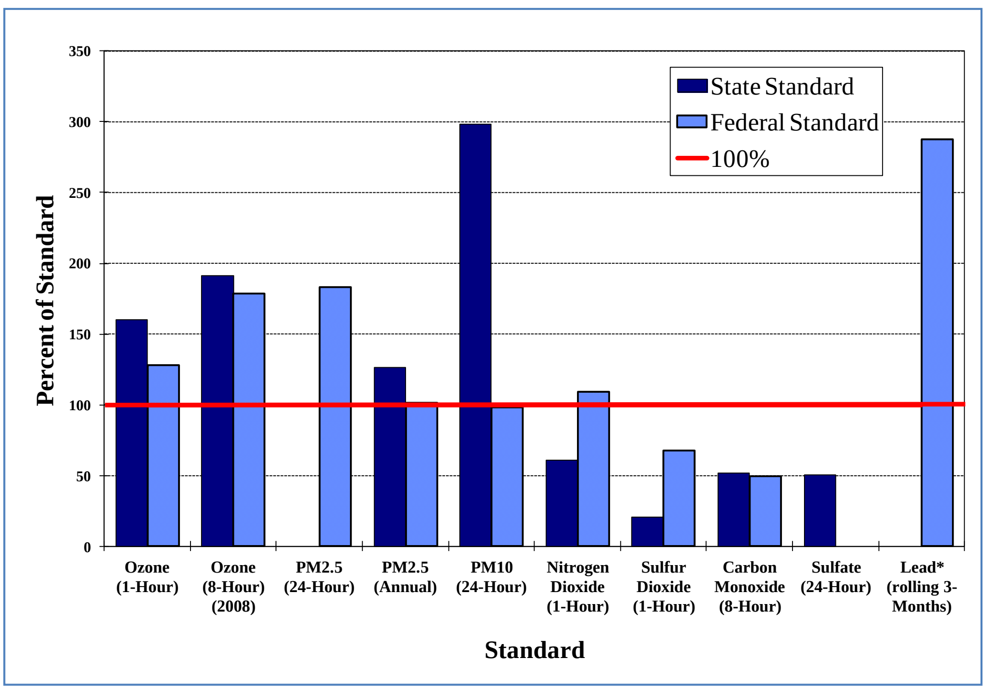
Pollutant-Specific Air Quality Discussion

Particulate Matter (PM)
Ozone (O_3)
Nitrogen Dioxide (NO_2)
Carbon Monoxide (CO)
Sulfur Dioxide (SO_2)
Sulfate (SO_4^{2-})
Lead (Pb)

AIR QUALITY IN THE SOUTH COAST AIR BASIN

Violations of Standards

In the South Coast Air Basin (Basin), the maximum pollutant concentrations measured at District monitoring stations in 2011 exceeded the levels of the federal and state standards for ozone (O_3), PM2.5, nitrogen dioxide (NO_2), and lead (Pb). In the year 2011, a total of 125 days exceeded the levels of the current short-term (24-hour average or less) federal standards for 8-hour O_3, 1-hour NO_2, or 24-hour PM2.5 at one or more Basin locations. As discussed below, the NO_2 reading did not cause a "violation" of the standard. The more stringent state 8-hour O_3 or 24-hour PM10 standards were exceeded on 137 days (based on the FRM filter data for PM10, which is not sampled every day). While the Basin exceeded the state annual and 24-hour PM10 standards, it did not exceed the 24-hour federal standard. The federal and state annual PM2.5 standards were exceeded in the Basin in 2011, with only one station exceeding the federal standard. While the state PM10 annual standard was exceeded, the revoked federal annual PM10 standard was not. The other criteria pollutants, sulfur dioxide (SO_2), carbon monoxide (CO), and sulfate (SO_4^{2-}), did not exceed federal or state standards. Figure 2-1 shows the Basin maximum pollutant concentrations for 2011, as a percentage of the federal and state standards.



* High lead concentrations recorded at monitoring sites adjacent to sources known to emit lead

FIGURE 2-1

2011 South Coast Air Basin Maximum Pollutant Concentrations
(as Percent of State and Federal Standards)

Design Values and NAAQS Attainment Status

As shown above, the Basin exceeded the pollutant concentration levels defined by the National Ambient Air Quality Standards (NAAQS) for ozone, PM2.5, NO_2, and Pb. However, attainment of the NAAQS is measured with the three-year design values that take into account the form of the federal standards and multi-year averages, as detailed previously in Table 1-3. The exceedances of the NO_2 standard level on one day in 2011 at two stations did not constitute a violation of the NAAQS or affect the Basin's NO_2 designation. The Basin did not exceed the federal standard for PM10 in 2011, or any year since 2008; the exceedances in 2007 and 2008 were flagged in the U.S. EPA AQS database to request exclusion from attainment consideration under the U.S. EPA Exceptional Events Rule. Figure 2-2 shows the federal ozone and PM design value status for the Basin, along with the Coachella Valley, for the 2009-2011 3-year period. The current U.S. EPA NAAQS attainment designations for the Basin are presented in Table 2-1.

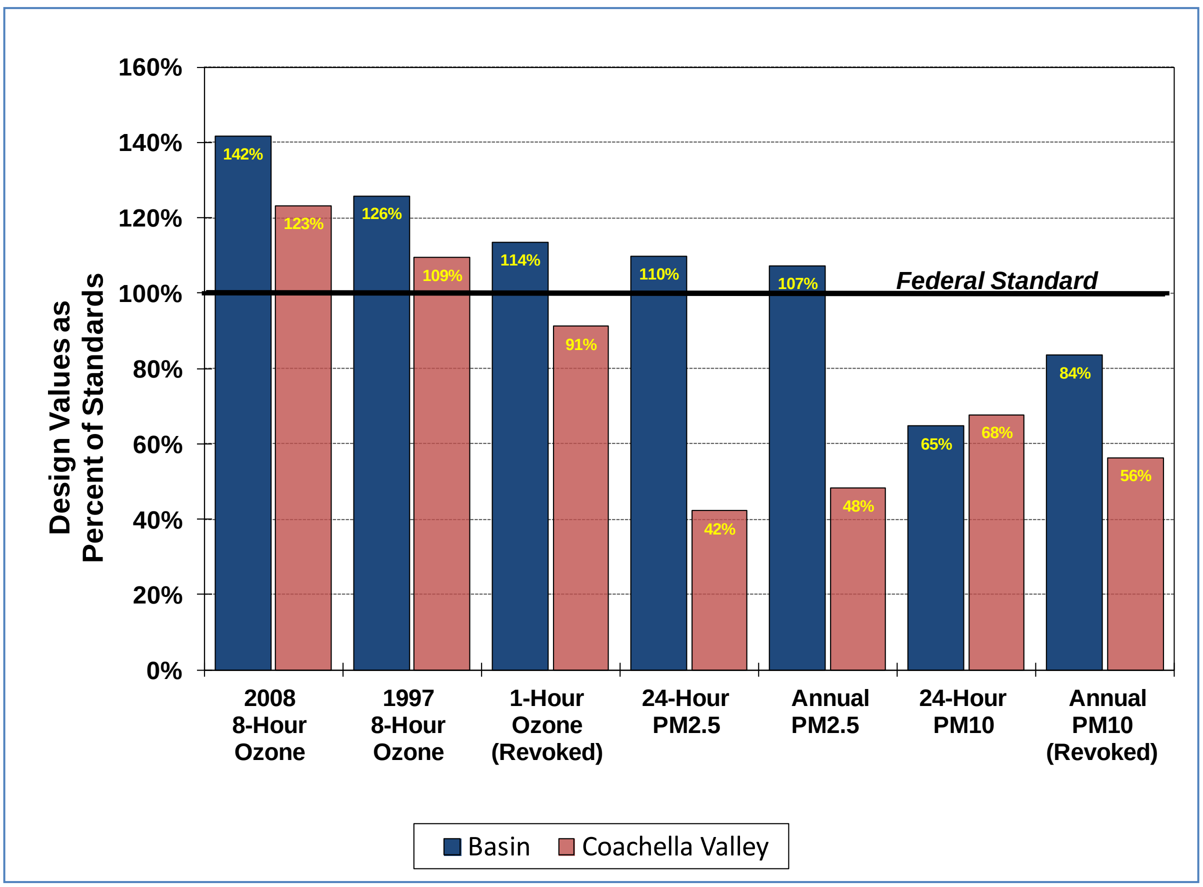


FIGURE 2-2

South Coast Air Basin and Coachella Valley 3-Year (2009-2011) Design Values
(Percentage of Federal Standards, by Criteria Pollutant)

TABLE 2-1

National Ambient Air Quality Standards (NAAQS) Attainment Status
South Coast Air Basin

Criteria Pollutant	Averaging Time	Designation[a)]	Attainment Date[b)]
1979 **1-Hour Ozone**[c)]	1-Hour (0.12 ppm)	Nonattainment (Extreme)	11/15/2010 (not attained)
1997 **8-Hour Ozone**[d)]	8-Hour (0.08 ppm)	Nonattainment (Extreme)	6/15/2024
2008 **8-Hour Ozone**	8-Hour (0.075 ppm)	Nonattainment (Extreme)	12/31/2032
CO	1-Hour (35 ppm) 8-Hour (9 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
NO_2[e)]	1-Hour (100 ppb)	Unclassifiable/Attainment	N/A
	Annual (0.053 ppm)	Attainment (Maintenance)	9/22/1998
SO_2[f)]	1-Hour (75 ppb)	Designations Pending	N/A
	24-Hour (0.14 ppm) Annual (0.03 ppm)	Unclassifiable/Attainment	3/19/1979 (attained)
PM10	24-hour (150 μg/m^3)	Nonattainment (Serious)[g)]	12/31/2006 (redesignation request submitted)[g)]
PM2.5	24-Hour (35 μg/m^3)	Nonattainment	12/14/2014[h)]
	Annual (15.0 μg/m^3)	Nonattainment	4/5/2015
Lead (Pb)	3-Months Rolling (0.15 μg/m^3)	Nonattainment (Partial)[i)]	12/31/2015

a) U.S. EPA often only designates Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable

b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for attainment demonstration

c) 1979 1-hour O_3 standard (0.12 ppm) was revoked, effective June 15, 2005 ; however, the Basin did not attain this standard based on 2008-2010 data and has continuing obligations under the former standard

d) 1997 8-hour standard (0.08 ppm) was reduced (0.075 ppm), effective May 27, 2008; the 1997 O_3 standard and most related implementation rules remain in place until the 1997 standard is revoked by U.S. EPA

e) New NO_2 1-hour standard, effective August 2, 2010; attainment designations January 20, 2012; annual NO_2 standard retained

f) The 1971 annual and 24-hour SO_2 standards were revoked, effective August 23, 2010; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO_2 1-hour standard. Area designations are expected in 2013, with the Basin likely designated Unclassifiable /Attainment

g) Annual PM10 standard was revoked, effective December 18, 2006; redesignation request to attainment of the 24-hour PM10 standard is pending with U.S. EPA

h) Attainment deadline for the 2006 24-Hour PM2.5 NAAQS is December 14, 2014

i) Pb partial nonattainment designation – Los Angeles County portion of the Basin only

Air Quality Compared to Other U.S. Metropolitan Areas

Despite significant improvement, the Basin still has some of the worst air quality in the nation in terms of the number of days per year exceeding the federal standards. In 2011, the U.S. location with the highest number of days over the federal 8-hour average ozone standard was located in the Basin (Central San Bernardino Mountains-Crestline, 84 days). The Basin exceeded the 24-hour average PM2.5 standard on multiple days, but the 98th percentile PM2.5 concentration (which is used to compare with the federal PM2.5 standard) exceeded the standard at one location only in Northwestern Riverside County (Mira Loma). The Basin did not exceed the federal 24-hour average and annual PM10 standards in 2011.

Figures 2-3 and 2-4 show maximum pollutant concentrations in 2011 for the Basin compared to other urban areas in the U.S. and California, respectively. Maximum concentrations in all of these areas exceeded the 2008 federal 8-hour average O_3 standard. The annual PM2.5 standard was exceeded in the South Coast Air Basin and in one other California air basin (San Joaquin Valley). The 24-hour PM2.5 standard, however, was exceeded in a few of the other large U.S. urban areas and in many California air basins. The 24-hour PM10 standard was exceeded in one of the U.S. urban areas shown (Phoenix), although potential flagging of exceptional events may affect the treatment of that data. It is important to note that maximum pollutant concentrations do not necessarily indicate potential NAAQS violations and subsequent nonattainment designations, as the design values that are used for attainment status are based on the form of the standard.

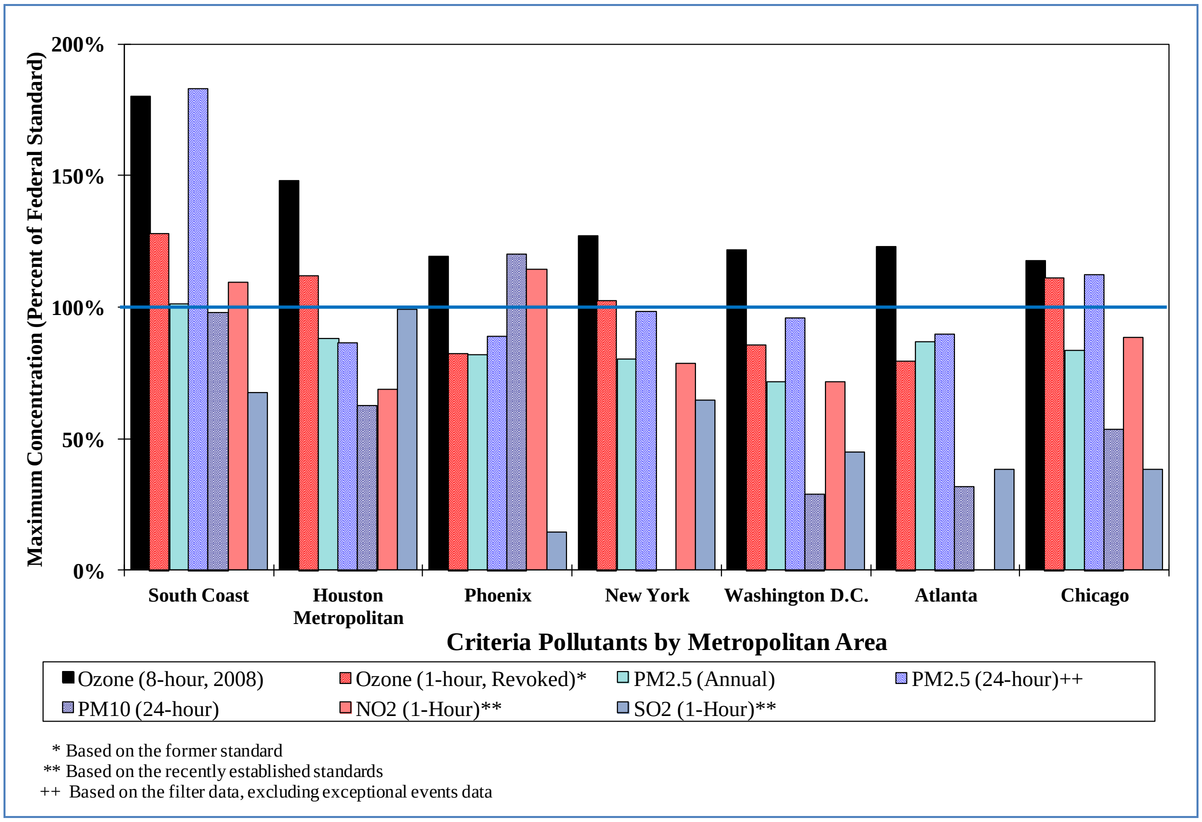


FIGURE 2-3

2011 South Coast Air Basin Air Quality Compared to Other U.S. Urban Areas
(Maximum Pollutant Concentrations as Percentages of the Corresponding Federal Standards)

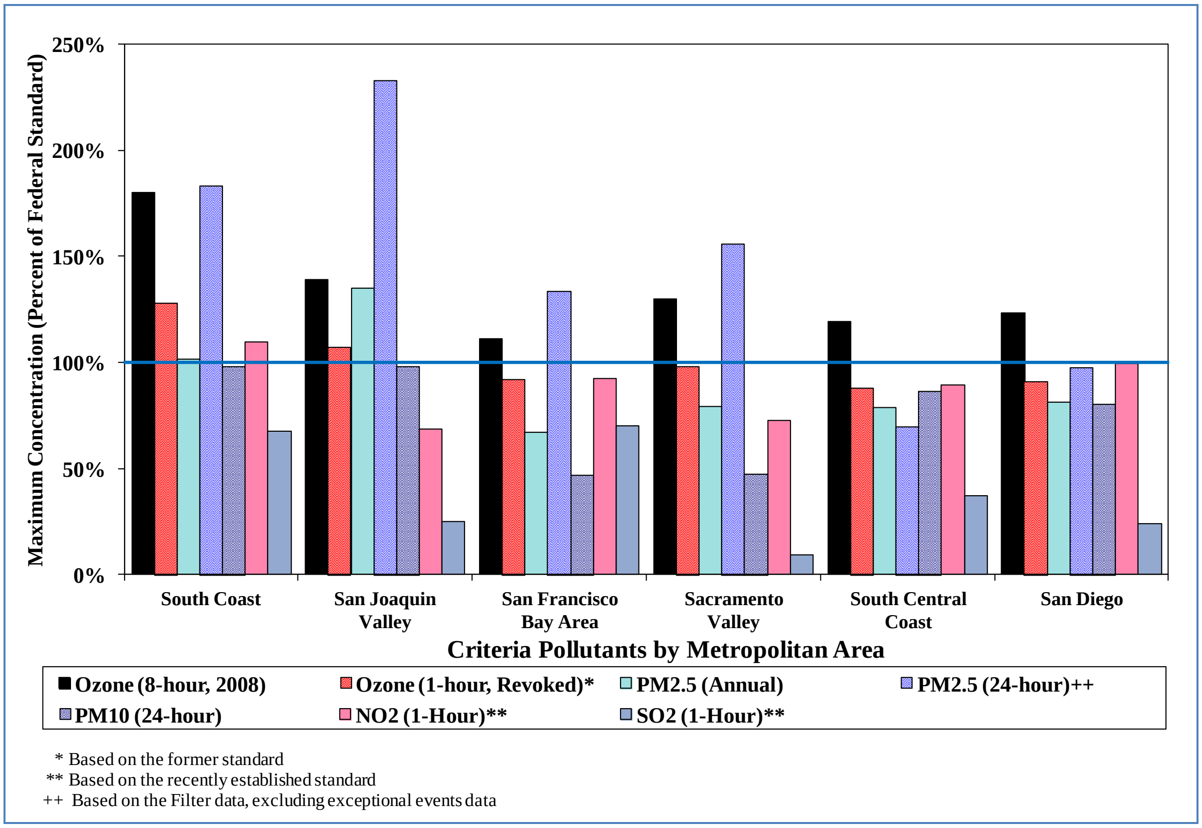


FIGURE 2-4

2011 South Coast Air Basin Air Quality Compared to Other California Air Basins
(Maximum Pollutant Concentrations as Percentages of the Corresponding Federal Standards)

NO_2 concentrations exceeded the recently established 1-hour standard in the Basin and Phoenix (on one day each). Denver, Colorado (not shown in Figure 2-3), was the only other U.S. urban area exceeding the NO_2 standard in 2011. SO_2 concentrations were below the recently established 1-hour federal standard in the Basin and all of the urban areas shown in Figures 2-3 and 2-4. However, the SO_2 standard was exceeded in other U.S. areas, with the highest concentrations recorded in Hawaii, due to volcanic emissions. The CO standards were not exceeded in the U.S. in 2011.

In 2011, the Central San Bernardino Mountains area in the Basin recorded the highest maximum 1-hour and 8-hour average ozone concentrations in the nation (0.160 and 0.136 ppm, respectively). The highest 8-hour average concentration was more than one and a half times the federal standard level. In 2011, seven out of ten stations with the highest maximum 8-hour average ozone concentrations in the nation were located in the Basin[4]. The South Coast Air Basin also exceeded the 8-hour ozone standard on more

[4] The 10 highest measured O_3 concentrations in 2011 included 7 Basin stations: Central San Bernardino Mountains (Crestline), East San Bernardino Valley (Redlands), Central San Bernardino Valley (Fontana and San Bernardino), Santa Clarita Valley (Santa Clarita), Northwest San Bernardino Valley (Upland), and Metropolitan Riverside (Rubidoux).

days (106) than most other urban areas in the country in 2011, with only California's San Joaquin Valley exceeding on more days (109).

Air Quality Trends

There have been significant improvements in the Basin's air quality over the years since measurements began, with PM2.5 showing the most dramatic improvement in recent years. Figure 2-5 shows the trend (1990-2011) of *basin-days*[5] exceeding the federal standards for ozone and particulates, as a percentage of days with monitoring data. Figure 2-6 shows the trend of maximum pollutant concentrations in the Basin for the past two decades, as percentages of the corresponding federal standards. Note that this is based on maximum concentrations and that actual attainment of the standards is based on the design value. The pollutant-specific sections of this chapter contain additional trends by pollutant.

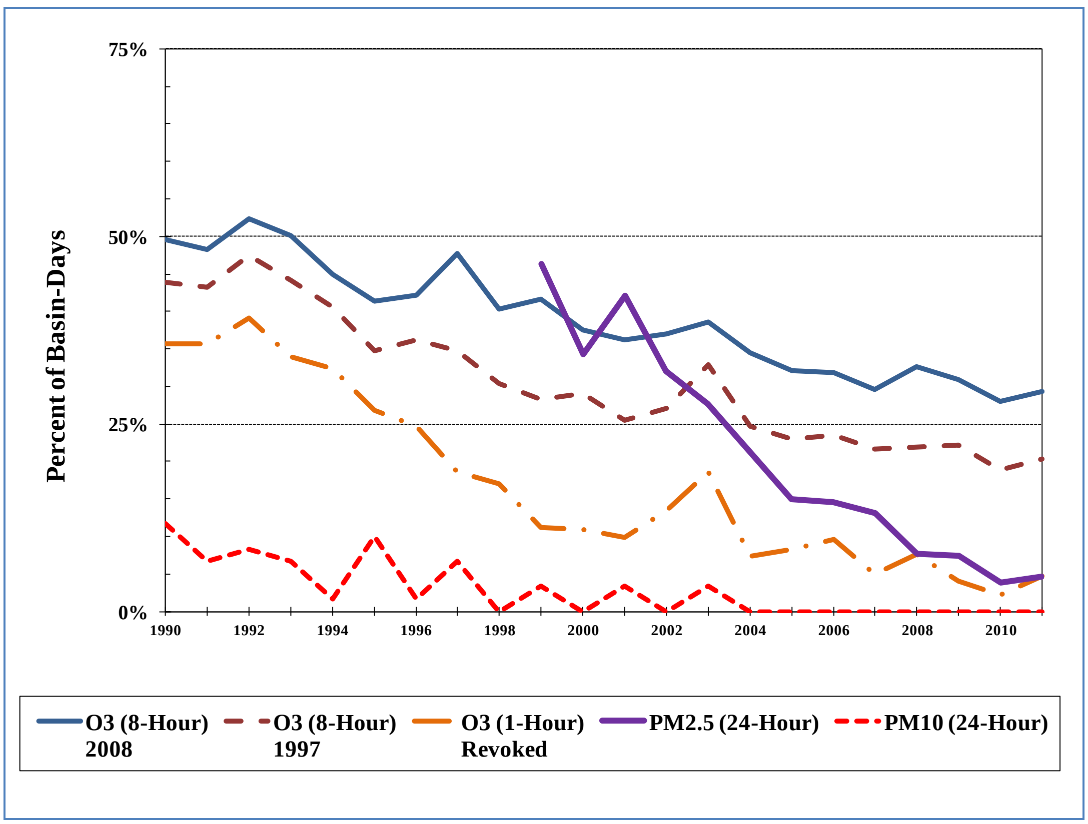


FIGURE 2-5

Trend of Basin-Days Exceeding Federal Standards, 1990-2011

[5] A "basin-day" is recorded if one or more locations in the air basin exceeded the level of the standard. Multiple locations exceeding on the same day count as a single basin-day.

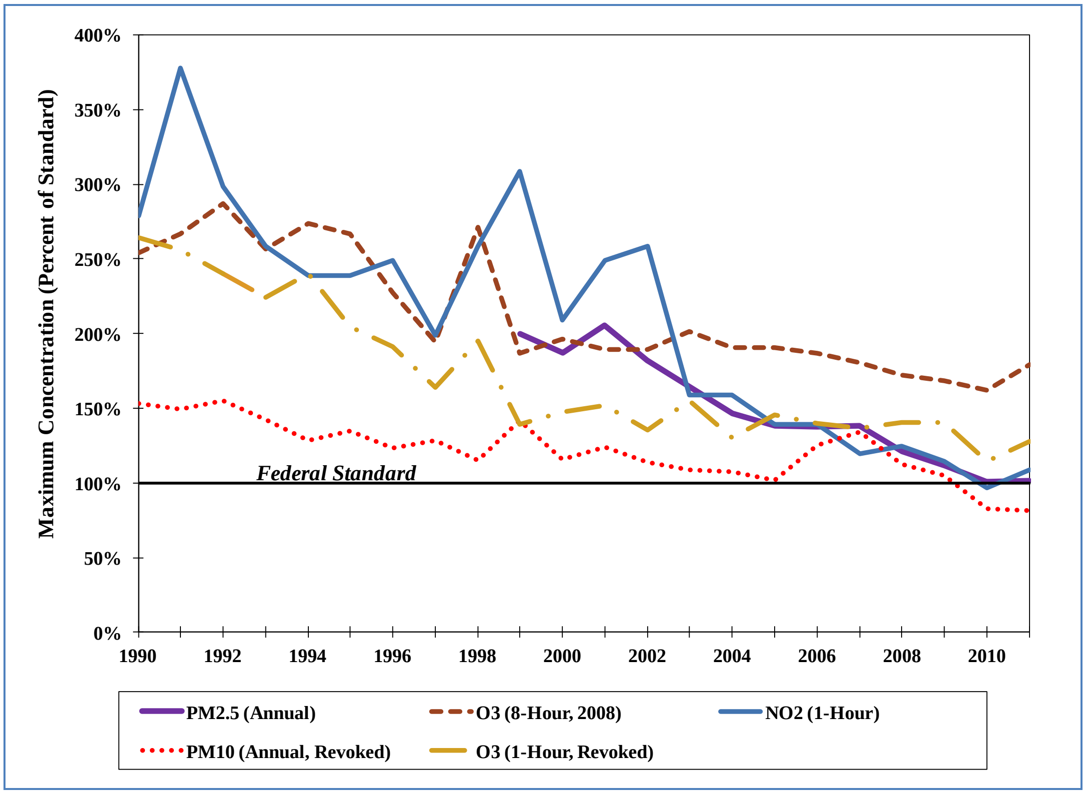


FIGURE 2-6

Trends of South Coast Air Basin Maximum Pollutant Concentrations
(Percentages of Federal Standards)

Spatial and Temporal Variability

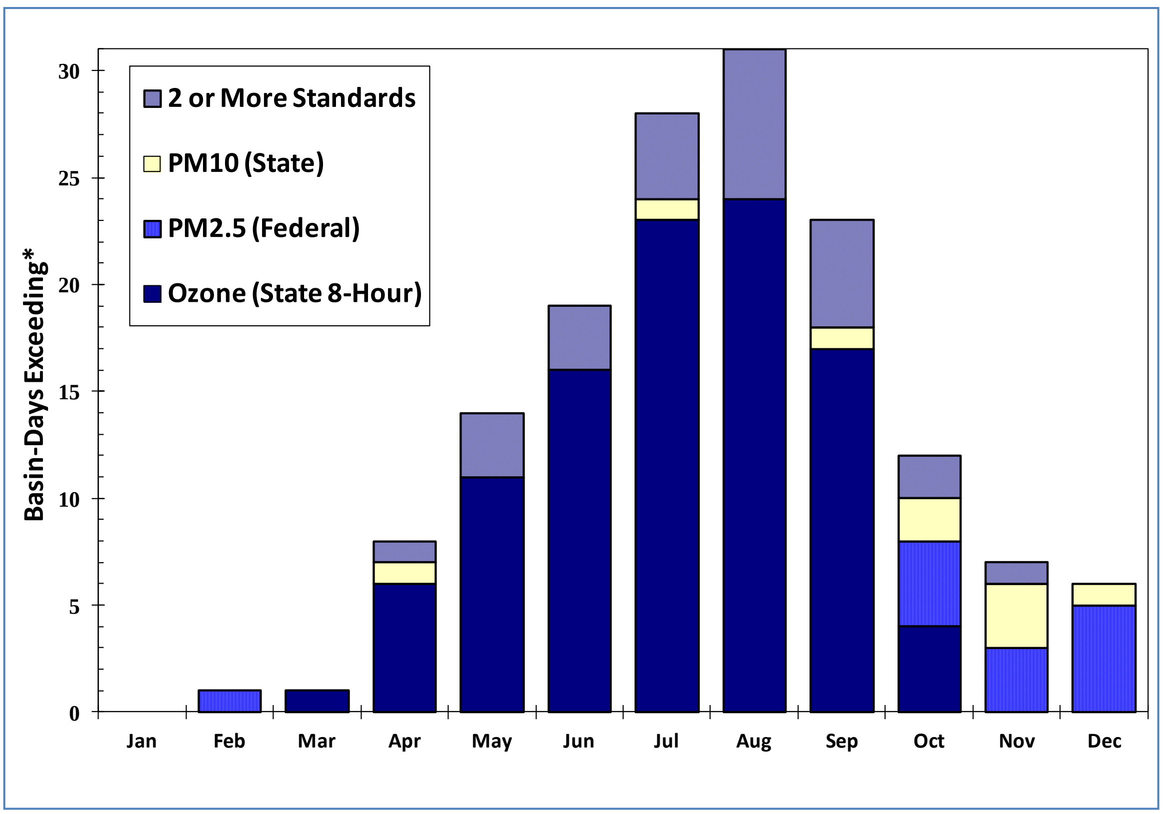
Air quality in the Basin varies widely by season and by area. The highest pollutant concentrations were all recorded in, or downwind of, the densely populated areas of the Basin. The number of days exceeding the current (2008) 8-hour federal ozone standard (0.075 ppm[6], or 75 ppb[7], not to exceed) varied widely by location, from zero to 84 days. Exceedances were fewest along the coast, increasing in the inland valleys to a maximum in the Basin's Central San Bernardino Mountains. The District station in the Central San Bernardino Mountains area (Crestline-Lake Gregory) exceeded the 2008 federal 8-hour average ozone standard most frequently (84 days).

Ozone concentrations tend to be higher on weekends than on weekdays, although this difference is less distinct in recent years. The time of day with highest average ozone concentrations is in the early to middle afternoon, although the inland areas of the Basin will peak later in the afternoon on the higher days. Day-of-week and time-of-day PM2.5 concentrations vary considerably by location but, overall for 2009-2011, weekday

[6] ppm = parts per million, by volume
[7] ppb = parts per billion, by volume; 1 ppm = 1000 ppb

PM2.5 concentrations were slightly higher on Fridays and daily peaks occur in the morning, after the period of heaviest traffic.

The Basin's air quality concentrations and the occurrence of exceedances vary with season due to seasonal differences in the weather, sunlight for photochemical reactions, and to a lesser extent, seasonal variations in emissions. High ozone concentrations are generally recorded during the May to October "smog season" and exceedances of the federal and state standards are most frequent in July and August. Particulate matter (PM10 and PM2.5) levels do not have as clear of a pattern as ozone, and high concentrations may be recorded throughout the year. However, high PM10 and PM2.5 concentrations are typically recorded during late fall and winter months. Figure 2-7 shows the number of Basin-wide days per month when the most stringent of the state or federal standards were exceeded in the Basin in 2011. Additional spatial and temporal analyses are presented in the pollutant-specific sections that follow.



* The term Basin-days represents the number of days a standard was exceeded by at least one monitoring station in the Basin

FIGURE 2-7

Number of Basin-Days per Month Exceeding the Most Stringent State or Federal Standards in 2011

POLLUTANT-SPECIFIC AIR QUALITY DISCUSSION

Particulate Matter (PM)

PM10 and PM2.5 concentrations are monitored throughout the District by samples collected on quartz or teflon filters in samplers with size selective inlets; this is known as the Federal Reference Method (FRM). Some stations also have continuous monitors, using either Beta Attenuation Monitor (BAM) or Tapered Element Oscillating Microbalance (TEOM) instrumentation. This data is available in real-time and is used for air quality forecasting and public reporting of current conditions. Where the continuous BAM or TEOM PM10 monitors have been certified by U.S. EPA to be Federal Equivalent Methods (FEM), the continuous PM10 data is averaged for the 24-hour period (midnight to midnight) and used for comparison to the standards on days when a valid FRM filter measurement was not collected. For PM2.5, there are significant differences between the FEM and FRM results that have been recognized by national assessments of the technologies. The District measures FRM PM2.5 on a daily basis at the critical stations in the Basin, and does not use the FEM PM2.5 data to compare to the NAAQS. This issue is being explicitly addressed in U.S. EPA's new proposed PM2.5 NAAQS, and future use of FEM data will be consistent with the final federal requirements. In 2011, the District measured PM10 and PM2.5 concentrations at 25 and 21 locations, respectively, including two locations in the Coachella Valley for both. Figures 2-8 and 2-9 show the PM2.5 and PM10 monitoring sites, respectively, in the District's jurisdiction.

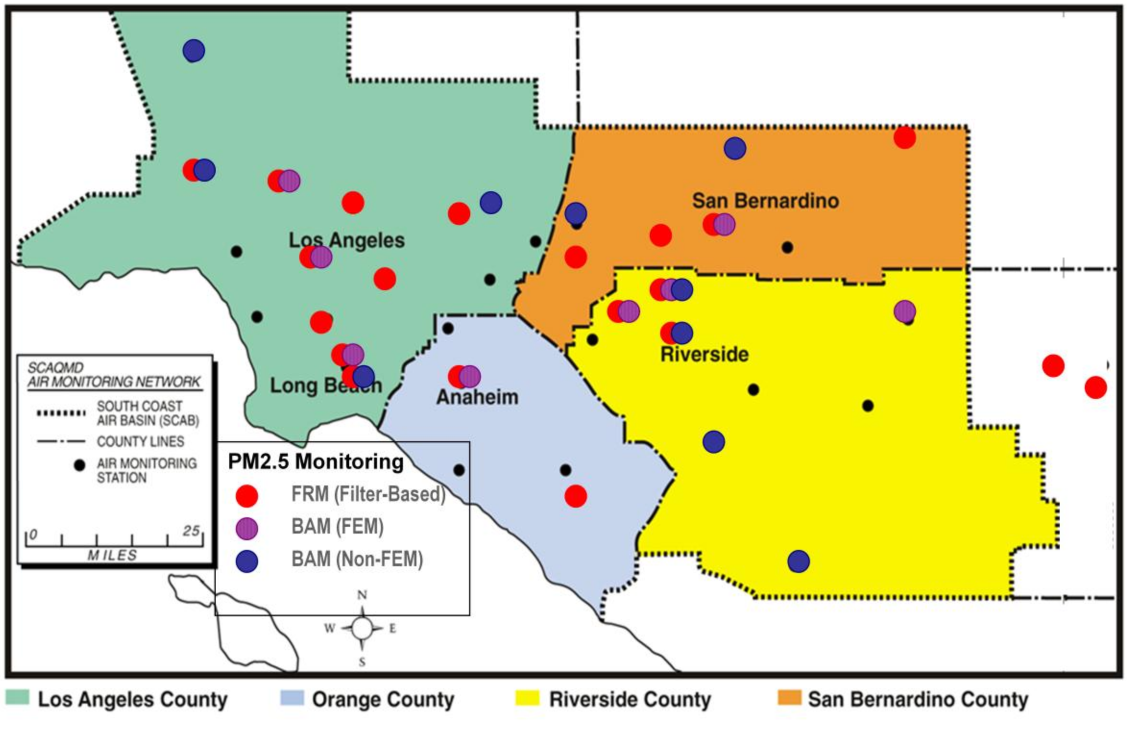


FIGURE 2-8
South Coast Air Quality Management District PM2.5 Air Monitoring

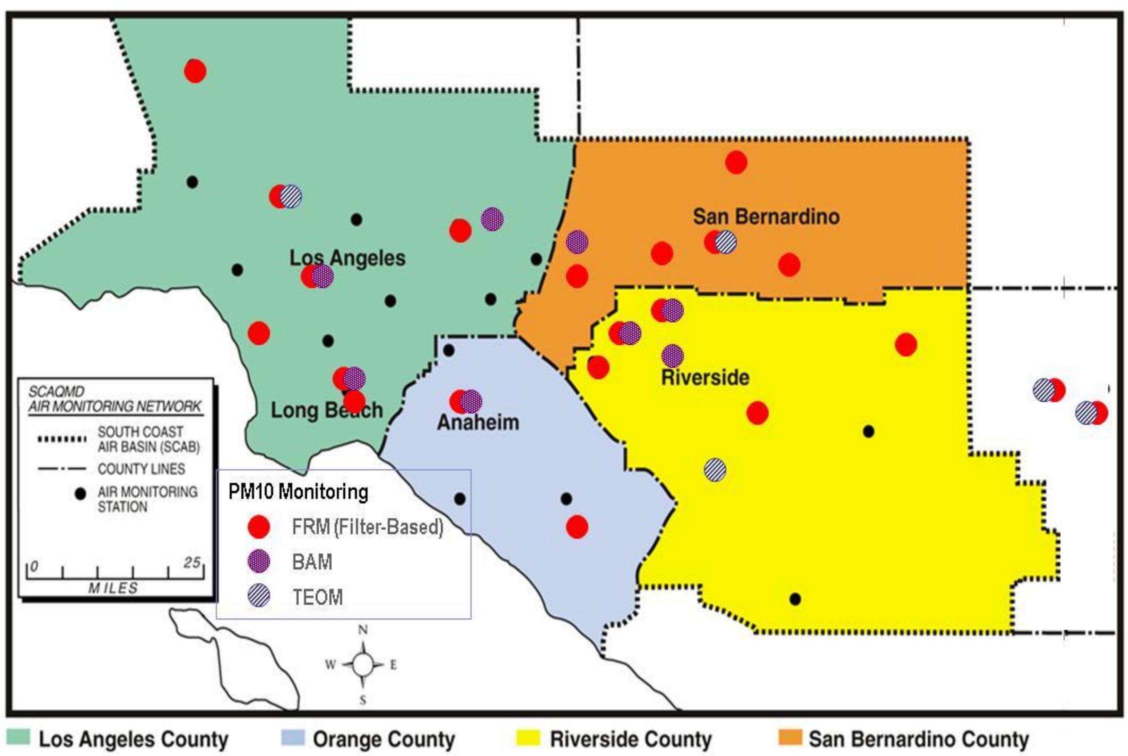


FIGURE 2-9
South Coast Air Quality Management District PM10 Monitoring

PM2.5 Air Quality

The District began routine monitoring of PM2.5 regularly in 1999 and the number of PM2.5 monitoring stations has increased in recent years. In 2011, the District monitored PM2.5 concentrations at 25 routine sampling locations (including 2 in the Coachella Valley), 22 with Federal Reference Method (FRM) filter samplers and 7 with Federal Equivalent Method (FEM) continuous monitors (shown in Figure 2-8). Only one of FEM monitor is not collected with an FRM sampler. The FRM PM2.5 measurements, based on samplers with size-selective inlets using teflon filters, are collected for a 24-hour period every 3 days at most locations, except for seven stations that historically have higher concentrations where daily FRM samples are collected. One station in the Big Bear Lake area has a 24-hour sample collected every 6 days.

All PM2.5 data from sites in the District's network using FRM samplers are suitable for comparison to PM2.5 NAAQS for attainment purposes. The PM2.5 network also includes continuous FEM and non-FEM Beta Attenuation Monitors (BAM) throughout the District's jurisdiction. At the sites where both 24 hour FRM PM2.5 samplers and FEM PM2.5 continuous analyzers are deployed together, the 24 hour FRM PM2.5 sampler remains the primary analyzer used for attainment purposes. On many days, there is poor comparability of the FEM PM2.5 monitors and the FRM method. Therefore, the continuous hourly measurements that are available in real time are used primarily for forecasting and public notification of PM2.5 air pollution levels.

The highest 24-hour PM2.5 measurement recorded in 2011 in the Basin (94.6 $\mu g/m^3$ on July 5 at East San Gabriel Valley at Azusa) was flagged in the U.S. EPA Air Quality System (AQS) database for exclusion under the U.S. EPA Exceptional Event Rule, due to Independence Day fireworks displays. With this data included, the 2009-2011 24-hour design value for Azusa would exceed the federal standard level in 2011 and the 3-year design value. With that exceptional event flagged (pending further documentation and U.S. EPA concurrence), the only station with a 24-hour design value exceeding the 24-hour federal standard is in Metropolitan Riverside County (Mira Loma). The daily FRM sampler at Mira Loma exceeded the 24-hour federal standard on 8 days in 2011. The annual and 24-hour design values for the former Basin maximum station in Metropolitan Riverside County (Riverside-Rubidoux) are currently below the federal standards, based on the 2009-2011 data.

The federal 24-hour PM2.5 standard concentration level was exceeded at 75 percent of the locations monitored in the District in 2011. With the one exceptional event day flagged, the Basin's next-highest 24-hour average (65.0 $\mu g/m^3$) occurred in the Central

San Bernardino Valley (City of San Bernardino) and was 183 percent of the federal 24-hour PM2.5 standard. However, that location did not exceed the 98th percentile design value form of the standard in 2011, nor the 2009-2011 3-year design value.

In 2011, the federal annual average PM2.5 standard was exceeded at one location (Metropolitan Riverside at Mira Loma). The maximum annual average recorded there (15.3 $\mu g/m^3$) was 101 percent of the federal standard and 126 percent of the state standard. The maximum 24-hour and annual average PM2.5 concentrations in 2011 are summarized by county in Tables 2-2 and 2-3, respectively, along with comparisons to the federal and state standards. Tables A-9 to A-12 in the Attachment to this appendix show the annual arithmetic mean, percentage of sampling days over the 24-hour federal standard, maximum 24-hour average concentrations, and 98th percentile 24-hour concentrations for the years 1999-2011 at all monitoring stations.

TABLE 2-2

2011 Maximum 24-hour Average PM2.5 Concentrations by Basin and County

Basin/County	Maximum 24-Hr Average# ($\mu g/m^3$)	Percent of Federal Standard* (35 $\mu g/m^3$)	Area
South Coast Air Basin			
Los Angeles**	49.5	139	East San Gabriel Valley
Orange	39.2	110	Central Orange County
Riverside	60.8	171	Metropolitan Riverside County
San Bernardino	65.0	183	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside***	35.4	99.7	Coachella Valley

\# Based on FRM data

* Although maximum 24-hour concentrations exceed the standard, the 98th percentile form of the 2009-2011 design value only exceeded the standard at one station in Metropolitan Riverside County

** One higher concentration that was recorded due to "Independence Day" firework activities has been flagged for exclusion from NAAQS comparison in accordance with the U.S. EPA Exceptional Events Regulation; with this data included, the 2009-2011 design value for East San Gabriel Valley would also exceed the federal standard

*** While this concentration of 35.4 $\mu g/m^3$ is near the level of the standard, it is technically not exceeding the standard (35.5 $\mu g/m^3$ exceeds); this concentration was associated with a high wind exceptional event

TABLE 2-3

2011 Maximum Annual Average PM2.5 Concentrations by Basin and County

Basin/County	**Annual Average* (μg/m³)**	**Percent of Federal Standard (15 μg/m³)**	**Percent of State Standard (12 μg/m³)**	**Area**
South Coast Air Basin				
Los Angeles	13.2	87	109	Central Los Angeles
Orange	11.0	73	90	Central Orange County
Riverside	15.3	101	126	Metropolitan Riverside County
San Bernardino	13.2	87	109	Southwest San Bernardino Valley
Salton Sea Air Basin				
Riverside	7.2	48	60	Coachella Valley

*   Based on FRM data

PM2.5 Spatial Variation

Figure 2-10 shows the 2011 annual average arithmetic mean PM2.5 concentrations mapped throughout the Basin. Like PM10, PM2.5 annual concentrations were higher in the inland valley areas of Metropolitan Riverside County. Figure 2-11 shows the 2011 24-hour PM2.5 concentrations, using the 98th percentile form of the standard, mapped throughout the Basin. As is seen with the annual average, the 98th percentile concentration only exceeds the 24-hour federal standard in the Metropolitan Riverside County area (Mira Loma). A larger area is just below the NAAQS, with concentrations in the 30 to 35 μg/m^3 range, from the eastern San Fernando Valley and Central Los Angeles in the western Basin through the urban areas of Riverside and San Bernardino.

The higher PM2.5 concentrations in the Basin are mainly due to the secondary formation of smaller particulates resulting from mobile, stationary and area source emissions of gases (NOx, SOx, NH_4, VOC) that are converted to particulate matter in the atmosphere. In contrast to PM10, PM2.5 concentrations were low in the Coachella Valley area of SSAB. While PM10 concentrations are normally higher in the desert areas due to windblown and fugitive dust emissions, PM2.5 is relatively low in the desert due to fewer combustion-related emissions sources.

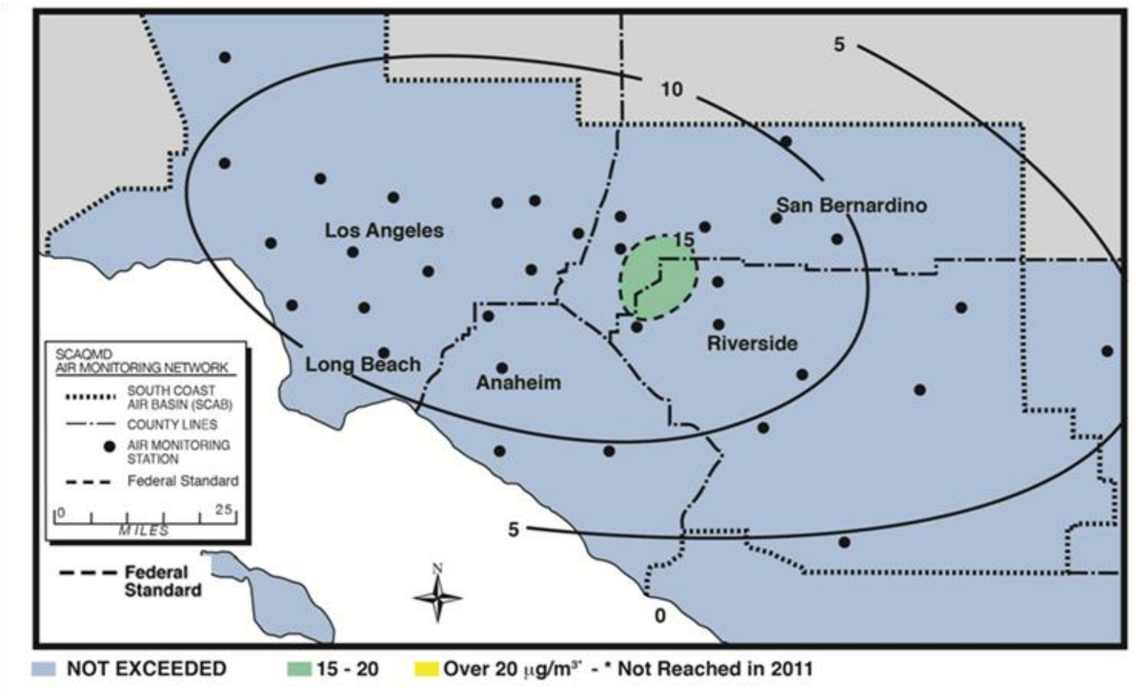


FIGURE 2-10
Annual Average PM2.5 (µg/m^3) in 2011
(Annual PM2.5 NAAQS = 15 µg/m^3, annual arithmetic mean)

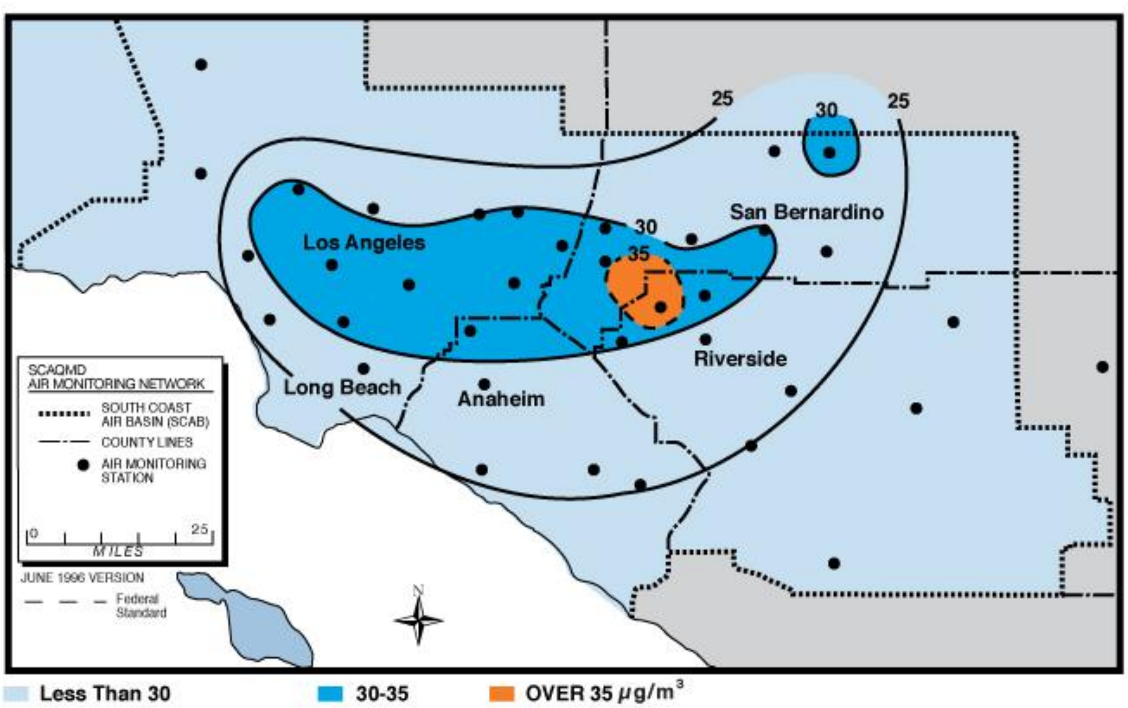


FIGURE 2-11
98th Percentile 24-Hour Average PM2.5 (µg/m^3) in 2011
(24-hour PM2.5 NAAQS = 35 µg/m^3)

PM2.5 Trends

Figure 2-12 shows the Basin 3-year design values (plotted by end year) for the current 24-hour and annual PM2.5 standards, for the period from 2001 through 2011. This illustrates the significant progress toward attainment of the standards in the last ten years.

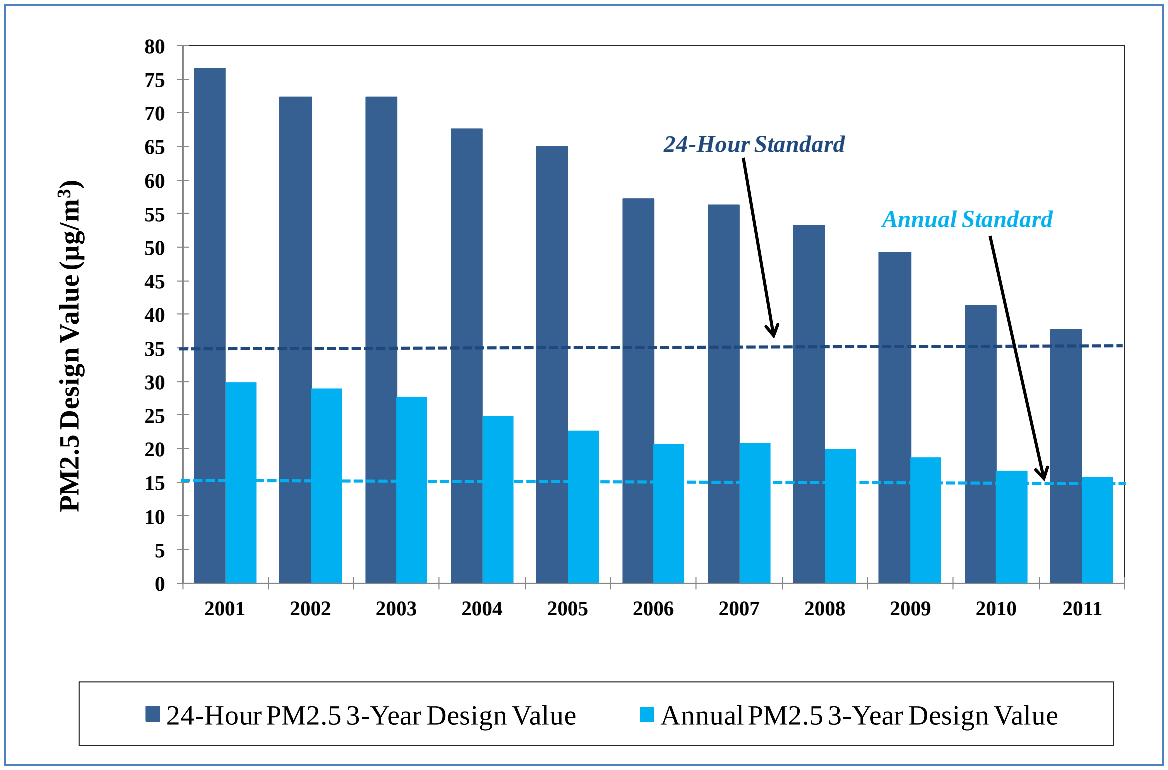


FIGURE 2-12

South Coast Air Basin PM2.5 Design Value Trends, 2001-2011

PM2.5 Temporal Variation

Seasonal and day-of-week variations in PM2.5 concentrations are complex and location dependant, and may vary from year to year depending on meteorological conditions, the presence of large wildfires, and other factors. Previous analyses showed that the highest PM2.5 concentrations tend to occur in the fall, of most years. That held true in 2011. Figure 2-13 shows the Basin-wide monthly averaged PM2.5 concentrations, by month for the year 2011. In that year, the monthly PM2.5 averages were highest in October, followed closely by December. The somewhat lower multi-station averages in November 2011 likely resulted from an above-normal number of offshore wind days in that month that generally provided good dispersion and brought cleaner air from the deserts into the Basin.

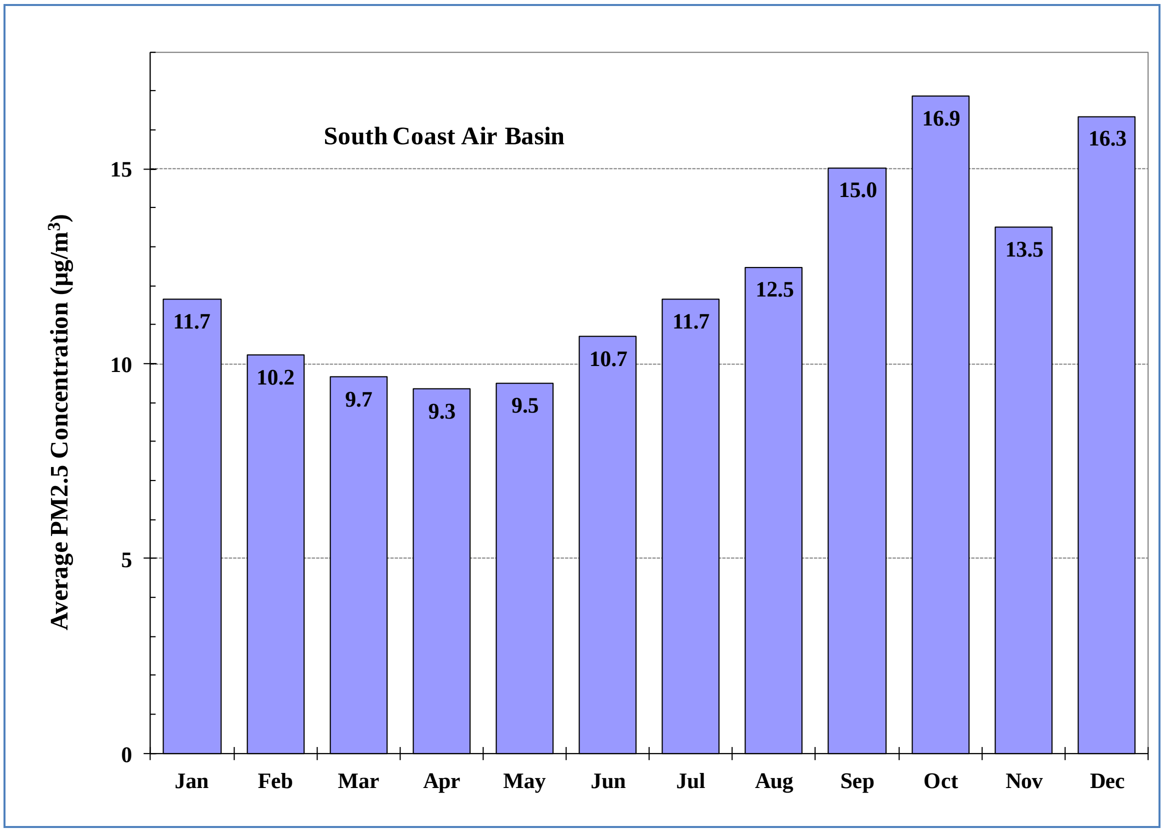


FIGURE 2-13

2011 PM2.5 Variation of Basin-wide FRM Monthly Average Concentration

Figure 2-14 shows an analysis of day-of-week variation in Basin-wide PM2.5 daily concentrations averaged for the three most recent years (2009-2011). This shows that Fridays have slightly higher average PM2.5, possibly due to increased traffic and/or build up of pollution over multiple week-days. Saturdays and Thursdays follow, but the average difference from the lowest day (Monday) to the highest (Friday) is only 3.2 $\mu g/m^3$.

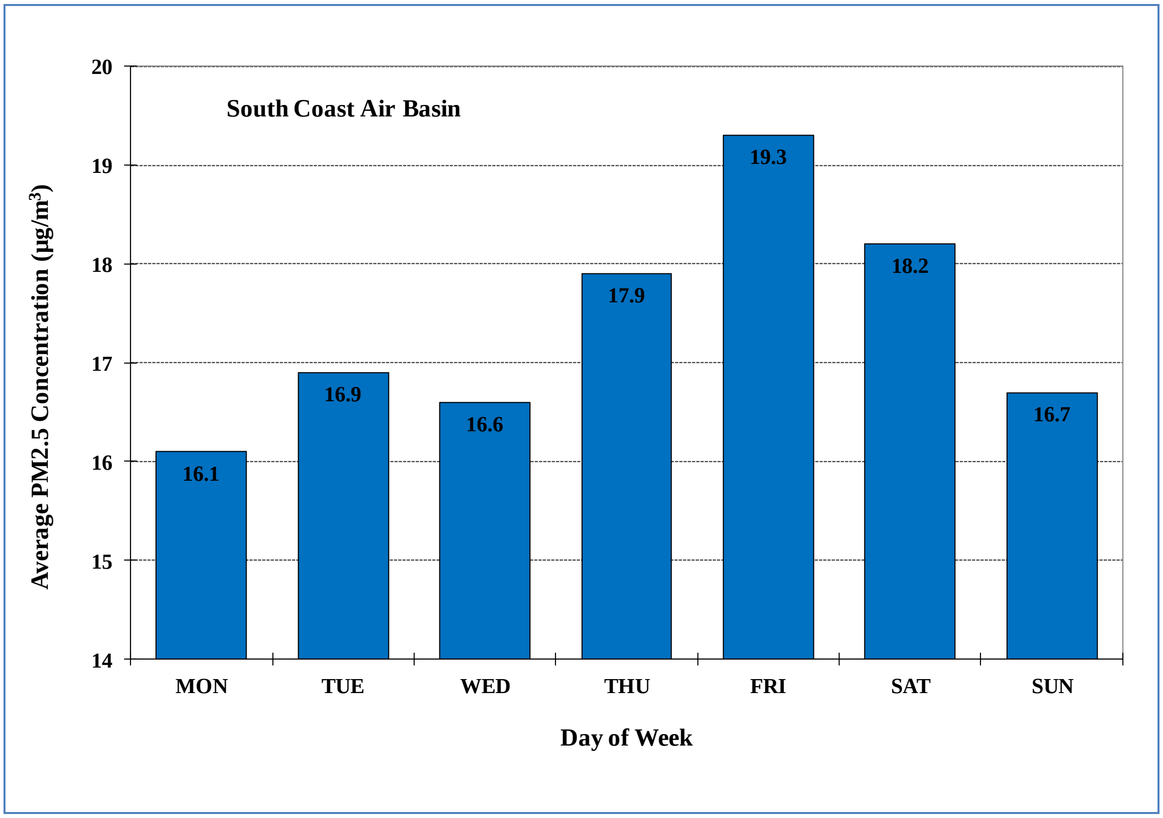


FIGURE 2-14

PM2.5 Basin-wide Day-of-Week Variation of 24-hour Average FRM PM2.5 Concentrations, 2009-2011

Figure 2-15 shows average PM2.5 concentration by hour of the day for the period 2009-2011, based on the hourly BAM sampler data. The diurnal plots are for the Basin maximum PM2.5 monitor (Metropolitan Riverside at Mira Loma), Central Los Angeles (Downtown), Central Orange County (Anaheim), and the average of several sites throughout the Basin. In general, PM2.5 concentrations peak around 8 a.m. (Pacific Standard Time), with the morning traffic. They decrease in the early afternoon, then peak in the evening due to secondary aerosol formation following evening traffic, and late at night when the lower nighttime temperature inversion traps the pollutants in a shallower layer near the surface.

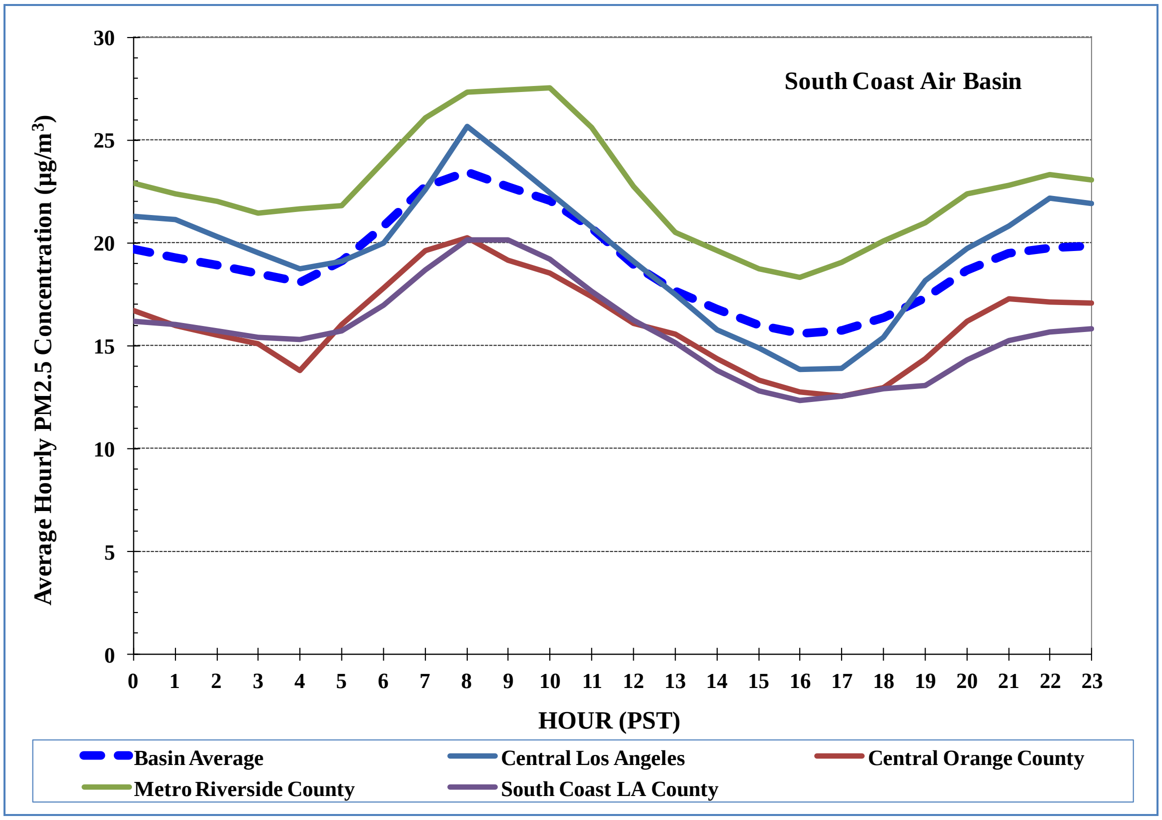


FIGURE 2-15

Diurnal Variation of Hourly FEM PM2.5, Averaged by Time of Day (2009-2011)

PM2.5 Speciation

PM2.5 speciation sampling to determine the chemical components of PM2.5 is also a part of the District's PM2.5 measurement program. Currently, PM2.5 speciation samplers are deployed at four representative locations in each of the Basin's counties (Anaheim, Fontana, Los Angeles and Rubidoux). Analysis of the filters from the ambient network Speciation Air Sampling System (SASS) samplers are conducted at the District's laboratory. Figure 2-16 shows the trends of the annual concentration of six PM2.5 component species: Elemental Carbon (EC), Organic Carbon (Organics), Sulfate (SO_4), Nitrate (NO_3), Ammonium (NH_4), and Crustal Elements (soils). Most of the components show a downward trend in recent years. Figure 2-17 shows the composition from the speciation sampler at the Riverside-Rubidoux station, comparing the 2010 annual average to the 2010 peak 24-hour average sampled at this location. This is the closest PM2.5 speciation station to the Basin maximum PM2.5 station (Riverside-Mira Loma) and it was the Basin maximum location before monitoring began at Mira Loma. On the high day, the nitrate becomes a larger fraction of the mass compared to the annual average, indicating the importance of secondary atmospheric processes to the PM2.5 composition in Riverside County.

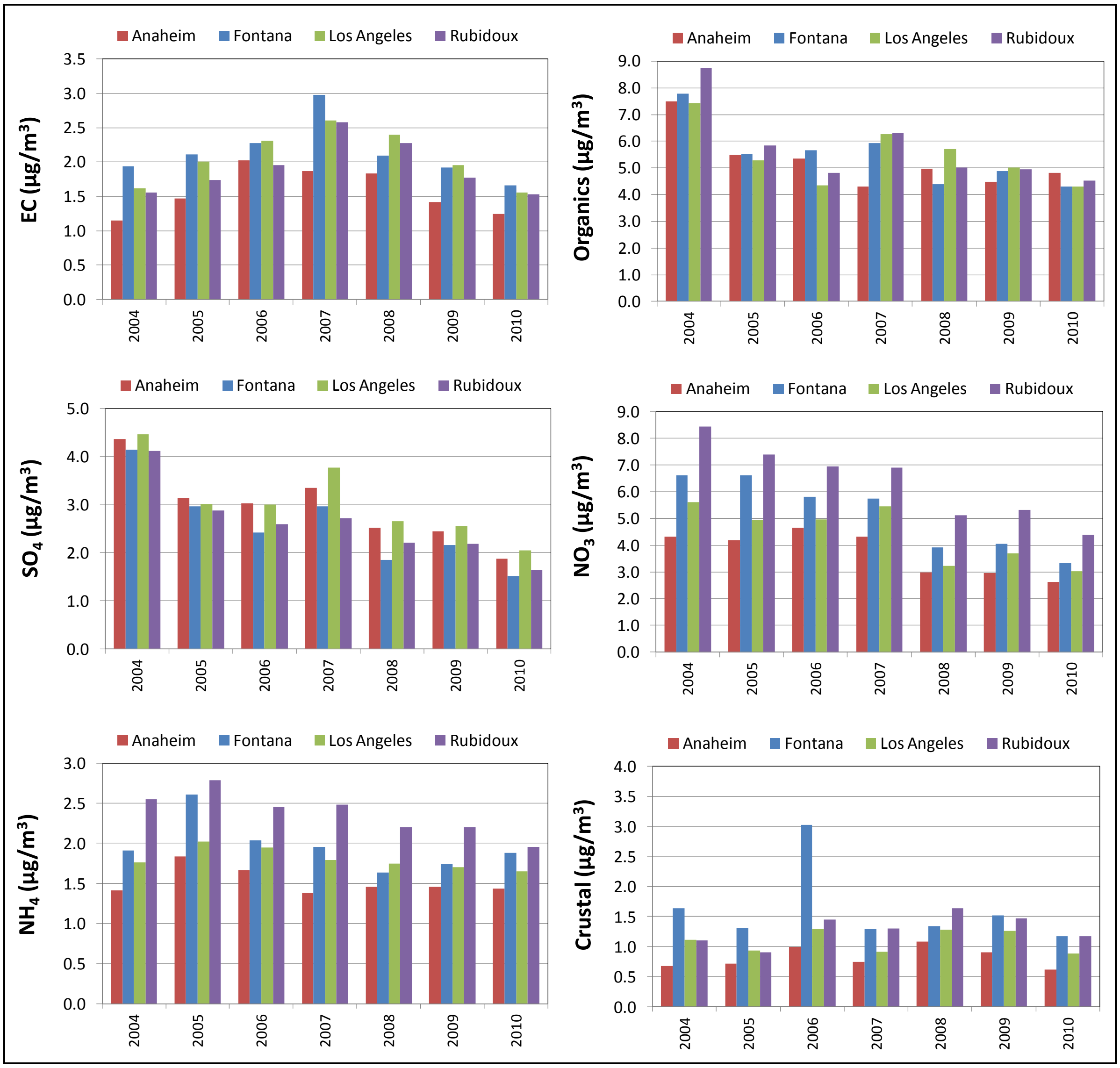


FIGURE 2-16

South Coast Air Basin PM2.5 SASS Speciation Network Annual Trends 2004-2010
Annual Averaged PM2.5 Elemental Carbon (EC), Organics, Sulfate (SO_4), Nitrate (NO_3), Ammonia (NH_4), and Crustal Component Concentrations, for Anaheim, Fontana, Los Angeles, and Rubidoux Stations

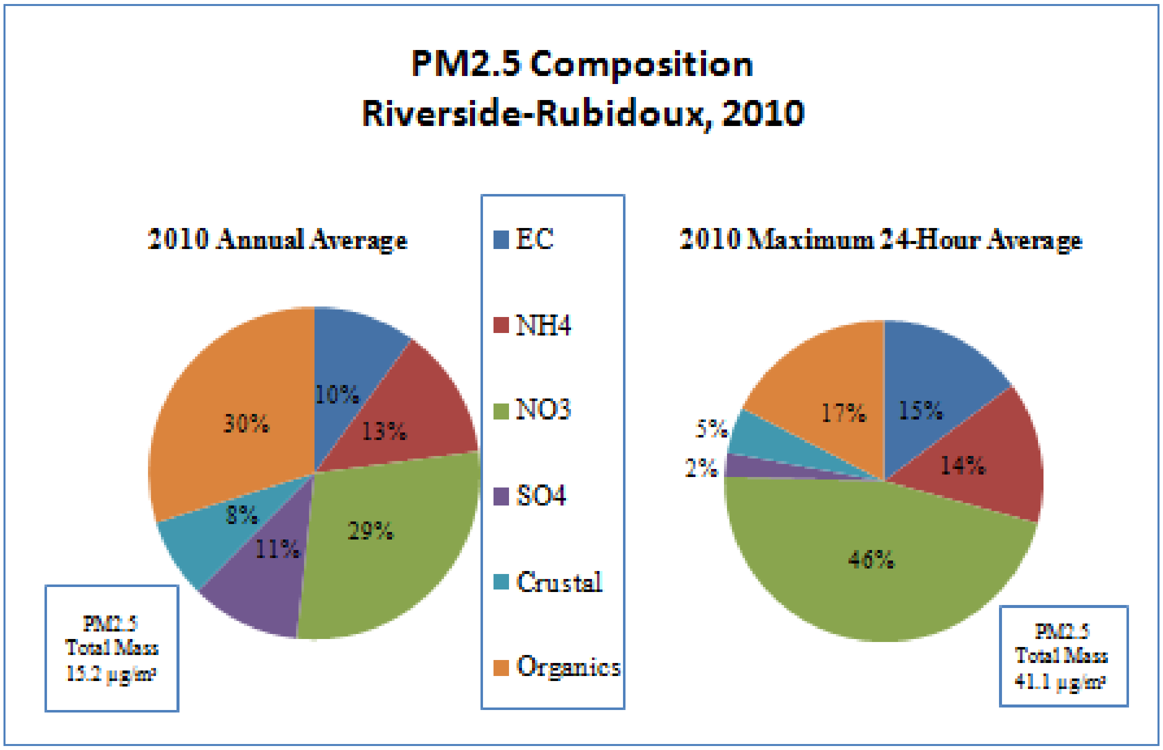


FIGURE 2-17
2010 PM2.5 Speciation for Annual Average and Highest Day
(Riverside-Rubidoux SASS Speciation Sampler)

PM10 Air Quality

In 2011, the District measured PM10 concentrations at 23 locations throughout the Basin and two locations in the Salton Sea Air Basin (Coachella Valley), as shown in Figure 2-9. Size-selective inlet (SSI) manual high volume FRM samplers are operated at 19 sites in the Basin and two sites in the Coachella Valley to meet the requirements for PM10 Federal Reference Method (FRM) sampling. All of these FRM monitors operate on a one-in-six-day schedule, with the exception of two that operate on a one-in-three-day schedule (Riverside-Rubidoux in the Basin and Indio in the Coachella Valley).

PM10 continuous analyzers, including Beta Attenuation Monitor (BAM) and Tapered Element Oscillating Microbalance (TEOM), are operated at 13 sampling sites, including four that are not collocated with FRM samplers. Real-time monitors, for the most part, are clustered in the higher concentration areas. At locations where both FRM samplers and PM10 continuous analyzers are deployed together, the data is generally combined for attainment purposes, with the FRM data considered the primary data source.

The highest annual PM10 concentrations were recorded in and around the metropolitan Riverside County area and further inland in the San Bernardino Valley areas. The federal 24-hour standard (150 µg/m^3) was not exceeded at any of the locations monitored in 2011, although Riverside County came close with a 24-hour concentration of 152 µg/m^3 (98 percent of the federal 24-hour standard; the concentration must reach 155 µg/m^3 to exceed the NAAQS). The revoked annual average PM10 federal standard (50 µg/m^3) was also not exceeded in the Basin in 2011.

The more stringent state annual (20 µg/m^3) and 24-hour (50 µg/m^3) PM10 standards were exceeded in more than two-thirds of the areas monitored. The state 24-hour standard was also exceeded most frequently in the Basin's inland valleys, centered on Metropolitan Riverside County. Maximum 24-hour and annual average PM10 concentrations in 2011 are shown in Tables 2-4 and 2-5. For each routine District ambient air monitoring station, the annual arithmetic mean, percent of sampling days exceeding state and federal standards, and maximum 24-hour average concentrations are shown in Tables A-6 to A-8 in the Attachment for the years 1995-2011. Please refer to Appendix II from the 2003 AQMP for the 1976-1989 prior-year statistics and to Appendix II from the 2007 AQMP for 1990-2005 data.

TABLE 2-4

2011 Maximum 24-hour Average PM10 Concentrations by Basin and County

Basin/County	Maximum 24-Hr Average* (µg/m^3)	Percent of Federal Standard (150 µg/m^3)#	Percent of State Standard (50 µg/m^3)	Area
South Coast Air Basin				
Los Angeles	119	77	233	Central Los Angeles
Orange	79	51	155	Central Orange County
Riverside	152	98	298	Metropolitan Riverside County
San Bernardino	127	82	249	Central San Bernardino Valley
Salton Sea Air Basin**				
Riverside	120	77	235	Coachella Valley

* Based on the FRM and FEM data

** Higher concentrations were recorded for high wind events in the Coachella Valley which have been flagged for exclusion from NAAQS comparison in accordance with the U.S. EPA Exceptional Events Rule

A level of 155 µg/m^3 is needed to exceed the federal standard, thus percentages are based on 155 µg/m^3

TABLE 2-5

2011 Maximum Annual Average PM10 Concentrations by Basin and County

Basin/County	Annual Average* (µg/m³)	Percent of Federal Standard** (50 µg/m³)	Percent of State Standard (20 µg/m³)	Area
South Coast Air Basin				
Los Angeles	32.7	64	163	East San Gabriel Valley
Orange	24.9	49	124	Central Orange County
Riverside	41.4	81	206	Metropolitan Riverside County
San Bernardino	31.8	62	158	Central San Bernardino Valley
Salton Sea Air Basin				
Riverside	32.6	64	162	Coachella Valley

* Based on the FRM and FEM data

** The federal annual PM10 standard was revoked in 2006

PM10 Spatial Variation

Figure 2-18 shows the contour map of the annual average (arithmetic mean) PM10 concentrations distribution in the Basin in 2011. The areas with the highest annual average PM10 concentrations were located in the Metropolitan Riverside County area. The maximum annual average recorded (41.4 µg/m³) was 81 percent of the former federal annual PM10 standard.

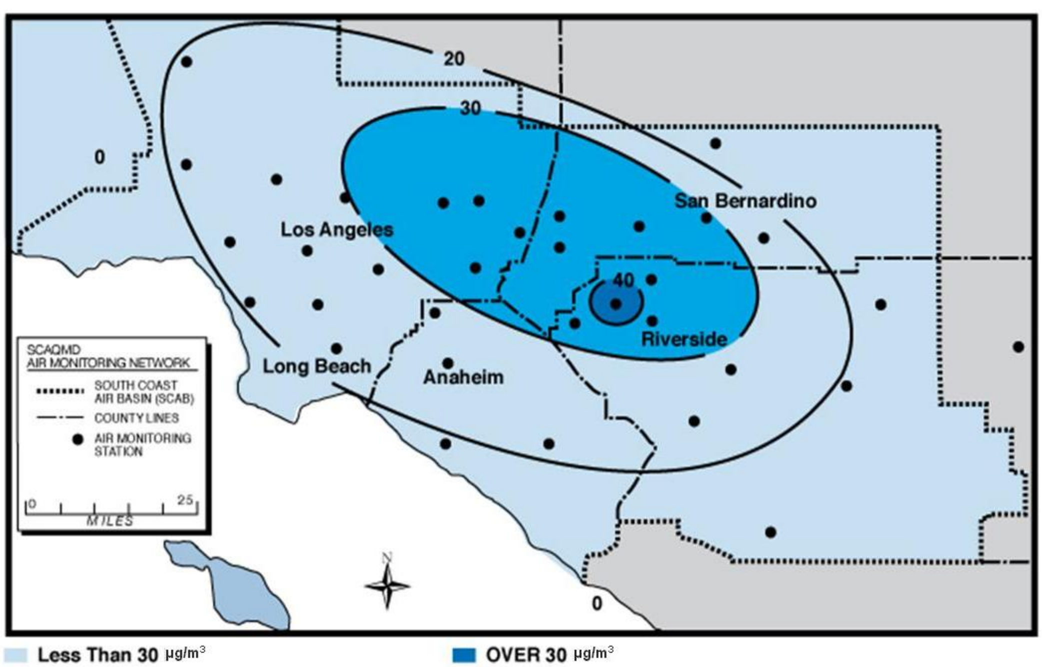


FIGURE 2-18

Annual Arithmetic Mean PM10 Particulate Matter (µg/m³) in 2011

PM10 Trends

Figure 2-19 shows the trend for the period between 2000 and 2011 of the design value form of the 24-hour federal PM10 standards for the Basin (i.e., the fourth highest 24-hour average PM10 concentration in three years). It also shows the trend for the design value form of the revoked annual federal PM10 standard, that is, the 3-year average of the annual arithmetic mean concentrations. Since 2005, the Basin has remained below the design value form of the federal PM10 standard (150 μg/m^3). The District has petitioned U.S. EPA to consider redesignation of the Basin to attainment for the PM10 standard. The most recent year, 2011, was also remained below the revoked federal annual PM10 standard (50 μg/m^3).

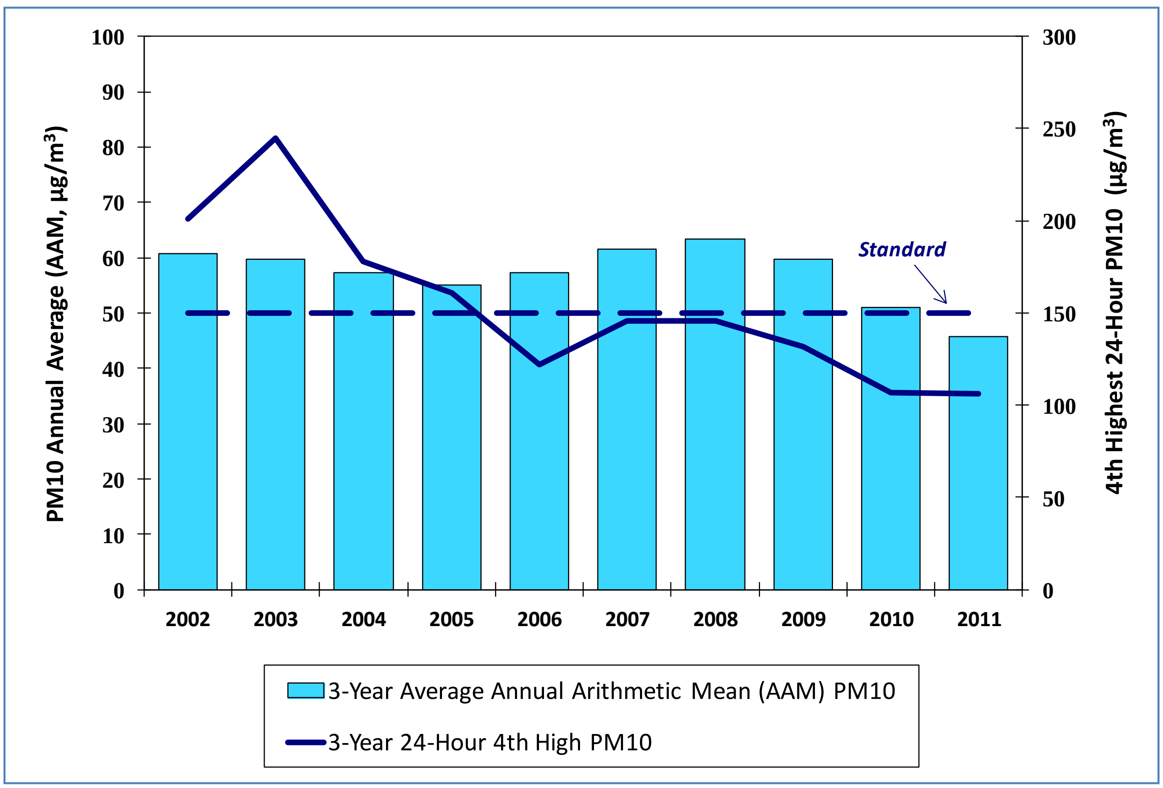


FIGURE 2-19

PM10 Particulate Matter Design Value Trend
(2000 through 2011 data, 3-Year Average of Annual Arithmetic Mean and 4th Highest 24-Hour PM10 Concentration in 3 Years, μg/m^3)

PM10 Temporal Variation

Exceedances of the 24-hour PM10 federal standard in the Basin have become rare in recent years. In fact, the only exceedances in the Basin for several years have been associated with exceptional events, such as high wind natural events or cultural events (Independence Day fireworks). As a consequence, variations in exceedances of the state standard are considered here for the seasonal and day-of-week patterns in the Basin, using the FRM and FEM PM10 measurements combined.

Previous analyses of seasonal variations in PM10 show that the monthly average PM10 concentrations and the monthly average number of days exceeding the state standard tend to peak in summer and fall in the inland valley area of the Basin where PM10 concentrations are highest. However, in the South Coastal Los Angeles County area (Long Beach), monthly average PM10 concentrations and the average number of days exceeding the state standard were highest in the late fall and winter months.

Figure 2-20 shows the number of days in each month exceeding the state standard at one or more Basin locations over the period 2009-2011. Overall, the greatest number of exceedances of the state standard occurred in the summer months. Due to the higher number of exceedances in the inland valleys, the pattern for the Basin is more similar to those for individual sites in the inland valley areas. Figure 2-21 shows the monthly exceedances for stations in two areas, Metropolitan Riverside County (Riverside-Rubidoux) and South Coastal Los Angeles County (Long Beach). As was found in the previous analyses, the number of days exceeding state standards are more frequent in the summer and fall months in the inland valley areas, but higher in the late fall and winter months in the coastal areas. Most of the coastal high values occur at that time due to windblown dust from the strong, offshore Santa Ana winds that occur in the fall and winter.

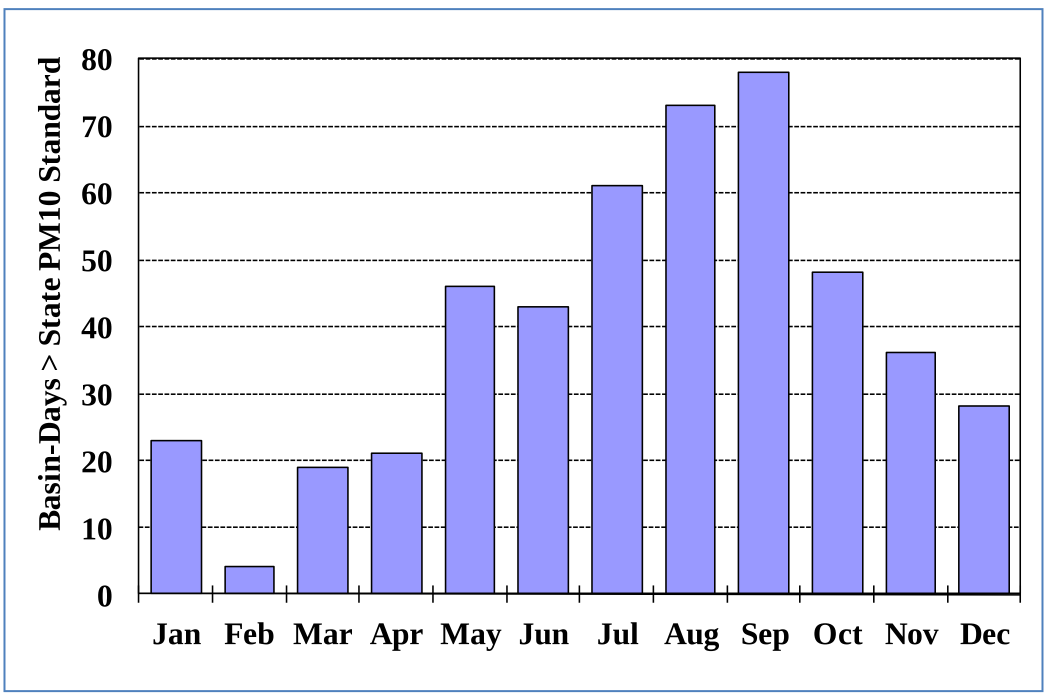


FIGURE 2-20

Basin-Days Exceeding the State PM10 Standard (50 µg/m^3) by Month, 2009-2011

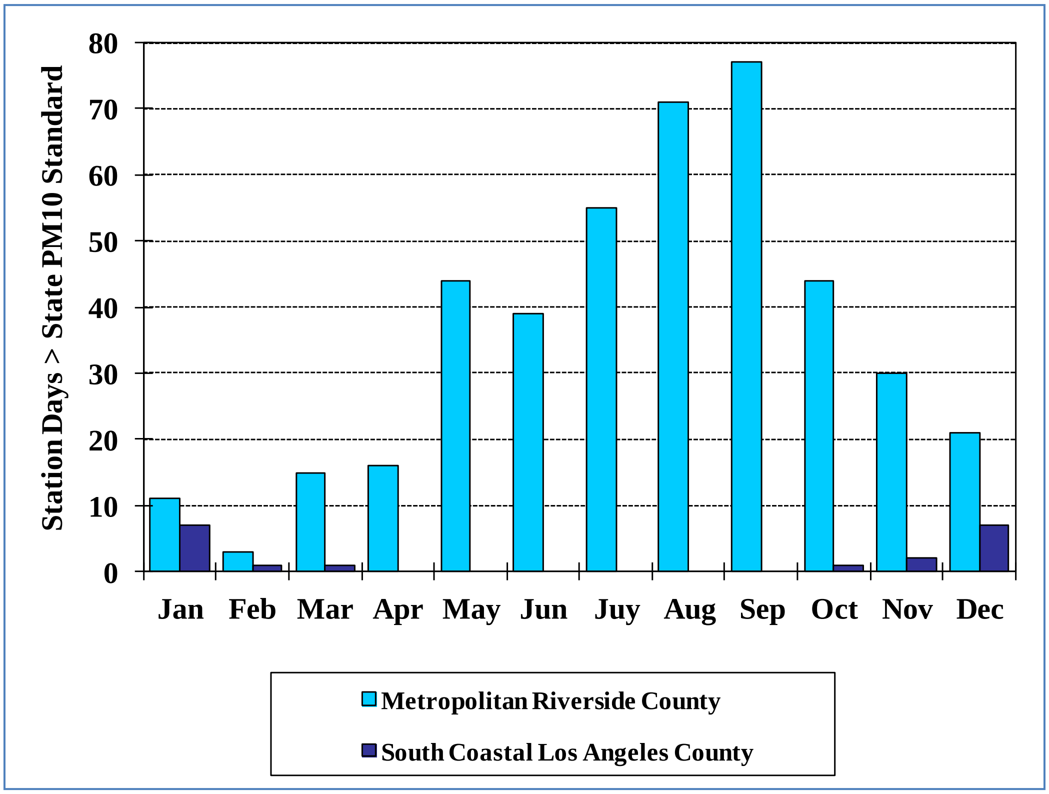


FIGURE 2-21

Number of Station Days Exceeding State PM10 Standard (50 µg/m^3) by Month, 2009-2011

Figure 2-22 shows the total number of days exceeding the state standard by day of week in the Basin and at selected sites in each county, for the period 2009-2011. The highest numbers of PM10 state standard exceedances occur on Thursday and Friday, possibly due to vehicle traffic, especially truck traffic, on those days and more construction activities than the weekend. Stations in the western Basin showed significant improvement on the weekends. On Sundays, the number of exceedances was lowest across the Basin, on average.

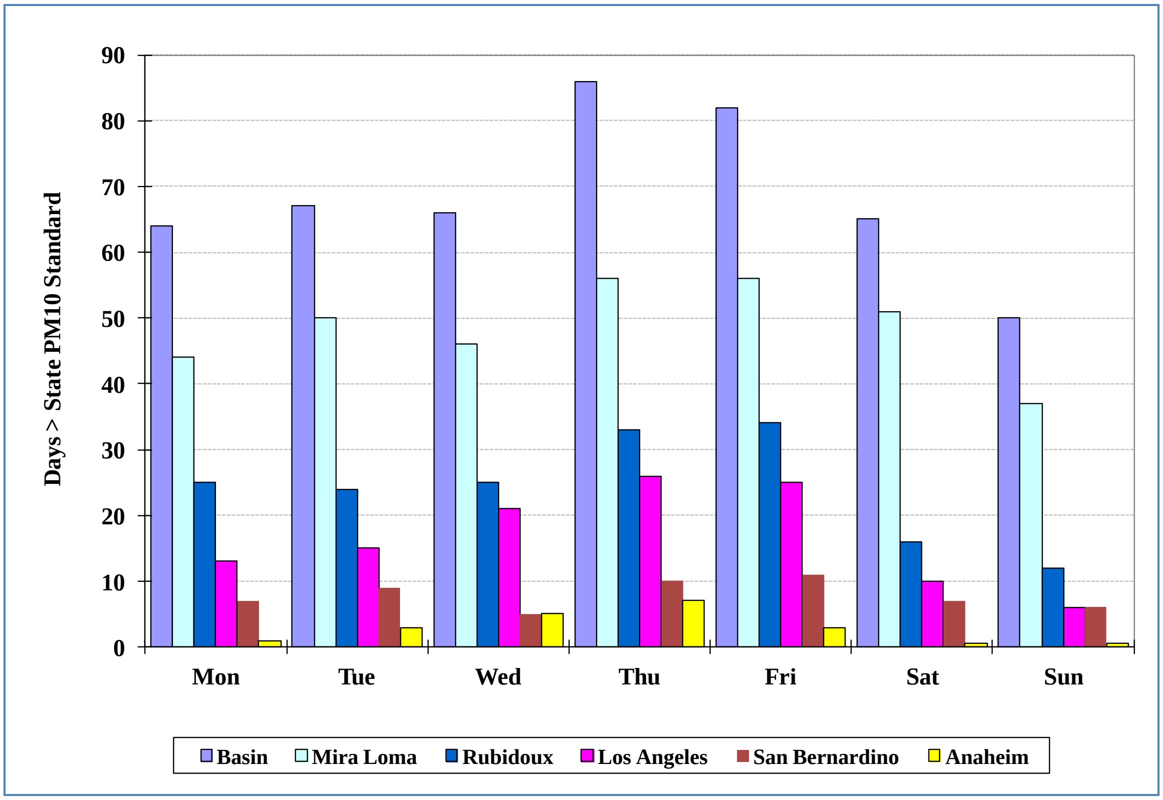


FIGURE 2-22

PM10 Day-of-Week Variation, 2009-2011
(Number of Days Exceeding the State Standard (50 µg/m^3) by Day of Week,
for Basin and Individual Stations)

Figure 2-23 shows average PM10 concentrations for each hour of the day for the period 2009-2011 for the entire Basin and for select monitoring stations in the Basin, based on the hourly BAM and TEOM data. On average, PM10 concentrations show a peak near 0900 to 1100 PST in the morning, just after the heaviest morning traffic rush-hour traffic.

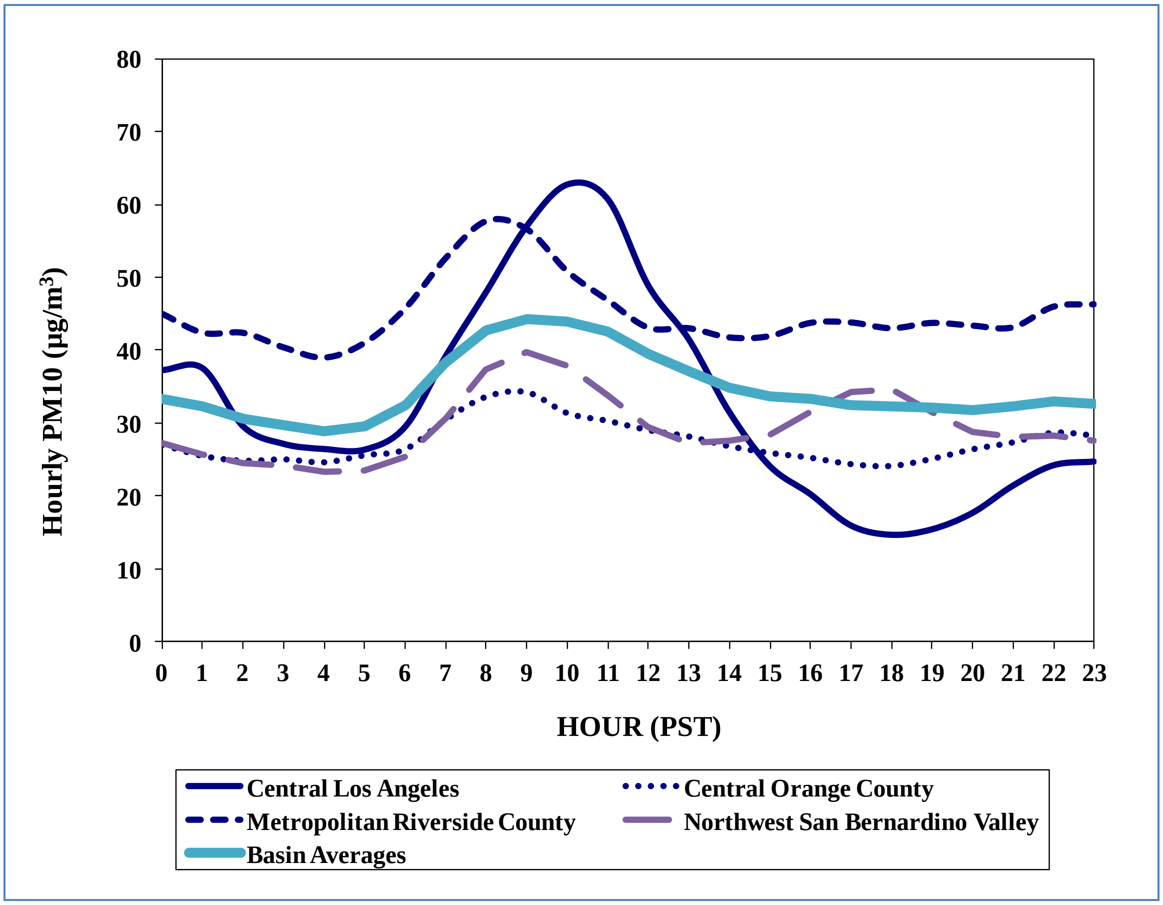


FIGURE 2-23
PM10 Diurnal Variation, 2011
(Annual Averaged FEM Hourly PM10 Concentrations, by Hour of the Day)

Ozone

<u>Current Ozone Air Quality</u>

In 2011, the District monitored ozone concentrations at 29 locations in the Basin and two in the Coachella Valley portion of the SSAB. All counties of the Basin and the Coachella Valley exceeded the current (2008) 8-hour ozone standard (0.075 ppm) in 2011. That standard was exceeded on 106 days, Basin-wide. All counties in the Basin, except Orange County, exceeded the 1997 8-hour ozone standard (0.08 ppm). The highest 8-hour average (0.136 ppm) in 2011 occurred in the Central San Bernardino

Mountains (Crestline) and was 180 percent of the 2008 8-hour ozone standard and 160 percent of the 1997 standard.

The revoked 1979 federal 1-hour ozone standard was exceeded on 16 days in the Basin, with all counties exceeding, except Orange County. The maximum 1-hour concentration (0.160 ppm) also occurred in the Central San Bernardino Mountains (Crestline) and was 128 percent of the 1979 1-hour standard.

The more stringent California state standards were exceeded almost everywhere in the Basin, except for a few coastal stations, with the greatest number of exceedances occurring in the Central San Bernardino Mountains (Crestline) and adjacent valleys. The California state 1-hour (0.09 ppm) and 8-hour (0.070 ppm) standards were exceeded on 90 days and 125 days, respectively. The highest 1-hour average and 8-hour average ozone concentrations recorded in 2011 (0.160 ppm and 0.136 ppm) were 176 percent and 192 percent of the state standards, respectively.

In 2011, all stations measured 1-hour ozone well below the Stage 1 episode level (0.20 ppm, 1-hour). Except for one day in 2003, the stage 1 episode level has not been exceeded in the Basin since 1998. There have been no exceedances of the Stage 2 episode level (1-hour average ozone $\geq$ 0.35 ppm) since 1988 and the Stage 3 episode level (1-hour average ozone $\geq$ to 0.50 ppm) has not been exceeded since 1974. The maximum concentrations measured in the Basin in 2011 exceeded the California 1-hour ozone Health Advisory level (0.15 ppm) at two stations on one day (July 2), with 1-hour concentrations of 0.160 ppm (Central San Bernardino Mountains – Crestline) and 0.151 ppm (East San Bernardino Valley - Redlands).

Tables 2-6 and 2-7 show the maximum 1-hour and 8-hour O_3 concentrations by air basin and county, along with the percentages over the federal and state standards. Tables A-2 through A-5 in the Attachment show the number of days exceeding the federal 8-hour and 1-hour ozone standards, as well as the 4^{th} high 8-hour average and maximum 1-hour concentrations, at all routine District air quality monitoring stations, for the period 1995-2011. Please refer to Appendix II from the 2003 AQMP for the 1976-1989 prior-year statistics and to Appendix II from the 2007 AQMP for 1990-2005 data.

TABLE 2-6

2011 Maximum 1-Hour Average Ozone Concentrations by Basin and County

Basin/County	Maximum 1-Hr Average (ppm)	Percent of Federal Standard (0.12 ppm)	Percent of State Standard (0.09 ppm)	Area
South Coast Air Basin				
Los Angeles	0.144	115	158	Santa Clarita Valley
Orange	0.095	76	104	North Orange County
Riverside	0.133	106	146	Lake Elsinore
San Bernardino	0.160	128	176	Central San Bernardino Mountains
Salton Sea Air Basin				
Riverside	0.124	99	136	Coachella Valley

TABLE 2-7

2011 Maximum 8-Hour Average Ozone Concentrations by Basin and County

Basin/County	Maximum 8-Hr Average (ppm)	Percent of Federal Standard (0.075 ppm)	Percent of State Standard (0.07 ppm)	Area
South Coast Air Basin				
Los Angeles	0.122	162	172	Santa Clarita Valley
Orange	0.083	110	117	Saddleback Valley
Riverside	0.115	152	162	Metropolitan Riverside County
San Bernardino	0.136	180	192	Central San Bernardino Mountains
Salton Sea Air Basin				
Riverside	0.098	130	138	Coachella Valley

Ozone Spatial Variation

The number of days exceeding federal standards for ozone in the Basin varies widely by area. Figures 2-24 and 2-25 map the number of days in 2011 exceeding the current 8-hour and former 1-hour ozone federal standards in different areas of the Basin in 2011. The former 1-hour federal standard was not exceeded in areas along or near the coast in the Counties of Los Angeles and Orange, due in large part to the prevailing sea breeze which transports emissions inland before high ozone concentrations can be reached. The standard was exceeded most frequently in the Central San Bernardino Mountains. Ozone exceedances also extended through San Bernardino and Riverside County valleys in the eastern Basin, as well as the northeast and northwest portions of Los Angeles

County in the foothill and valley areas. The number of exceedances of the 8-hour federal ozone standard was also lowest at the coastal areas, increasing towards the Riverside and San Bernardino valleys and the adjacent mountain areas. The Central San Bernardino Mountains area recorded the greatest number of exceedances of the 1-hour and 8-hour federal standards (8 days and 84 days, respectively) and 8-hour state standard (103 days). While the Coachella Valley did not exceed the former 1-hour ozone standard in 2011, the current 8-hour federal standard was exceeded on 54 days.

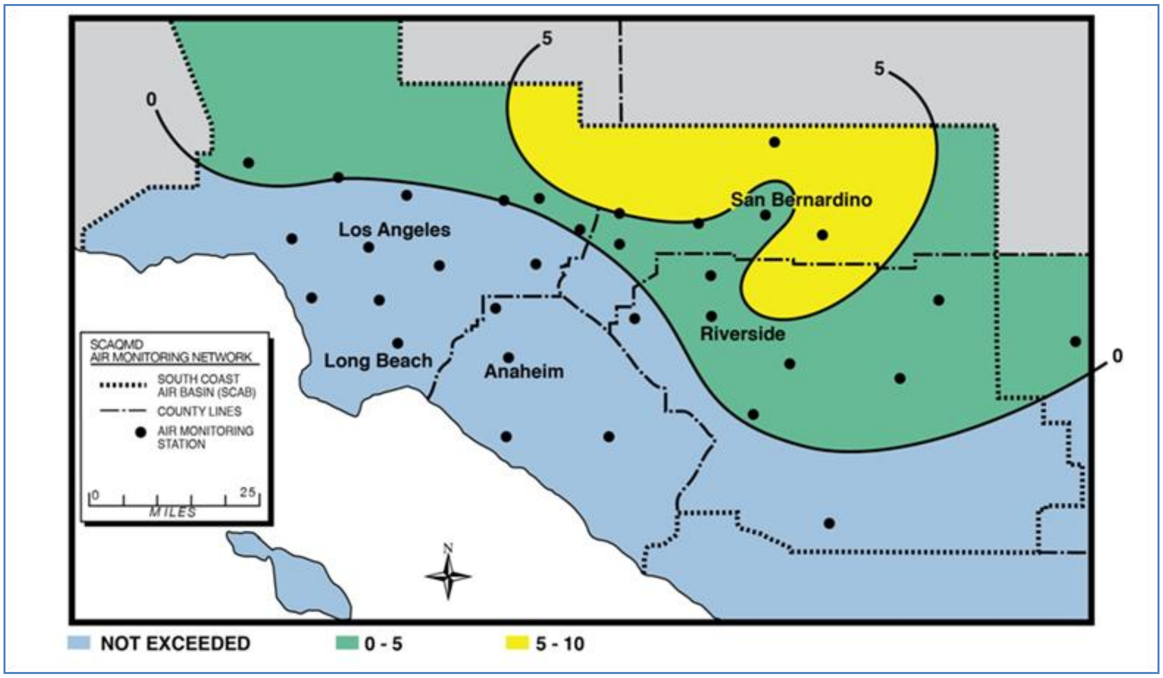


FIGURE 2-24
Number of Days in 2011 Exceeding the 1979 1-Hour Ozone Federal Standard
(1-hour average Ozone standard > 0.12 ppm)

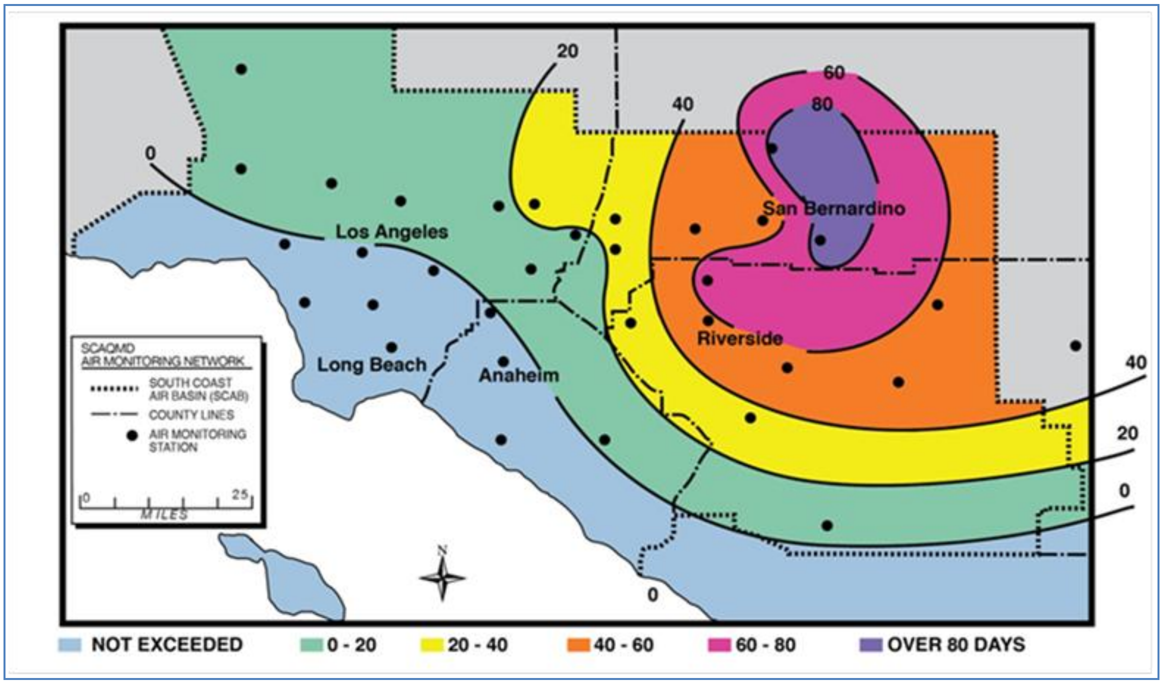


FIGURE 2-25

Number of Days in 2011 Exceeding the Current (2008) Federal 8-Hour Ozone Standard
(8-hour average Ozone standard > 0.075 ppm)

Ozone Trends

The rate of ozone air quality improvement has been dramatic since the concerted effort to manage air quality in the Basin began in the 1970s. Significant improvements were seen throughout the 1990s. While the rate of improvement in ozone has slowed somewhat in the past decade, the overall trend, as well as the expectation for the future, is continuing gradual improvement. Figure 2-26 shows the Basin-wide trend (1990-2011) of number of days exceeding the 2008 and 1997 8-hour ozone standards and the former (1979) 1-hour ozone standard, along with the trend of Basin maximum 8-hour averaged ozone concentrations. Figure 2-27 shows the trend (1990-2011) of the 8-hour and 1-hour ozone 3-year design values for the Basin.

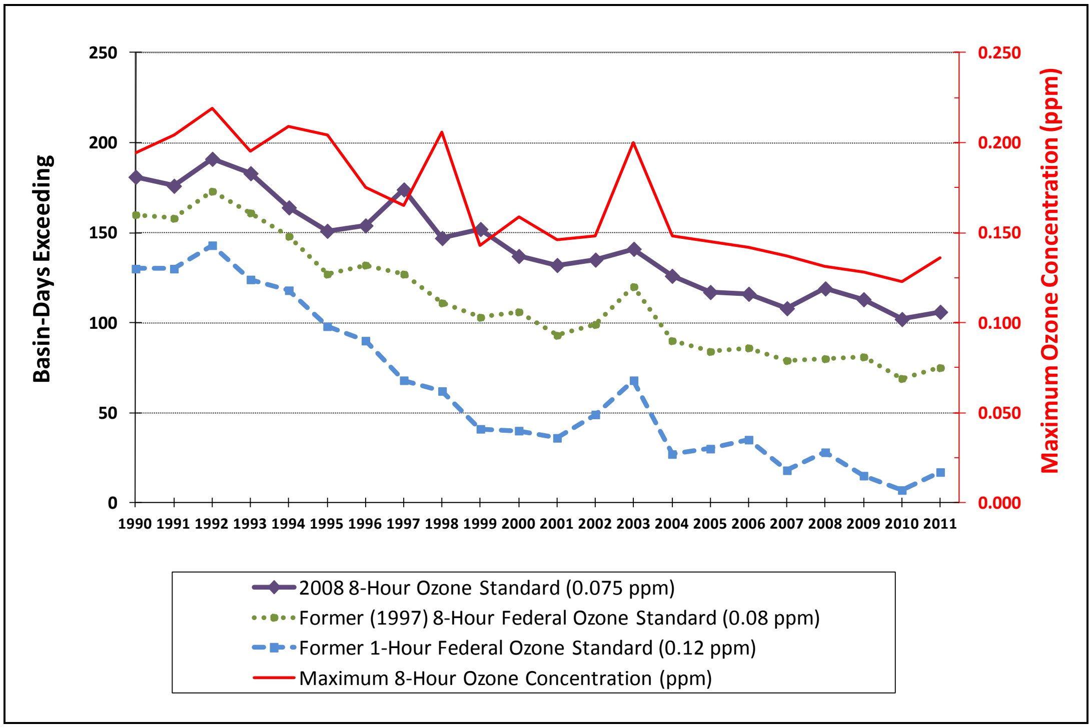


FIGURE 2-26

Trend of Annual Basin Days Exceeding Federal 8-Hour and 1-hour Ozone Standards (left axis) and Peak Concentrations (red line, right axis)
(South Coast Air Basin; by year, 1990-2011)

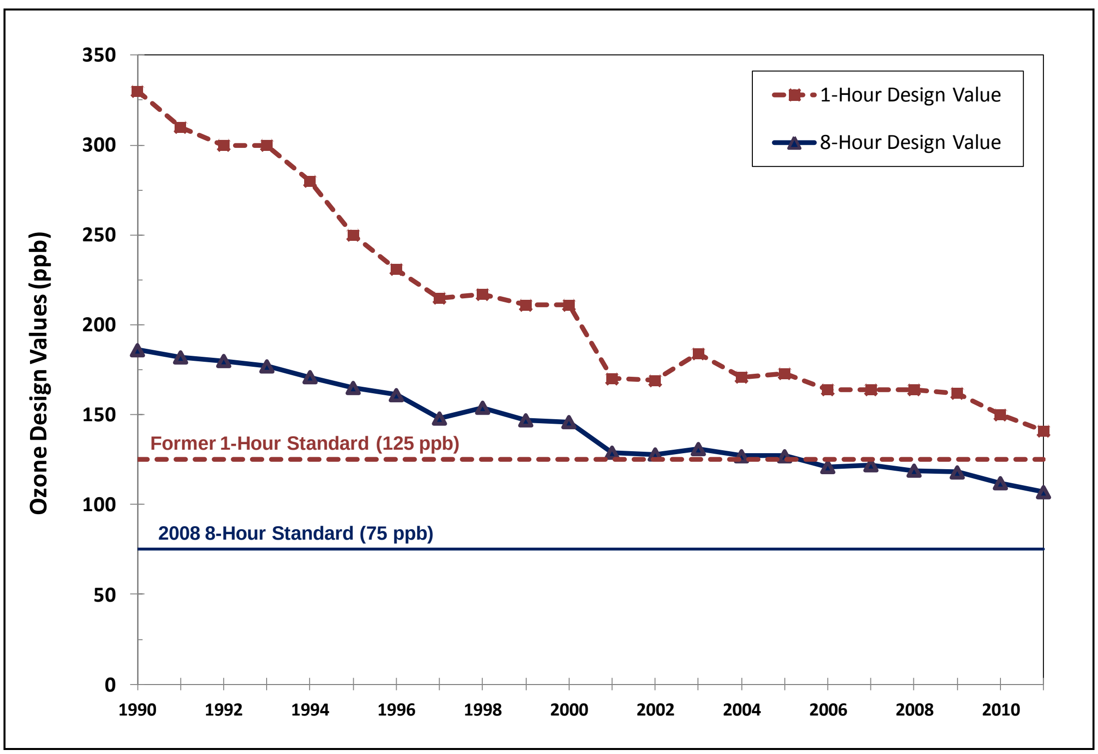


FIGURE 2-27

South Coast Air Basin Ozone Design Value Trends, 1990-2011
(1 ppb = 0.001 ppm)

Ozone Temporal Variation

Because photochemical reactions require sunlight to proceed, ozone formation is favored by strong solar radiation. Solar radiation is more intense and of longer duration in summer than in winter and summertime temperature inversions are stronger and more persistent. This causes ozone concentrations to be higher in summer than in winter. Peak ozone concentrations generally occur near the middle of the day during the period May through September.

Figure 2-28 shows the number of days per month that one or more monitoring stations exceeded the most recent (2008) federal 8-hour ozone standard level for the years 2000, 2005 and 2011. Most exceedances occur in July and August, with most days exceeding the federal standard in those months. Up until the late 1980's it was common to have days exceeding the federal ozone standard as early as February and as late as November. By the late 1990's there were no exceedances in the months of November through February. There have been relatively few exceedances in March or October in more recent years. The frequency of exceedances in the spring (April-June) has continued to decline in recent years.

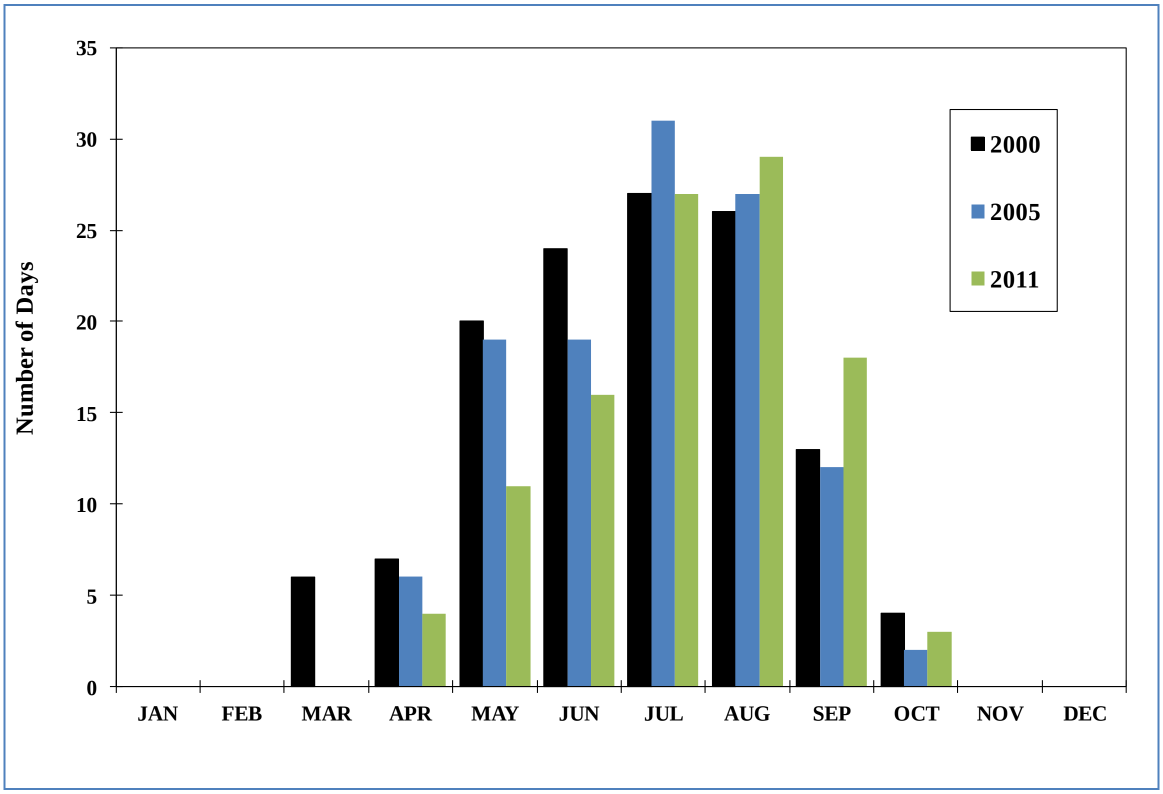


FIGURE 2-28

Monthly Distribution of Basin Days Exceeding the (2008) Federal 8-hour Ozone Standard (South Coast Air Basin, for Years 2000, 2005 and 2011)

Since the mid-1970s, it has been documented that ozone concentrations in the Basin are higher on weekends than on weekdays, in spite of the fact that ozone precursors are lower on weekends than on weekdays. Similar effects have been observed in some other metropolitan areas in the nation such as San Francisco, Washington D.C., Philadelphia, and New York. This "weekend effect" was quite pronounced in previous years in the Basin. CARB has sponsored several research projects to study the causes of elevated ozone levels on weekends in the Basin. Changes in daily patterns that impact the quantity and temporal loading of emissions have been suggested as strongly contributing to these observations. Carryover of matured precursors from weekdays to weekends is also suggested as a contributing factor. It is generally expected that this difference will decrease as ozone precursor emissions continue to decline.

In 2005, more exceeding station-days[8] in the Basin occurred on either Saturdays or Sundays than any one weekday by more than a factor of two. The number of exceedances was slightly higher on Sundays than Saturdays. Figure 2-29 shows the number of station-days exceeding the federal 8-hour ozone standard for each day of the week in the Basin for the year 2011. In 2011, the weekends were still higher than the weekdays, with Sundays having the most exceedances, but by a much smaller margin than in earlier analyses. Averaged ozone concentrations by day-of-week also show a pattern similar to the average number of exceedances, with weekends somewhat higher than weekdays.

[8] The term *station-days* represents the total number of days the standard was exceeded at individual monitoring stations summed for all stations in the Basin.

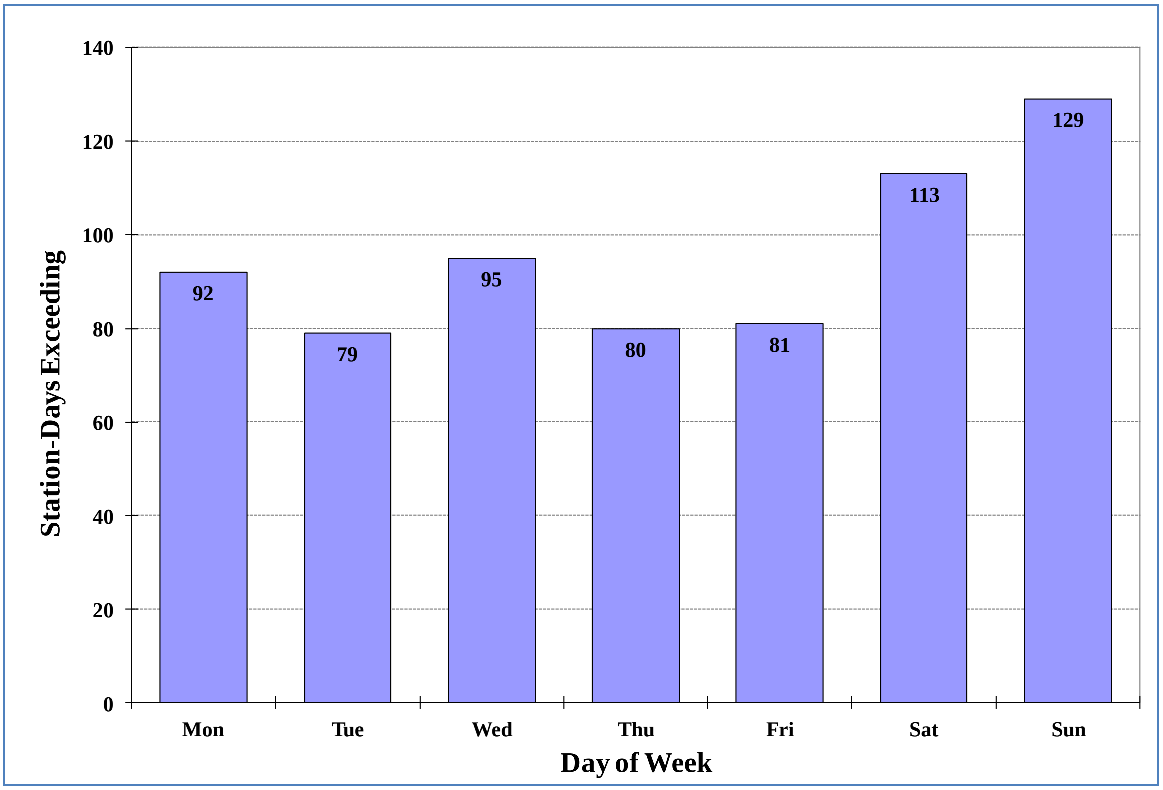


FIGURE 2-29

8-Hour Ozone Day-of-Week Variation, 2011
(Basin Station-Days Exceeding the 2008 Federal Ozone Standard)

Because time and sunlight are required for precursor organic gases and nitrogen oxides to react to form ozone, peak ozone concentrations usually occur from afternoon to early evening. By this time, the prevailing sea breeze has moved the polluted air mass miles inland from the major sources of precursor emissions. Ozone concentrations in the Basin are typically low during early morning hours, increasing rapidly after sunrise and peaking in the afternoon. However, peak concentrations occur earlier in the day for coastal areas and later in the day for locations further downwind.

Figure 2-30 illustrates the average of the smog season (May-October) 1-hour ozone concentrations for each hour of the day (shown in Pacific Standard Time), by station, for the year 2011. The average peak occurs near noon at the coastal stations (LAX) and most stations in the Basin reach their peak by the 2 p.m. The far inland stations at Central San Bernardino Valley (San Bernardino) and Central San Bernardino Mountains (Crestline, where the highest concentrations have been measured in recent years) peak near 3 or 4 p.m., but the ozone at Crestline decreases at a slower rate in the evening, leading to higher 8-hour ozone values. On the worst smog days, this station can remain relatively high through the night.

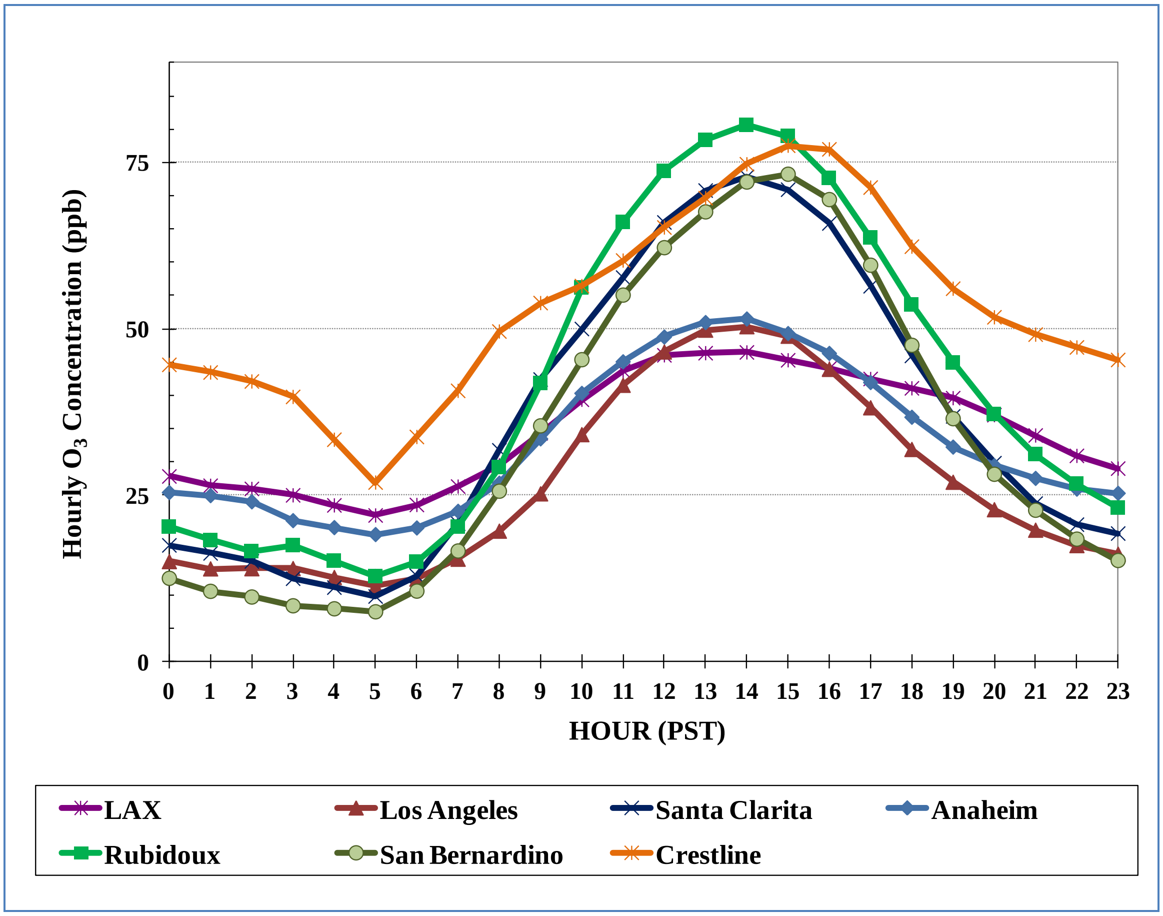


FIGURE 2-30

Diurnal Variation of Basin May-October 2011 Averaged Hourly Ozone Concentrations

Carbon Monoxide (CO)

<u>CO Air Quality</u>

The District currently monitors carbon monoxide air quality at 26 of its 34 air monitoring stations, including one station in the Coachella Valley. The highest CO concentrations are found in coastal and central Los Angeles County. The highest 8-hour average CO concentration in 2011 (4.7 ppm) was recorded in South Central Los Angeles county and was 49 percent of the federal 8-hour standard (9 ppm) and 52 percent of the state 8-hour standard (9.0 ppm). In recent years, the Basin has measured the lowest concentrations since carbon monoxide monitoring began in this region, several decades ago. The highest 1-hour average concentration in 2011 (6 ppm) was 17 percent of the federal 1-hour standard (35 ppm) and 29 percent of the state 1-hour standard (20 ppm). Concentrations in the less urbanized areas of the Basin and in the SSAB were well below the standards.

Carbon monoxide has continued to remain below the federal standards at all locations monitored since 2003. U.S. EPA redesignated the Basin to attainment of the federal CO standards, effective June 11, 2007. The highest concentrations are typically recorded in Los Angeles County, in the area of South Central Los Angeles. There have also been no exceedances of the Stage 1 episode (federal alert) level (8-hour average CO greater than or equal to 15 ppm) since 1997. Table 2-8 shows the 2011 maximum 8-hour and 1-hour average carbon monoxide concentrations by Basin and county. The annual maximum 8-hour CO concentrations at all District air monitoring stations are shown in Table A-13 in the Attachment, for the period 1995-2011.

TABLE 2-8

2011 Maximum 8-Hour and 1-Hour CO Concentrations by Basin and County

Basin/County	Maximum 8-Hr Average (ppm)	Percent of Federal Standard (9 ppm)	Maximum 1-Hr Average (ppm)	Percent of Federal Standard (35 ppm)	Area
South Coast Air Basin					
Los Angeles	4.7	49	6.0	17	South Central L.A. County
Orange	2.2	23	3.4	10	North Coastal Orange County
Riverside	1.9	20	2.7	8	Metropolitan Riverside County
San Bernardino	1.7	18	1.8	5	Central San Bernardino Valley
Salton Sea Air Basin					
Riverside	0.6	6	3.0	8	Coachella Valley

Nitrogen Dioxide (NO_2)

<u>NO_2 Air Quality</u>

In 2011, the District monitored NO_2 concentrations at 26 locations, including one in the Coachella Valley. For the newly-promulgated 1-hour NO_2 standard, the Basin had not exceeded the federal annual standard for NO_2 (0.053 ppm or 53 ppb) since 1991, when the Los Angeles County portion of the Basin recorded the last exceedance of the standard in any U.S. county. The level of the recently established 1-hour average NO_2 federal standard (100 ppb), however, was exceeded on one day in 2011. The state NO_2 standards were not exceeded in the Basin.

The maximum 1-hour and annual average NO_2 concentrations for 2011 are shown in Table 2-9, by basin and county. The Basin maximum annual average NO_2 concentration (24.6 ppb, recorded in the Pomona/Walnut Valley area) was 46 percent of the federal annual NO_2 standard and 82 percent of the state annual standard (0.030 ppm or 30 ppb). The maximum 1-hour average NO_2 concentration in the Basin (109.6 ppb, in Central Los Angeles County) was 109 percent of the new federal standard (100 ppb) and 61 percent of the state standard (180 ppb). Concentrations in the downwind Coachella Valley areas were much lower than in the Basin.

The exceedances of the federal 1-hour NO_2 standard in 2011 occurred on the same day at two stations in Los Angeles County (Central Los Angles and Long Beach). When considering the 98th percentile form of the federal standard or the 3-year design value, the Basin did not exceed the NAAQS and attainment status is not affected. Although the Basin is in attainment of the state and federal standards, NO_2 is still a concern since it is a precursor to both ozone and particulate matter. Further control of oxides of nitrogen will be required to attain the ozone and particulate standards.

The annual averages and annual maximum 1-hour average concentrations for each monitoring station in the District for the years 1995-2011 are shown in Tables A-14 and A-15, respectively, in the Attachment.

TABLE 2-9

2011 Maximum 1-Hour and Annual Average NO_2 Concentrations by Basin and County

Basin/County	Maximum 1-Hour Average (ppb)	Percent of Federal Standard (100 ppb)	Maximum Annual Average (ppb)	Percent of Federal Standard (53 ppb)	Area
South Coast Air Basin					
Los Angeles	109.6*	109	24.6	46	Central Los Angeles County; Pomona/Walnut Valley
Orange	73.8	73	16.8	31	North Orange County
Riverside	63.3	63	16.9	32	Metropolitan Riverside County
San Bernardino	76.4	76	21.1	39	Central San Bernardino Valley
Salton Sea Air Basin					
Riverside	44.7	44	8.0	15	Coachella Valley

* Although the maximum 1-hour concentrations exceeded the standard, the 98th percentile form of the design value did not exceed the NAAQS

Sulfur Dioxide (SO_2)

<u>SO_2 Air Quality</u>

In 2011, sulfur dioxide was measured at eight Basin locations. Based on the review of the SO_2 standards, U.S. EPA has established the 1-hour SO_2 standard to protect the public health against short-term exposure. The level of the standard is now set at 75 ppb 1-hour average, revoking the existing annual (0.03 ppm) and 24-hour (0.14 ppm) federal standards, effective August 2, 2010. No violations have occurred of the current federal

1-hour standards, the former federal annual or 24-hour standards, or the state standards (0.25 ppm, 1-hour or 0.04 ppm, 24-hour). The annual and 24-hour federal standards were last exceeded in the 1960's and the state standards were last exceeded in 1990.

The maximum 1-hour average SO_2 concentrations recorded in the District in 2011 are shown in Table 2-10. The highest 1-hour average SO_2 concentration (51.2 ppb in Metropolitan Riverside County) was 68 percent of the federal 24-hour standard. While SO_2 concentrations in the Basin no longer exceed standards, SO_2 is a precursor of sulfate, which is a component of PM10 and PM2.5. The highest 24-hour average SO_2, measured in the South Coastal Los Angeles County area, near the Ports of Los Angeles and Long Beach was 0.013 ppm, 32 percent of the state standard. Annual maximum 1-hour average SO_2 concentrations for each air monitoring station for the years 1995-2011 are shown in Table A-16 in the Attachment.

TABLE 2-10

2011 Maximum 1-Hour Average SO_2 Concentrations by Basin and County

Basin/County	Maximum 1-hr Average (ppb)	Percent of Federal Standard (75 ppb)	Area
South Coast Air Basin			
Los Angeles	19.8	26	Central Los Angeles
Orange	7.7	10	North Coastal Orange County
Riverside	51.2	68	Metropolitan Riverside County
San Bernardino	12.3	16	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	N.D.		Coachella Valley

N.D. = No Data. Historical measurements and lack of emissions sources indicate concentrations are well below standards.

Sulfate (SO_4^{2-})

Sulfate Air Quality

In 2011, sulfate concentrations were measured at 21 Basin locations and one in the Coachella Valley. The current form of the state standard (25 µg/m^3) is based on sulfate from PM10 (24-hour average); there is no federal sulfate standard. In 2011, the state PM10-sulfate standard was not exceeded anywhere in the Basin and this standard has not been exceeded in the Basin or the Coachella Valley in many years. Maximum concentrations by air basin and county are shown in Table 2-11. The maximum sulfate concentration (12.6 µg/m^3) recorded in the District was 50 percent of the state standard.

The maximum 24-hour average concentrations at each District air monitoring station for the years 1995-2011 are shown in Table A-17 in the Attachment.

TABLE 2-11

2011 Maximum 24-Hour Average Sulfate (PM10) Concentrations by Basin and County

Basin/County	Maximum 24-hr Average (µg/m^3)	Percent of State Standard (25 µg/m^3)	Area
South Coast Air Basin			
Los Angeles	8.0	32	Central Los Angeles County
Orange	6.5	26	Central Orange County
Riverside	5.3	21	Metropolitan Riverside County
San Bernardino	6.0	24	Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	5.7	23	Coachella Valley

Lead (Pb)

Current Lead Air Quality

In 2011 lead concentrations were measured at ten Basin urban ambient air monitoring stations and six source-specific stations near major Pb emissions sources. Except for the source-specific monitoring that is now required under the new NAAQS, there have been no violations of the lead standards at the District's regular ambient air monitoring stations since 1982, primarily as a direct result of the removal of Pb from gasoline. However, monitoring at two stations immediately adjacent to stationary sources of Pb have recorded exceedances of the standards in localized areas of the Basin in more recent years.

U.S. EPA designated the Los Angeles County portion of the Basin (excluding the high desert areas, and San Clemente and Santa Catalina Islands) as nonattainment for the recently revised (2008) federal Pb standard (0.15 µg/m^3, rolling 3-month average), due to the source-specific monitoring under the new federal regulation. This designation was based on two source-specific monitors in the Los Angeles County Cities of Vernon and Industry exceeding the new standard in the 2007-2009 period of data used by U.S. EPA. For the most recent 2009-2011 design value data period, only one of these stations (Vernon) still exceeded the Pb standard, with a maximum 3-month rolling average of 0.67 µg/m^3 that was measured in 2009 (432 percent of the federal standard). In 2011, the maximum rolling 3-month average at the Vernon site was 0.46 µg/m^3 (297 percent of the federal standard). A separate PB SIP addressing the 2008 lead standard in the Basin was submitted to U.S. EPA in June 2012.

The remainder of the Basin, other than the one source specific monitor in the Los Angeles County nonattainment area, is currently attaining the new Pb standard, including both ambient and source-specific monitoring. The old (1978) Pb standard (1.5 $\mu g/m^3$, as a quarterly average) remained in effect until one year after the area was designated for the 2008 standard, for areas in attainment of the 1978 standard. While the entire Basin has remained in attainment of the 1978 lead standard, U.S. EPA's current Pb designations for the new standard became effective on December 31, 2010 so the old standard is now fully superseded by the 2008 revised NAAQS. Nonetheless, the revoked (1978) federal lead standard (1.5 $\mu g/m^3$, as a quarterly average) and the state Pb standard (1.5 $\mu g/m^3$, as a 30-day average) were not exceeded in the District's ambient network in 2011. The highest 30-day average in 2011 at the source-specific monitor at Vernon was 0.45 $\mu g/m^3$ (30 percent of the state standard). The highest 30-day average for an ambient Pb monitor was 0.02 $\mu g/m^3$ (less than 2 percent of the state standard).

Table 2-12 shows the maximum 3-month rolling average Pb concentrations recorded in 2011, for each county in the Basin. The state standard maximum monthly average and federal standards maximum quarterly and 3-month rolling average lead concentrations at each District air monitoring site for the years 1995-2011 are given in Tables A-18 to A-20 in the Attachment.

TABLE 2-12

2011 Maximum 3-Month Rolling Pb Concentrations by Basin and County

Basin/County	Maximum 3-Month Rolling Average (μg/m^3)	Percent of Federal Standard (0.15 μg/m^3)	Area
South Coast Air Basin			
Los Angeles*	0.46	297	Central Los Angeles
Orange	N.D.		
Riverside	0.01	6	Metropolitan Riverside County
San Bernardino	0.01	6	Northwest San Bernardino Valley, Central San Bernardino Valley
Salton Sea Air Basin			
Riverside	N.D.		Coachella Valley

* This high lead concentration was measured at a site immediately downwind of a lead source.
N.D. = No Data. Historical measurements indicate concentrations are well below standards.

CHAPTER 3

AIR QUALITY IN THE RIVERSIDE COUNTY PORTION OF THE SALTON SEA AIR BASIN (COACHELLA VALLEY)

Air Quality in the SSAB, Riverside County (Coachella Valley)

Fine Particulate Matter (PM2.5)
Particulate Matter (PM10)
Ozone (O_3)
Carbon Monoxide (CO)
Nitrogen Dioxide (NO_2)
Sulfur Dioxide (SO_2)
Sulfate (SO_4^{2-})
Lead (Pb)

AIR QUALITY IN THE SSAB, RIVERSIDE COUNTY (COACHELLA VALLEY)

In 2011, the District monitored air quality at two routine locations in the Riverside county portion of the Salton Sea Desert Air Basin (SSAB), both in the Coachella Valley. Figure 3-1 shows a map of the area and topography. One monitoring station (Palm Springs) is located immediately downwind of the densely populated South Coast Air Basin (Basin). The second station (Indio) is located further downwind in the Coachella Valley.

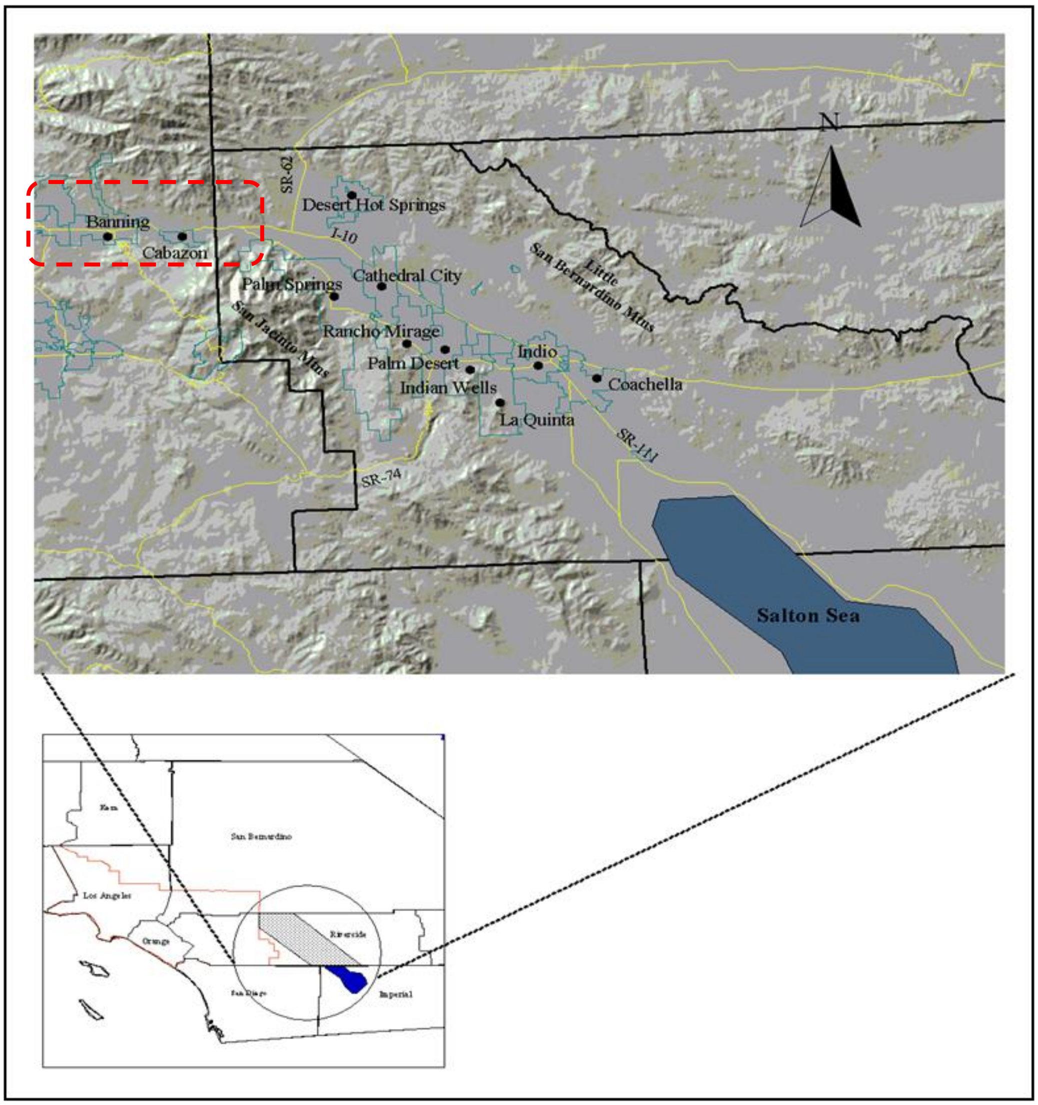


FIGURE 3-1
Location and Topography of the Coachella Valley
(Dashed red box indicates the San Gorgonio Pass; District Coachella Valley air monitoring stations are located at Palm Springs and Indio)

Federal and state standards for PM2.5, carbon monoxide (CO), and nitrogen dioxide (NO_2) were not exceeded in the Coachella Valley in 2011, nor was the state standard for Sulfate (SO_4^{2-}, from PM10). However, the Coachella Valley exceeded state and federal standards for ozone (O_3) and PM10. The most current (2008) federal 8-hour O_3 standard was exceeded on 54 days in this area in 2011.

The two days in 2011 that exceeded the 24-hour PM10 National Ambient Air Quality Standards (NAAQS) were flagged by the District for consideration under the U.S. EPA Exceptional Events Rule[9], due to high-wind natural events (windblown dust from thunderstorm outflows). With those days flagged, the Coachella Valley did not violate the 24-hour PM10 NAAQS.

The maximum concentrations measured at the District's Coachella Valley air monitoring stations in 2011 are shown in Figure 3-2, as percentages of the state and federal standards. Figure 3-3 shows the Coachella Valley 3-year (2009-2011) design values, as percentages of the current and revoked federal standards.

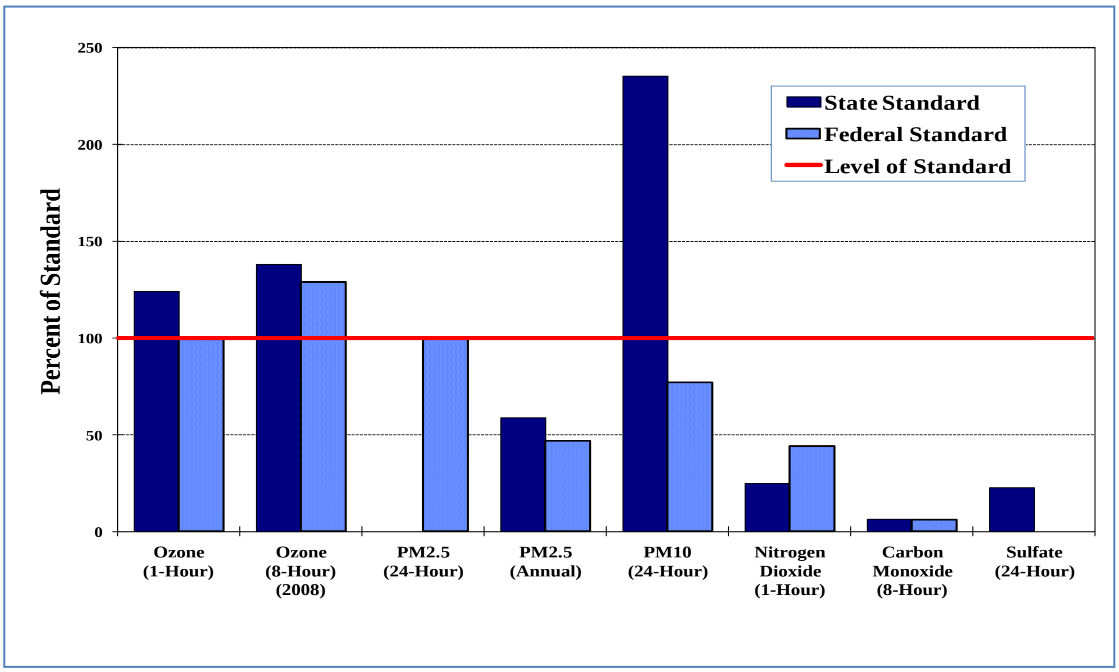


FIGURE 3-2
Coachella Valley 2011 Maximum Pollutant Concentrations
as Percent of State and Federal Standards

[9]The U.S. EPA Exceptional Events Rule, *Treatment of Data Influence by Exceptional Events*, became effective May 21, 2007. The previous U.S. EPA *Natural Events Policy* for Particulate Matter was issued on May 30, 1996. Under the Exceptional Events Rule, U.S. EPA allows certain data to be flagged in the U.S. EPA Air Quality System (AQS) database and not considered for NAAQS attainment status when that data is influenced by exceptional events, such as high winds, wildfires, volcanoes, or some cultural events (Independence Day fireworks) that meet strict requirements.

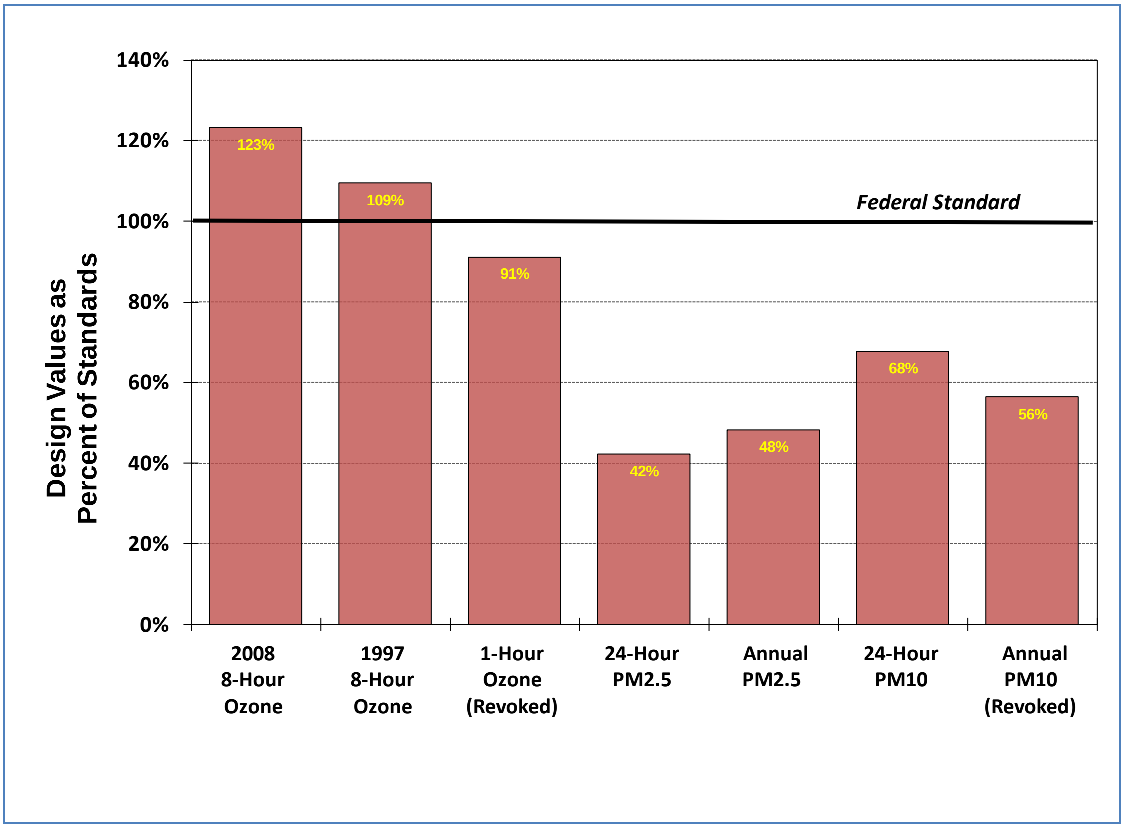


FIGURE 3-3

Coachella Valley 3-Year (2009-2011) Design Values as Percent of Federal Standards

The current NAAQS, as attainment designations for the Coachella Valley are presented in Table 3-1. Coachella Valley station data is also included, along with the Basin stations, in the tables by pollutant for the years 1995-2011, in the Attachment to this Appendix.

TABLE 3-1

National Ambient Air Quality Standards (NAAQS) Attainment Status
Coachella Valley Portion of the Salton Sea Air Basin

Criteria Pollutant	Averaging Time	Designation[a)]	Attainment Date[b)]
1979 **1-Hour Ozone**[c)]	1-Hour (0.12 ppm)	Nonattainment (Severe-17)	11/15/2007 (not timely attained[c])
1997 **8-Hour Ozone**[d)]	8-Hour (0.08 ppm)	Nonattainment (Severe-15)	6/15/2019
2008 **8-Hour Ozone**	8-Hour (0.075 ppm)	Nonattainment (Severe-15)	12/31/2027
CO	1-Hour (35 ppm) 8-Hour (9 ppm)	Unclassifiable/Attainment	N/A
NO_2[e)]	1-Hour (100 ppb)	Unclassifiable/Attainment	N/A
	Annual (0.053 ppm)	Unclassifiable/Attainment	N/A
SO_2[f)]	1-Hour (75 ppb)	Designations Pending	N/A
	24-Hour (0.14 ppm) Annual (0.03 ppm)	Unclassifiable/Attainment	N/A
PM10	24-hour (150 $\mu g/m^3$)	Nonattainment (Serious)[g)]	12/31/2006 (redesignation request submitted)
PM2.5	24-Hour (35 $\mu g/m^3$) Annual (15.0 $\mu g/m^3$)	Unclassifiable/Attainment	N/A
Lead (Pb)	3-Months Rolling (0.15 $\mu g/m^3$)	Unclassifiable/Attainment	N/A

a) U.S. EPA often only designates Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable

b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for attainment demonstration

c) 1-hour O_3 standard (0.13 ppm) was revoked, effective June 15, 2005; the Southeast Desert Modified Air Quality Management Area, including the Coachella Valley, did not attain this standard based on 2005-2007 data and has some continuing obligations under the former standard (latest 2009-2011 data shows attainment)

d) 1997 8-hour O_3 standard (0.08 ppm) was reduced (0.075 ppm), effective May 27, 2008; the 1997 O_3 standard and most related implementation rules remain in place until the 1997 standard is revoked by U.S. EPA

e) New NO_2 1-hour standard, effective August 2, 2010; attainment designations January 20, 2012; annual NO_2 standard retained

f) The 1971 annual and 24-hour SO_2 standards were revoked, effective August 23, 2010; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO_2 1-hour standard. Area designations expected in 2012, with SSAB likely designated Unclassifiable /Attainment

g) Annual PM10 standard was revoked, effective December 18, 2006; redesignation request to Attainment of the 24-hour PM10 standard is pending with U.S. EPA

Fine Particulate Matter (PM2.5)

PM2.5 has been measured in Coachella Valley since 1999 when the District began PM2.5 monitoring, using filter-based Federal Reference Method (FRM) samplers on a 1-in-3-day schedule. PM2.5 has remained relatively low compared to the South Coast Air Basin due to fewer combustion-related emissions sources and also the increased vertical mixing and horizontal dispersion in the desert area. In 2011, federal PM2.5 standards (35 µg/m^3, 24-hour average; 15.0 µg/m^3, annual average) were not exceeded at either of the two Riverside County SSAB air monitoring sites. The Coachella Valley maximum 24-hour average and annual average concentrations recorded in 2011 (35.4 µg/m^3 and 7.2 µg/m^3) were, respectively, 99.7 percent and 48 percent of the federal 24-hour and annual standards.

While not exceeding the 24-hour federal standard, the relatively high 24-hour concentration of 35.4 µg/m^3 was unusual for the Coachella Valley and occurred at Indio on one of the exceptional event days that had extremely high PM10 due to windblown dust from thunderstorm activity. The second high 24-hour PM2.5 average for the Coachella Valley was 26.3 µg/m^3 (74 percent of the federal standard), at Palm Springs. When looking at the 3-year design values (2009-2011) that considers the form of the federal standard, the Coachella Valley PM2.5 24-hour design value is 15.0 µg/m^3 (42 percent of the short-term standard) and the PM2.5 annual design value is 7.3 µg/m^3 (48 percent of the annual standard).

The annual PM2.5 state standard (12.0 µg/m^3) was not exceeded in the Coachella Valley, with the maximum annual average of 7.2 µg/m^3 (at Palm Springs) at 60 percent of the standard. This suggests that the Coachella Valley will also be in attainment of the upcoming revision to the federal annual PM2.5 standard, which has been proposed within a range from 12.0 to 13.0 µg/m^3. The Coachella Valley was between 55 and 60 percent of the proposed new PM2.5 annual standard for the year 2011. Figure 3-4 shows the trend of the annual average PM2.5 and PM10 concentrations in the Coachella Valley for the station showing the highest PM10 measurements from 1990 through 2011. Tables A-9 to A-12 in the Attachment to this appendix show the annual arithmetic mean, percentage of sampling days over the 24-hour federal standard, maximum 24-hour average concentrations, and 98^{th} percentile 24-hour concentrations for the years 1999-2011 for all monitoring stations, including the two in the Coachella Valley.

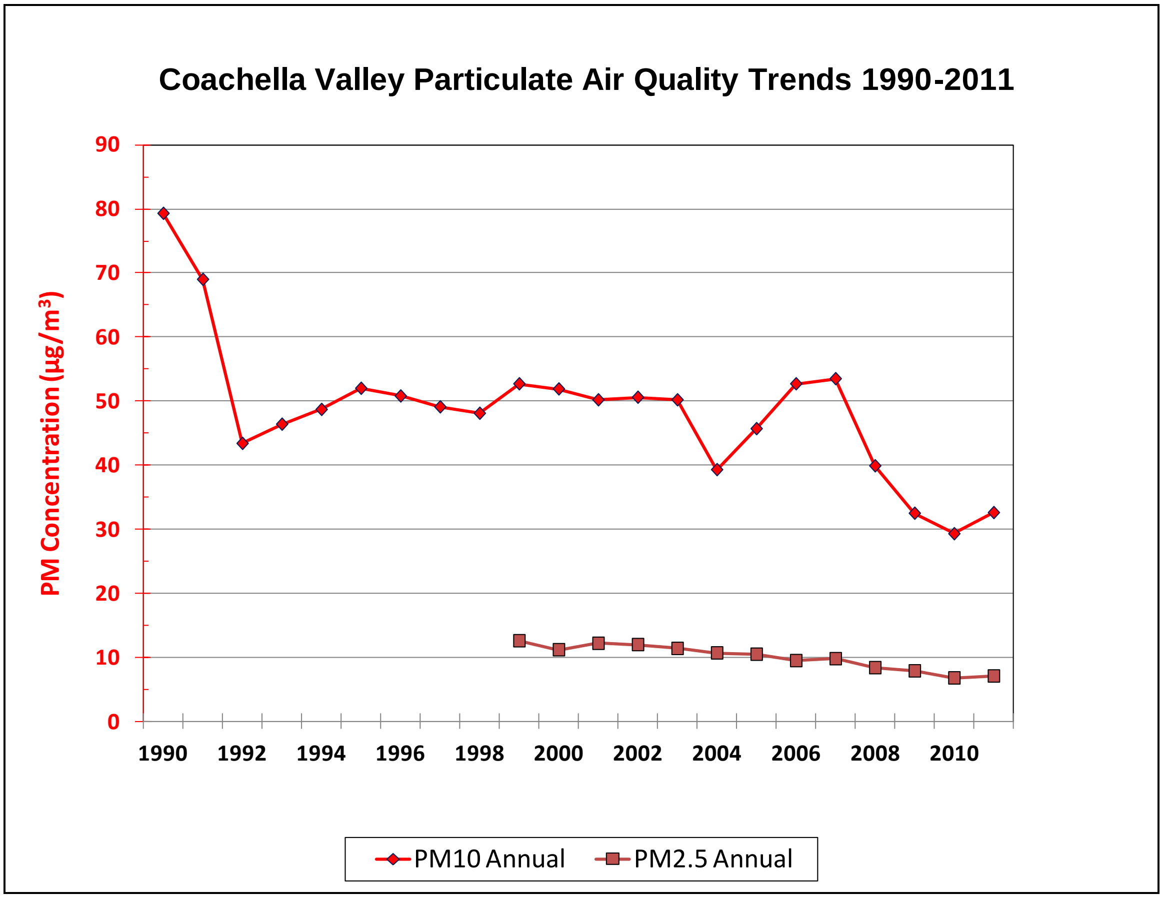


FIGURE 3-4

Coachella Valley Trend of Annual Average PM2.5 and PM10, 1990-2011

Particulate Matter (PM10)

Although exceedances of the ozone standard in the Coachella Valley area are due primarily to the transport of ozone from the densely populated areas of the Basin upwind, the same cannot be said for PM10 exceedances. PM10 exceedances in the Coachella Valley are primarily due to locally generated sources of fugitive dust (e.g., natural wind-blown sources, construction and agricultural activities, and re-entrained dust from paved road travel) and not as a result of secondary particulates generated from precursor gaseous emissions. PM10 is the only pollutant which has sometimes reached higher concentrations in the SSAB than in the Basin.

The Coachella Valley is subject to frequent high winds which generate wind-blown sand and dust, especially from disturbed soil and natural desert blowsand[10]. Air forced

[10] The blowsand process is a natural sand migration caused by the action of winds on the vast areas of sand in the Coachella Valley. The sand is supplied by weather erosion of the surrounding mountains and foothills. Although the sand migration is somewhat disrupted by urban growth in the Valley, the overall region of blowsand activity encompasses approximately 130 square miles, extending from near Cabazon in the San Gorgonio Pass to near Indio.

through the San Gorgonio Pass (also referred to as Banning Pass) creates strong northwesterly winds along the centerline of the Coachella Valley. This forcing is often related to the marine air mass and westerly onshore (sea-breeze) flows in the South Coast Air Basin pushing through the Pass. At other times, storm systems with frontal passages create strong winds through the Pass and along the Valley. Hourly averaged winds measured near Cathedral City, in the Whitewater River Wash near the centerline of the Valley, exceeded 25 mph for at least one hour on approximately one third of the days between 2005 and 2009.

High PM10 concentrations in the Coachella Valley can also be caused by desert dust and sand entrained by downdraft outflows from the thunderstorm activity that is common in the southwestern U.S. deserts in the summer. On some of the high days, transport of wind-generated dust and sand occurs with relatively light winds in the Coachella Valley, when deeply entrained dust from desert thunderstorm outflows travels to the Coachella Valley from the desert areas of southeastern California, Arizona, Nevada, or northern Mexico. All days in recent years that exceeded the 24-hour federal PM10 standard at Indio or Palm Springs would not have exceeded except for the contribution of windblown dust and sand due to strong winds in the upwind source area (high-wind natural events).

PM10 is measured daily at both Indio and Palm Springs by supplementing the primary 1-in-3-day Federal Reference Method (FRM) filter sampling at Indio and the 1-in-6-day FRM at Palm Springs with secondary continuous hourly Federal Equivalent Method (FEM) measurements at both stations.

In 2011, two high-wind exceptional events occurred in the Coachella Valley that caused high 24-hour PM10 concentrations (397 and 344 $\mu g/m^3$, at Palm Springs and Indio, respectively on July 3; 375; and 265 $\mu g/m^3$ at Indio and Palm Springs, respectively on August 28). The high PM10 concentrations measured on these days were due to strong outflows from thunderstorms over Arizona and northern Mexico that deeply entrained dust and sand and transported it to the Coachella Valley. These natural events have been flagged in the U.S. EPA Air Quality System (AQS) database to be excluded for comparison to the NAAQS, as allowed by the U.S. EPA Exceptional Events Rule. Further documentation and U.S. EPA concurrence is pending.

After application of the U.S. EPA Exceptional Event Rule (and its predecessor, the Natural Events Policy) to high wind natural events in the Coachella Valley, no days since the mid-1990s have exceeded the federal 24-hour PM10 standard at Indio or Palm Springs. As a result, AQMD requested that U.S. EPA redesignate the Coachella Valley from nonattainment to attainment of the PM10 NAAQS. Further action on this request by U.S. EPA is pending[11].

After flagging the high-wind natural events that exceeded the 24-hour PM10 federal standard, the federal PM10 standard was not exceeded in the Riverside County part of SSAB in 2011. The next highest PM10 24-hour concentration in the Coachella Valley was 120 µg/m^3, 77 percent of the 24-hour NAAQS. The former annual average PM10 federal standard (50 µg/m^3) was not exceeded, even with the exceptional events included. The highest annual average PM10 concentration in the Coachella Valley in 2011 was 32.6 µg/m^3 (65 percent of the revoked annual federal standard), with the exceptional events excluded. When considering the form of the federal PM10 standards, after consideration for the exceptional events, the 3-year (2009-2011) 24-hour PM10 design value for the Coachella Valley was 105 µg/m^3 (68 percent of the NAAQS) and the annual design value was 31 µg/m^3 (56 percent of the revoked annual PM10 NAAQS).

In 2011, the state 24-hour PM10 standard (50 µg/m^3) was exceeded on 19 days (21 days if the high-wind events are included) in the Coachella Valley, which is 5.2 percent of the sampling days (using FRM and FEM data combined). The peak value of 120 µg/m^3, not including the exceptional events, was 238 percent of the state 24-hour standard. The state annual standard (20 µg/m^3) was also exceeded. The annual average PM10 concentration of 32.6 µg/m^3 was 151 percent of the state standard.

For each routine District ambient air monitoring station, the annual arithmetic mean, percent of sampling days exceeding state and federal standards, and maximum 24-hour average concentrations are shown in Tables A-6 to A-8 in the Attachment for the years 1995-2011. Please refer to Appendix II from the 2003 AQMP for the 1976-1989 prior-year statistics and to Appendix II from the 2007 AQMP for 1990-2005 data.

Ozone (O_3)

Ozone in the atmosphere of the Riverside County portion of SSAB is both directly transported from the Basin and formed photochemically from precursors emitted upwind. These precursors are emitted in greatest quantity in the coastal and central Los Angeles County areas of the Basin. The Basin's prevailing sea breeze causes polluted air to be transported inland. As the air is being transported inland, ozone is formed, with peak concentrations occurring in the inland valleys of the Basin in an area extending from eastern San Fernando Valley through the San Gabriel Valley into the Riverside-San

[11] U.S. EPA has requested additional temporary PM10 monitoring in the southeastern Coachella Valley to further assess windblown dust in that area; this project is currently ongoing.

Bernardino area and the adjacent mountains. As the air is transported still further inland into the desert areas, ozone concentrations typically decrease somewhat due to dilution, although ozone standards can still be exceeded. Ozone concentrations and the number of days exceeding the federal ozone standard are greatest in summer; there are typically no exceedances during the winter months.

In 2011, the 1979 1-hour federal ozone standard level was not exceeded in the Coachella Valley, with 2011 being the fourth consecutive year with no exceedances of the former short-term standard. The maximum 1-hour concentration measured was 0.124 ppm, just below (99 percent of) the former 1-hour federal standard (0.125 ppm exceeds). The former (1997) 8-hour federal ozone standard was exceeded on 18 days. The current, more stringent, 2008 8-hour federal standard (0.075 ppm) was exceeded on 54 days. The maximum 8-hour ozone concentration was 0.098 ppm (130 percent of the 2008 standard and 115 percent of the 1997 standard).

The state 1-hour and 8-hour ozone standards were exceeded on 25 days and 78 days, respectively, in the Coachella Valley in 2011. The maximum 1-hour average O_3 concentration (0.124 ppm) was 136 percent of the state 1-hour standard (0.09 ppm). The maximum 8-hour average O_3 concentration (0.098 ppm) was 138 percent of the state 8-hour standard (0.070 ppm). The 1-hour ozone health advisory level (0.15 ppm) has not been exceeded in the Coachella Valley area since 1999. No stage 1 ozone episode levels (0.20 ppm) have been recorded in the Coachella Valley area since 1989.

Tables A-2 through A-5 in the Attachment show the number of days exceeding the federal 8-hour and 1-hour ozone standards, as well as the 4^{th} highest 8-hour average and maximum 1-hour concentrations, at all routine District air quality monitoring stations including the two Coachella Valley sites, for the period 1995-2011. Please refer to Appendix II from the 2003 AQMP for the 1976-1989 prior-year statistics and to Appendix II from the 2007 AQMP for 1990-2005 data. Figure 3-5 shows the trend of the total number of days exceeding federal (2008 8-hour and former 1979 1-hour) and state (8-hour and 1-hour) ozone standards at Coachella Valley monitoring sites for the years 1990-2011. Figure 3-6 shows the trend of the maximum 1-hour and 8-hour ozone concentrations in the Coachella Valley from 1990 through 2011.

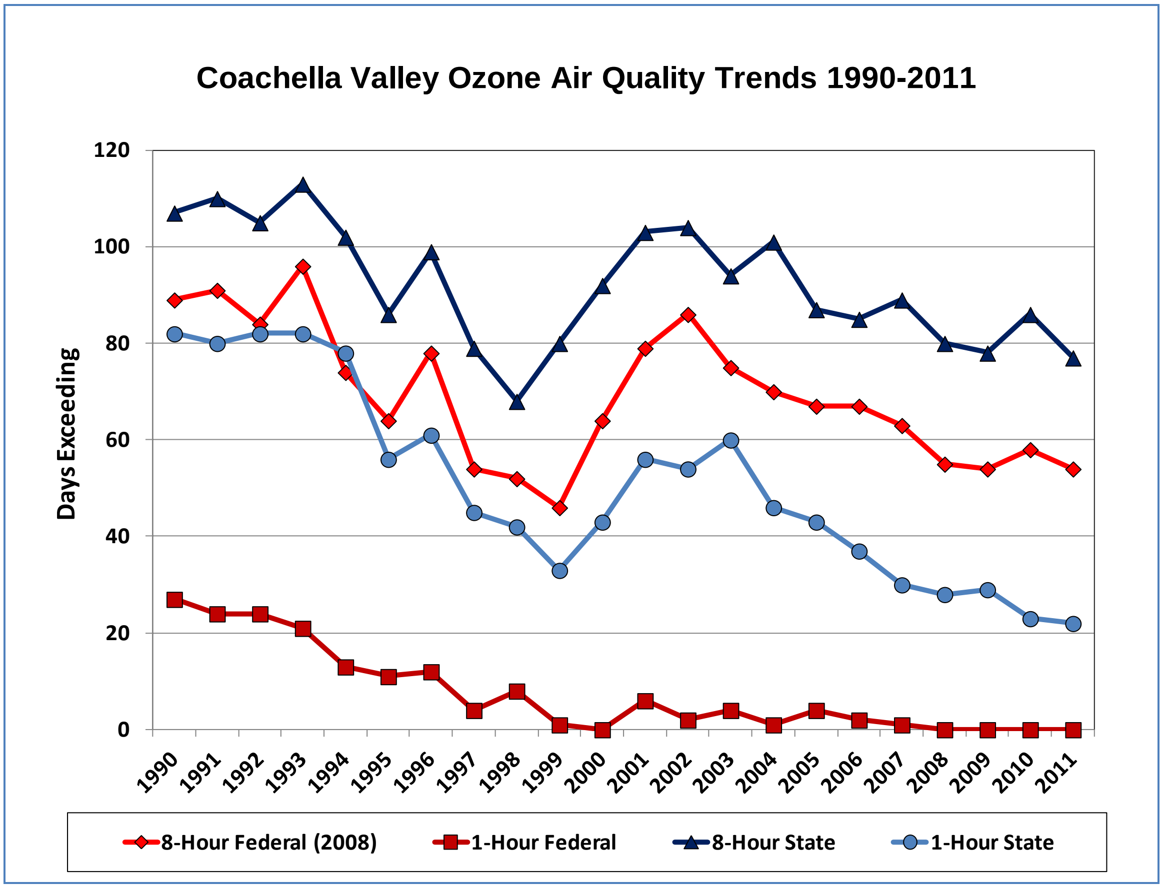


FIGURE 3-5
Coachella Valley Federal and State Ozone Trends, 1990-2011
(Number of Days Exceeding Standards)

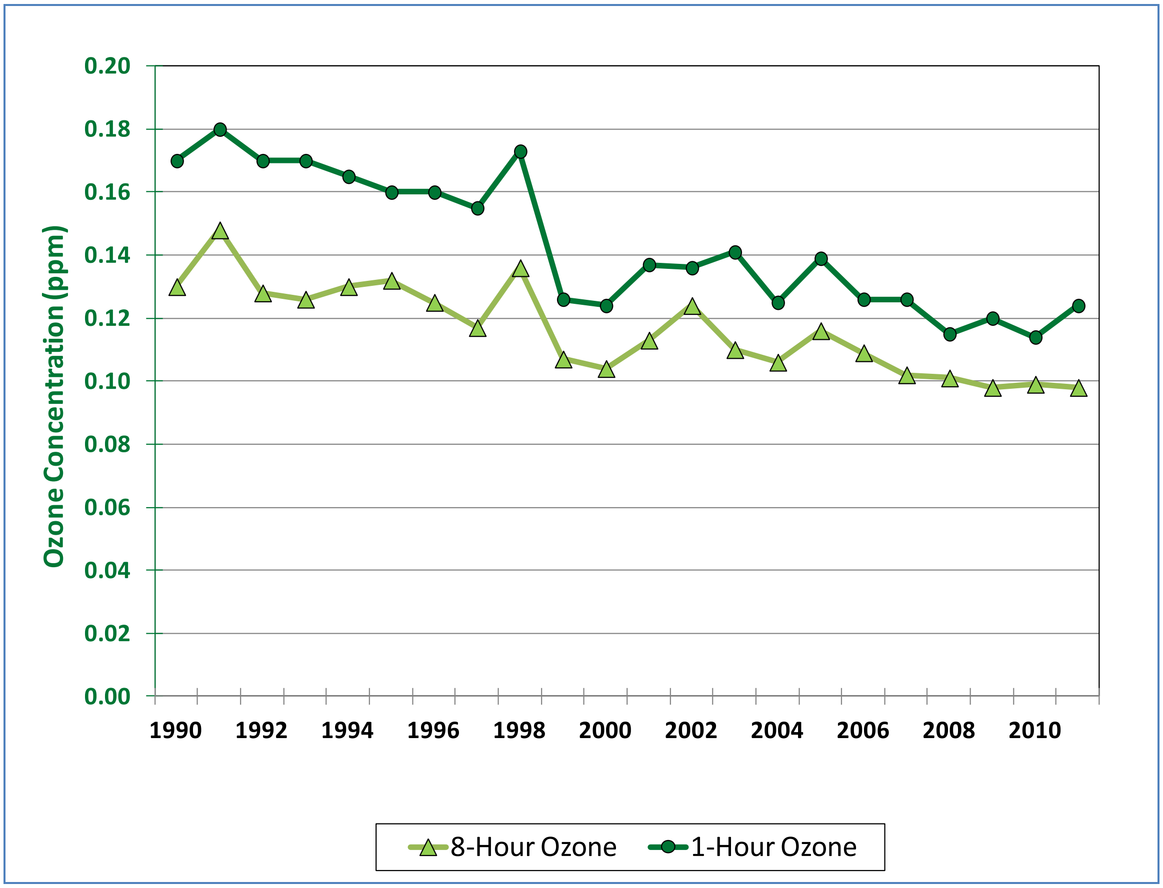


FIGURE 3-6

Trends of Coachella Valley Maximum 1-hour and 8-hour Ozone Concentrations, 1990-2011

Carbon Monoxide (CO)

Carbon monoxide was measured at one Coachella Valley air monitoring station in 2011. Neither the federal nor state standards were exceeded. The maximum 8-hour average CO concentration recorded in 2011 (0.6 ppm) was less than 7 percent of both the federal (9 ppm) and state (9.0 ppm) standards. The maximum 1-hour CO concentration (3.0 ppm) was 8 percent of the federal (35 ppm) and 15 percent of the state (20 ppm) 1-hour CO standards. Historical carbon monoxide air quality and trends in the Riverside county SSAB area shows that the area has not exceeded the federal CO standards in nearly three decades.

The annual maximum 8-hour CO concentrations at all District air monitoring stations, including the Coachella Valley, are shown in Table A-13 in the Attachment, for the period 1995-2011.

Nitrogen Dioxide (NO_2)

Nitrogen dioxide was measured at one station in the Coachella Valley in 2011. The maximum 1-hour average NO_2 concentration (44.7 ppb) was 44 percent of the new (2010) federal 1-hour standard (100 ppb) and 25 percent of the state 1-hour standard (180 ppb). The maximum annual average NO_2 concentration (8.0 ppb) was 15 percent of the federal annual standard (53 ppb) and 27 percent of the state annual standard (30 ppb).

The annual averages and annual maximum 1-hour average concentrations for each monitoring station in the District (including the Coachella Valley) for the years 1995-2011 are shown in Tables A-14 and A-15, in the Attachment.

Sulfur Dioxide (SO_2)

Sulfur dioxide concentrations were not measured in the Riverside County SSAB in 2011. Historical measurements have shown SO_2 concentrations to be well below the state and federal standards and there are no significant emissions sources of SO_2 in the Coachella Valley.

Sulfate (SO_4^{2-})

Sulfate from PM10 was measured at one station in the Coachella Valley in 2011. The maximum 24-hour average sulfate concentration was 5.7 $\mu g/m^3$ (23 percent of the 25 $\mu g/m^3$ state sulfate standard). There is no federal sulfate standard. The maximum 24-hour average concentrations at each District air monitoring station, including the Coachella Valley, for the years 1995-2011 are shown in Table A-17 in the Attachment.

Lead (Pb)

Lead concentrations were not measured at either of the two Coachella Valley air monitoring stations in 2011. Measurements in past years have shown concentrations to be less than the state and federal standards and no major sources of lead emissions are located in the Coachella Valley.

ATTACHMENT TO APPENDIX II

TABLE A-1
Air Monitoring Stations and Source/Receptor Areas

AREA #	SOURCE/RECEPTOR AREA*	LOCATION	STN #
LOS ANGELES COUNTY			
1	Central LA	Los Angeles	087
2	Northwest Coastal LA County	West Los Angeles	091
3	Southwest Coastal LA County 1	Hawthorne (moved)	094
3	Southwest Coastal LA County 2	LAX-Hastings	820
4	South Coastal LA County 1	North Long Beach	072
4	South Coastal LA County 2	South Long Beach	077
4	South Coastal LA County 3	Long Beach, Port	033
6	West San Fernando Valley	Reseda	074
7	East San Fernando Valley	Burbank	069
8	West San Gabriel Valley	Pasadena	088
9	East San Gabriel Valley 1	Azusa	060
9	East San Gabriel Valley 2	Glendora	591
10	Pomona/Walnut Valley	Pomona	075
11	South San Gabriel Valley	Pico Rivera	085
12	South Central LA County 1	Lynwood (moved)	084
12	South Central LA County 2	Compton	112
13	Santa Clarita Valley	Santa Clarita	090
ORANGE COUNTY			
16	North Orange County	La Hebra	3177
17	Central Orange County	Anaheim	3176
18	North Coastal Orange County	Costa Mesa	3195
19	Saddleback Valley 1	El Toro (moved)	3186
19	Saddleback Valley 2	Mission Viejo	3812
RIVERSIDE COUNTY			
22	Norco/Corona	Norco	4155
23	Metropolitan Riverside County 1	Riverside – Rubidoux	4144
23	Metropolitan Riverside County 2	Riverside – Downtown	4146
23	Mira Loma	Mira Loma	4165
24	Perris Valley	Perris	4149
25	Lake Elsinore Area	Lake Elsinore	4158
26	Temecula Valley	Temecula – Lake Skinner	4031
29	Banning Airport	Banning Airport	4164
30	Coachella Valley 1**	Palm Springs	4137
30	Coachella Valley 2**	Indio	4157
SAN BERNARDINO COUNTY			
32	Northwest San Bernardino Valley	Upland	5175
33	Southwest San Bernardino Valley	Ontario	5817
34	Central San Bernardino Valley 1	Fontana	5197
34	Central San Bernardino Valley 2	San Bernardino	5203
35	East San Bernardino Valley	Redlands	5204
37	Central San Bernardino Mountains	Crestline – Lake Gregory	5181
38	East San Bernardino Mountains	Big Bear Lake	5818

* Source/receptor areas and area numbers are mapped in Figure A-1

** Salton Sea Air Basin

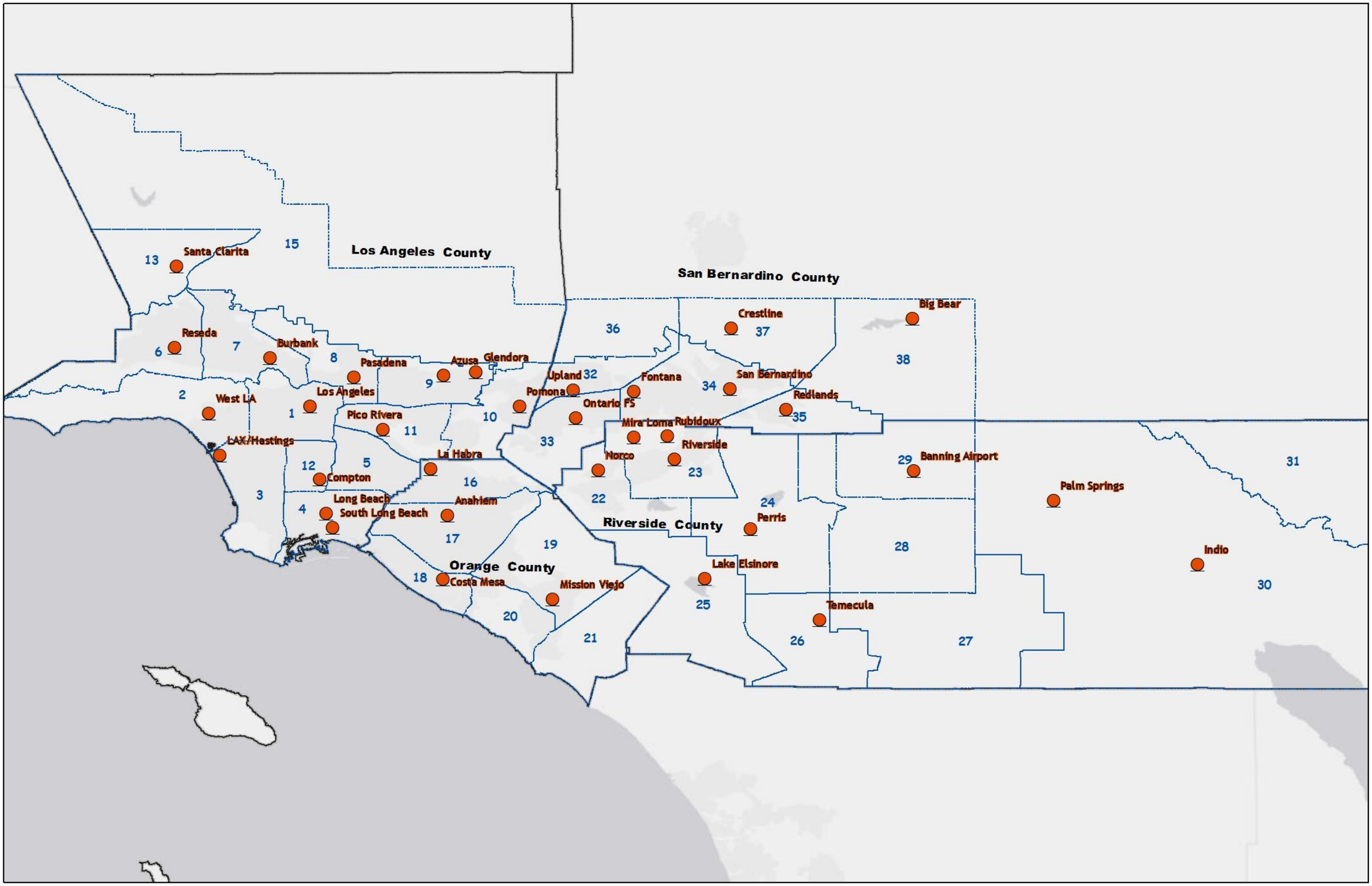


FIGURE A-1
South Coast Air Basin and Adjoining Areas of Salton Sea Air Basin
(with Source/Receptor Areas)

TABLE A-2
Ozone – Number of Days Exceeding the 2008 Federal Standard
(0.075 ppm, 8-Hour Average)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
060	East San Gabriel Valley 1	88	53	26	33	19	27	25	17	35	21	14	17	20	28	17	4	12
069	East San Fernando Valley	49	25	15	24	15	23	7	14	38	36	10	23	13	17	14	5	6
072	South Coastal Los Angeles County 1	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0
073	South Coastal Los Angeles County 3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
074	West San Fernando Valley	39	49	11	23	7	10	21	44	73	62	26	33	28	26	19	22	26
075	Pomona/Walnut Valley	73	36	16	28	14	10	5	24	38	22	17	27	18	35	23	7	16
084	South Central Los Angeles County 1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	0	0
085	South San Gabriel Valley	46	24	15	22	4	9	5	3	14	6	0*	4	5	5	3	1	0
087	Central Los Angeles	21	17	8	11	5	8	4	6	8	5	2	3	3	3	2	1	0
088	West San Gabriel Valley	70	45	21	26	10	25	23	19	40	25	12	23	11	16	12	3	5
090	Santa Clarita Valley	66	68	42	39	25	36	41	90	89	74	68	62	44	62	64	28	31
091	Northwest Coastal Los Angeles County	10	10	6	2	1	1	1	1	12	5	4	0	2	2	3	1	0
094	Southwest Coastal Los Angeles County 1	5	9	8	0	1	0	6	0	1	--	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	12	1	0	0	0	0	0	0
591	East San Gabriel Valley 2	105	69	45	49	19	30	49	33	58	33	26	29	26	45	42	24	30
ORANGE COUNTY:																		
3176	Central Orange County	8	7	1	7	1	3	0*	1	11	29	2	3	1	4	1	1	0
3177	North Orange County	18	13	8	6	4	7	2	2	7	3	0	7	8	5	3	1	0
3186	Saddleback Valley 1	8	11	5	14	--	--	--	--	--	--	--	--	--	--	--	--	--
3195	North Coastal Orange County	3	2	1	2	0	2	0	0	7	5	0	0	0	3	0	1	1
3812	Saddleback Valley 2	--	--	--	--	--	4	8	6	15	16	6	13	5	15	10	2	2
RIVERSIDE COUNTY:																		
4137	Coachella Valley 1**	52	73	54	47	38	61	77	82	70	55	61	61	58	51	53	55	49
4144	Metropolitan Riverside County	104	99	79	69	46	50	50	64	86	70	55	57	46	64	35	50	68
4149	Perris Valley	101	93	67	41	17	71	85	72	72	44	16	83	73	77	67	53	54
4157	Coachella Valley 2**	44	46	3	22	30	18	40	45	40	50	34	28	29	27	24	22	19
4158	Lake Elsinore	82	18	1	63	64	65	77	67	57	43	41	54	35	69	37	23	28
4031	Temecula Valley	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14
4164	Banning Airport	--	--	127	63	63	64	72	86	84	64	64	74	43	74	70	62	41
4165	Mira Loma	--	--	--	--	--	--	--	--	--	--	--	44	23	47	22	40	36
SAN BERNARDINO COUNTY:																		
5175	Northwest San Bernardino Valley	97	52	52	47	24	32	52	32	46	28	30	51	35	50	49	42	36
5181	Central San Bernardino Mountains	113	120	89	111	104	94	103	112	107	92	98	96	93	97	92	75	84
5197	Central San Bernardino Valley 1	88	75	47	56	30	26	43	34	69	48	45	46	43	58	48	38	39
5203	Central San Bernardino Valley 2	109	105	89	60	54	50	62	42	62	55	56	56	51	63	62	47	39
5204	East San Bernardino Valley	118	111	105	72	68	76	73	74	101	74	44	62	58	75	73	61	80
	District Maximum	118	120	127	111	104	94	103	112	107	92	98	96	93	97	92	75	84

* Less than 12 full months of data ** Salton Sea Air Basin Refer to 2003 AQMP for 1976 to 1994 data

TABLE A-3
Ozone – Number of Days Exceeding the Former (1979) 1-Hour Federal Standard
(0.12 ppm, 1-Hour Average)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
060	East San Gabriel Valley 1	63	26	11	19	2*	11	9	5	11	2	4	7	3	7	4	0	0
069	East San Fernando Valley	20	6	2	7	0	3	2	1	4	2	2	6	0	1	1	0	0
072	South Coastal Los Angeles County 1	0	0	0*	0	1	0	0	0	0	0	0	0	0	0	0	0	0
033	South Central Los Angeles County 3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
074	West San Fernando Valley	8	11	0	7	0	0	2	9	14	2	2	6	1	0	1	0	3
075	Pomona/Walnut Valley	47	16	7	18	2	3	1	5	13	4	3	9	2	5	1	0	0
084	South Central Los Angeles County 1	0	1	0	0	0	0	0	0	0	0	0	0	0	0*	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0	0
085	South San Gabriel Valley	20	32	6	10	0	2	1	0	1	0	--	1*	2	0	1	0	0
087	Central Los Angeles	5	24	0	5	1	1	0	0	1	0	0	0	0	0	1	0	0
088	West San Gabriel Valley	44	54	5	14	0	7	1	3	7	1	2	5	3	0	3	0	0
090	Santa Clarita Valley	26	68	13	16	0	1	9	32	35	13	11	20	2	8	5	1	3
091	Northwest Coastal Los Angeles County	1	13	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0
094	Southwest Coastal Los Angeles County 1	0	1	0	0	1	0	0	0	0	0*	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	0*	0	0	0	0	0	0	0
591	East San Gabriel Valley 2	73	49	18	28	3	11	13	12	22	5	8	10	3	12	7	0	4
ORANGE COUNTY:																		
3176	Central Orange County	2	1	0	2	0*	1	0*	0	2	0	0	0	1	0	0	0	0
3177	North Orange County	4	5	1	5	0	1	0	0	1	0	0	3	1	0	0	0	0
3186	Saddleback Valley 1	1	2	2	2	0	1*	--	--	--	--	--	--	--	--	--	--	--
3195	North Coastal Orange County	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3812	Saddleback Valley 2	--	--	--	--	--	2*	1	2	4	0	1	0	0	0	0	0	0
RIVERSIDE COUNTY:																		
4137	Coachella Valley 1**	9	12	4*	8	1	0	6	2	4	1	4	2	1	0	0	0	0
4144	Metropolitan Riverside County	52	36	13*	32	3	3	7	12	18	8	3	8	2	8	0	1	4
4149	Perris Valley	36	31	6	8	0	15	19	4	7	2	1	12	4	4	1	0	2
4157	Coachella Valley 2**	3	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
4158	Lake Elsinore	23	17	4	22	5	1	12	6	7	2	3	3	3	6	1	0	1
4031	Temecula Valley	0	0*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
4164	Banning Airport	--	--	--	25	5	4	16	13	27	7	10	8	1	10	1	0	3
4165	Mira Loma	--	--	--	--	--	--	--	--	--	--	--	4	0	4	0	0	1
SAN BERNARDINO COUNTY:																		
5175	Northwest San Bernardino Valley	67	35	12	30	4	10	14	5	15	3	8	14	7	9	3	1	5
5181	Central San Bernardino Mountains	65	62	29	57	30	17	26	22	34	9	18	9	13	16	7	6	8
5197	Central San Bernardino Valley 1	57	38	10	32	4	7	13	8	26	7	9	12	9	8	3	2	5
5203	Central San Bernardino Valley 2	61	63	32	39	14	7	18	6	19	6	9	10	8	11	2	1	2
5204	East San Bernardino Valley	69	65	35	43	12	11	21*	23	38	12	6	11	7	12	1	1	7
	District Maximum	73	68	35	57	30	17	26	32	38	13	18	20	13	16	7	6	8

* Less than 12 full months of data   ** Salton Sea Air Basin   Refer to 2003 AQMP for 1976 to 1994 data

TABLE A-4

Ozone – Annual Maximum 4th Highest 8-Hour Average (ppb)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
060	East San Gabriel Valley 1	138	127	113	126	95	108	102	97	104	92	87	90	96	101	91	76	82
069	East San Fernando Valley	106	98	95	101	84	97	87	91	96	89	81	97	88	92	86	77	81
072	South Coastal Los Angeles County 1	71	73	67	65	68	66	60	59	63	70	59	56	56	64	64	57	60
033	South Coastal Los Angeles County 3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	57
074	West San Fernando Valley	101	110	83	100	81	80	89	111	119	101	98	103	92	95	93	87	91
075	Pomona/Walnut Valley	136	113	95	120	89	88	82	99	109	95	96	108	102	100	95	81	86
084	South Central Los Angeles County 1	51	57	53	51	41	50	54	49	57	65	63	64	56	55+	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	64	50	61
085	South San Gabriel Valley	105	93	97	102	80	86	81	74	82	78	51	78	79	77	72	59	63
087	Central Los Angeles	91	93	81	96	79	85	76	77	82	77	70	75	72	73	73	64	60
088	West San Gabriel Valley	130	117	100	117	86	104	90	95	101	93	85	96	89	91	95	75	77
090	Santa Clarita Valley	130	123	116	127	95	97	112+	131	137	107	118	112	101	108	103	88	101
091	Northwest Coastal Los Angeles County	81	88	78	70	69	71	64	73	83	76	76	67	67	73	75	70	62
094	Southwest Coastal Los Angeles County 1	78	86	83	63	66	65	79	64	70	56*	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	86*	68	62	66	65	61	59	62
591	East San Gabriel Valley 2	148	140	121	142	96	112	110	110	123	95	97	106	104	112	108	91	95
ORANGE COUNTY:																		
3176	Central Orange County	82	81	68	87	61	74	66	69	80	88	75	70	73	76	68	64	67
3177	North Orange County	96	90	82	93	78	83	73	71	80	75	65	89	82	78	75	71	69
3186	Saddleback Valley 1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3195	North Coastal Orange County	75	70	70	76	70	67	69	66	79	75	66	60	65	75	66	60	67
3812	Saddleback Valley 2	--	--	--	--	--	87	72	81	95	84	78	90	80	92	84	69	74
RIVERSIDE COUNTY:																		
4137	Coachella Valley 1**	106	116	101	108	98	96	111	109	105	99	108	98	97	96	96	93	92
4144	Metropolitan Riverside County	142	130	118	136	104	106	109	109	120	111	105	111	99	111	89	94	107
4149	Perris Valley	132	122	105	115	91	111	124	107	116	95	82	113	103	106	101	100	94
4157	Coachella Valley 2**	96	98	82	97	89	87	93	97	100	94	92	85	87	88	85	84	85
4158	Lake Elsinore	126	108	111	128	106	98	111	104	112	102	97	101	97	108	96	88	92
4031	Temecula Valley	81	67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	73
4164	Banning Airport	101	107	93	81	114+	102	116	113	127	112	119	104	95	108	100	99	100
4165	Mira Loma	--	--	--	--	--	--	--	--	--	--	105	103	100	109	86	92	96
SAN BERNARDINO COUNTY:																		
5175	Northwest San Bernardino Valley	145	138	112	137	103	117	120	105	114	102	101	112	112	108	102	91	98
5181	Central San Bernardino Mountains	167	155	125	183	133	122	133	131	130	122	130	111	126	120	108	109	106
5197	Central San Bernardino Valley 1	143	137	115	132	98	100	123	114	132	111	113	114	112	110	100	94	105
5203	Central San Bernardino Valley 2	152	145	127	145	115	111	128	105	123	112	113	118	117	112	101	96	101
5204	East San Bernardino Valley	162	138	126	148	115	112	131	117	137	119	113	124	112	112	100	97	113
	District Maximum	167	155	127	183	133	122	133	131	137	122	130	124	126	120	108	109	113

+ Site relocated   * Less than 12 full months of data   ** Salton Sea Air Basin

TABLE A-5
Ozone – Annual Maximum 1-Hour Average (ppm)

	LOCATION	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
087	Central Los Angeles	.34	.21	.30	.31/	.29	.32	.40	.26	.29	.30	.22	.22
060	East San Gabriel Valley 1	.38	.32	.40	.45	.41	.35	.36	.39	.31	.36	.31	.30
069	East San Fernando Valley	.35	.31	.30	.39	.35	.27	.25	.31	.26	.30	.28	.23
091	Northwest Coastal Los Angeles County	.28	.18/	.24/	.26	.21	.23	.28	.23	.27/	.27	.20	.28
072	South Coastal Los Angeles County 1	.16	.15	.19	.21	.20	.23	.22	.30	.27	.23	.18	.17
033	South Coastal Los Angeles County 3	--	--	--	--	--	--	--	--	--	--	--	--
074	West San Fernando Valley	.27	.34	.27	.33	.38	.25	.22	.26	.26	.25	.22	.22
075	Pomona/Walnut Valley	.36	.32	.41	.35	.37	.33	.31	.34	.31	.33	.27	.29
094	Southwest Coastal Los Angeles County	--	--	--	--	--	--	--	--	--	--	.19	.20
820	Southwest Coastal Los Angeles County	--	--	--	--	--	--	--	--	--	--	--	--
088	West San Gabriel Valley	.34	.32	.42	.44	.41	.33	.37/	.34	.30	.37	.26	.28
090	Santa Clarita Valley	.33	.33	.32	.32	.36	.29	.26/	.29	.27	.24	.24	.21
084	South Central Los Angeles County 1	.24	.24	.18	.29	.18	.21	.26	.23	.27	.21	.20	.24
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--
085	South San Gabriel Valley	.35	.32	.43	.39	.39	.35	.39	.33	.27	.31	.24	.28
591	East San Gabriel Valley 2	--	--	--	--	.49	.39	.36	.38	.34	.39	.35	.33
3176	Central Orange County	.30	.19	.29	.33	.28	.26	.26	.30	.25	.25	.20	.22
3177	North Orange County	.30	.25	.35	.38	.31	.27	.32	.27	.32	.34	.25	.24
3195	North Coastal Orange County	.16	.18	.22	.21/	.16	.20	.18	.25	.25	.21	.17	.16
3186	Saddleback Valley 1	.23	.20	.34	.32	.34	.33	.27	.29	.30	.28	.23	.20
3812	Saddleback Valley 2	--	--	--	--	--	--	--	--	--	--	--	--
4137	Coachella Valley 1**	.22	.21	.20	.24	.21	.19	.19	.19	.20	.24	.18	.17
4157	Coachella Valley 2**	.16	.19	.17	.21	.11	.18	.17	.18	.19	.20	--	.16
4155	Norco/Corona	.33	.36	.40	.33/	.34	.37	.35	.35	.30	.35	.27	.24
4141	Hemet/San Jacinto Valley	.19	.25	.27	--	--	--	--	--	.18*	.23	.18	.18
4144	Metropolitan Riverside County 1	.36	.35	.39	.34	.37	.30	.31	.36	.32	.35	.25	.29
4149	Perris Valley	.22	.28	.32	.25	.29	.24	.28	.26	.22	.29	.22	.20
4150	San Gorgonio Pass	.28	.27	.30	.27	.26	.23	.24	.26	.25	.29	.22	.21
4164	BanningAirport	--	--	--	--	--	--	--	--	--	--	--	--
4163	Temecula Valley	.21	.17	.23	--	--	--	--	--	--	--	--	--
4158	Lake Elsinore	.20	.23	.30	--	--	--	--	--	--	--	--	--
5203	Central San Bernardino Valley 2	.32	.37	.36	.34	.36	.36/	.30	.32	.30	.27/	.30	.25
5204	East San Bernardino Valley	.35	.33	.39	.34/	.32	.24	.29	.30	.29	.33/	.29	.24
5175	Northwest San Bernardino Valley	--	--	--	--	--	--	--	.36	.32	.33	.29	.28
5197	Central San Bernardino Valley 1	.38	.39	.42	.42	.42	.35/	.31	.32	.32	.34	.31	.29
5181	Central San Bernardino Mountains 1	.23	.32	.33	.40	.31	.35	.32	.28	.34	.30	.26	.29
	District Maximum	.38	.39	.43	.45	.49	.39	.40	.39	.34	.39	.35	.33

* Less than 12 full months of data. / Station location change

** Salton Sea Air Basin

Refer to 2003 AQMP for 1955 to 1975 data

TABLE A-5 (continued)
Ozone – Annual Maximum 1-Hour Average (ppm)

LOCATION	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
087 Central Los Angeles	.21	.25	.20	.19	.20	.16	.19	.17	.14	.12	.15	.13
060 East San Gabriel Valley 1	.30	.33	.23	.28	.27	.24	.25	.21	.20	.16	.20	.14
069 East San Fernando Valley	.24	.20	.20	.22	.22	.18	.17	.17	.14	.13	.18	.12
091 Northwest Coastal Los Angeles County	.24	.25	.16	.18	.17	.18	.16	.14	.14	.11	.13	.12
072 South Coastal Los Angeles County 1	.16	.16	.12	.11	.15	.14	.16	.11	.11	.10	.12	.13
033 South Coastal Los Angeles County 3	--	--	--	--	--	--	--	--	--	--	--	--
074 West San Fernando Valley	.25	.23	.19	.22	.17	.19	.14	.15	.21	.12	.16	.10
075 Pomona/Walnut Valley	.29	.25	.24	.24	.26	.21	.24	.22	.19	.16	.18	.14
094 Southwest Coastal Los Angeles County	.22	.19	.10	.11	.15	.13	.11	.12	.13	.11	.09	.15
820 Southwest Coastal Los Angeles County	--	--	--	--	--	--	--	--	--	--	--	--
088 West San Gabriel Valley	.29	.27	.26	.23	.27	.22	.26	.21	.17	.14	.17	.12
090 Santa Clarita Valley	.30	.25	.23	.24	.22	.22	.26	.21	.17	.16	.18	.12
084 South Central Los Angeles County 1	.21	.14	.15	.16	.17	.12	.12	.09	.10	.08	.09	.12
112 South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--
085 South San Gabriel Valley	.30	.26	.19	.26	.26	.19	.22	.18	.14	.13	.18	.12
591 East San Gabriel Valley 2	.34	.34	.29	.32	.30	.28	.30	.22	.21	.17	.22	.14
3176 Central Orange County	.27	.24	.18	.25	.22	.17	.21	.13	.13	.10	.11	.10*
3177 North Orange County	.29	.26	.21	.21	.21	.19	.25	.16	.15	.13	.18	.12
3195 North Coastal Orange County	.13	--	.15	.17	.15	.13	.12	.11	.10	.10	.12	.10
3186 Saddleback Valley 1	.21	.23	.19	.24	.16	.16	.18	.15	.14	.13	.16	.10
3812 Saddleback Valley 2	--	--	--	--	--	--	--	--	--	--	--	--
4137 Coachella Valley 1**	.20	.19	.17	.18	.15*	.17	.17	.16	.16	.16	.17	.13
4157 Coachella Valley 2 **	--	.16	.16	.18	.14	.16	.12	.14	.12	.11	.13	.13
4155 Norco/Corona	.25	.23	.17	.22	.23	.16	.17	.19	.16	--	--	--
4141 Hemet/San Jacinto Valley	.18	.19	.22	.19	.15	.18	.16	.15	.12	--	--	--
4144 Metropolitan Riverside County	.28	.27	.29	.24	.26	.26	.25	.21	.20	.19	.20	.14
4149 Perris Valley	.23	.21	.19	.20	.21	.20	.18	.20	.18	.14	.15	.11
4150 San Gorgonio Pass	.26	.23	.22	.20	.16	.16	.20	.18	.19	.13	.12/	--
4164 Banning Airport	--	--	--	--	--	--	--	--	--	--	.17	.14
4031 Temecula Valley	--	--	--	.17*	.13	.13	.10*	.11	.10	--	--	--
4158 Lake Elsinore	--	.24	.19	.20	.17	.19	.19	.19	.15	.16	.17	.14
5203 Central San Bernardino Valley 2	.28	.30	.29	.25	.28	.21	.25	.20	.24	.20	.21	.16
5204 East San Bernardino Valley	.29	.27	.30	.25	.27	.27	.23	.24	.22	.20	.22	.15
5175 Northwest San Bernardino Valley	.35	.32	.29	.27	.28	.24	.25	.24	.22	.19	.21	.15
5197 Central San Bernardino Valley 1	.29	.32	.27	.29	.28	.24	.25	.22	.22	.17	.20	.14
5181 Central San Bernardino Mountains 1	.29	.27	.33	.27	.28	.24	.27	.26	.20	.21	.24	.17
District Maximum	.35	.34	.33	.32	.30	.28	.30	.26	.24	.21	.24	.17

* Less than 12 full months of data. / Station location change

** Salton Sea Air Basin

Refer to 2003 AQMP for 1955 to 1975 data

TABLE A-5 (concluded)
Ozone – Annual Maximum 1-Hour Average (ppm)

LOCATION	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
087 Central Los Angeles	.136	.116	0.122	0.152	0.110	0.121	0.108	0.115	0.109	0.139	0.098	0.087
060 East San Gabriel Valley 1	.174	.189	0.136	0.150	0.134	0.145	0.165	0.158	0.135	0.15	0.104	0.111
069 East San Fernando Valley	.152	.129	0.128	0.134	0.137	0.142	0.166	0.116	0.133	0.145	0.111	0.12
091 Northwest Coastal Los Angeles County	.104	.099	0.118	0.134	0.107	0.114	0.099	0.117	0.11	0.131	0.099	0.098
072 South Coastal Los Angeles County 1	.118	.091	0.084	0.099	0.090	0.091	0.081	0.099	0.093	0.089	0.101	0.073
033 South Coastal Los Angeles County 3	--	--	--	--	--	--	--	--	--	--	--	0.074
074 West San Fernando Valley	.109	.140	0.152	0.179	0.131	0.138	0.158	0.129	0.123	0.135	0.122	0.13
075 Pomona/Walnut Valley	.152	.144	0.150	0.161	0.131	0.140	0.151	0.153	0.141	0.138	0.115	0.119
094 Southwest Coastal Los Angeles County	.095	.098	0.088	0.110	0.069*	--	--	--	--	--	--	--
820 Southwest Coastal Los Angeles County	--	--	--	--	0.120*	0.086	0.084	0.087	0.086	0.077	0.089	0.078
088 West San Gabriel Valley	.157	.160	0.137	0.152	0.130	0.145	0.151	0.149	0.122	0.176	0.101	0.107
090 Santa Clarita Valley	.131/	.184	0.169	0.194	0.158	0.173	0.156	0.135	0.16	0.14	0.126	0.144
084 South Central Los Angeles County 1	.089	.077	0.072	0.081	0.083	0.111	0.088	0.102	0.078*	--	--	--
112 South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	0.104	0.081	0.082
085 South San Gabriel Valley	.139	.132	0.111	0.128	0.104	0.077	--	0.135	0.107	0.131	0.112	0.096
591 East San Gabriel Valley 2	.172	.190	0.152	0.162	0.134	0.160	0.175	0.147	0.156	0.15	0.124	0.134
3176 Central Orange County	.132	.114	0.103	0.136	0.120	0.095	0.113	0.127	0.105	0.093	0.104	0.088
3177 North Orange County	.137	.107	0.121	0.165	0.099	0.094	0.146	0.152	0.104	0.115	0.118	0.095
3195 North Coastal Orange County	.102	.098	0.087	0.107	0.104	0.085	0.074	0.082	0.094	0.087	0.097	0.093
3186 Saddleback Valley 1	.129	--	--	--	--	--	--	--	--	--	--	--
3812 Saddleback Valley 2	.119	.125	0.136	0.153	0.116	0.125	0.123	0.108	0.118	0.121	0.117	0.094
4137 Coachella Valley 1**	.124	.137	0.136	0.141	0.125	0.139	0.126	0.126	0.11	0.12	0.114	0.124
4157 Coachella Valley 2 **	.112	.114	0.114	0.123	0.111	0.114	0.103	0.106	0.12	0.097	0.1	0.099
4155 Norco/Corona	--	--	--	--	--	--	--	--	--	--	--	--
4141 Hemet/San Jacinto Valley	--	--	--	--	--	--	--	--	--	--	--	--
4144 Metropolitan Riverside County	.140	.143	0.155	0.169	0.141	0.144	0.151	0.131	0.146	0.116	0.128	0.128
4149 Perris Valley	.164	.152	0.147	0.155	0.128	0.088	0.169	0.139	0.142	0.125	0.122	0.125
4150 San Gorgonio Pass	--	--	--	--	--	--	--	--	--	--	--	--
4164 Banning Airport	.138	.149	0.160	0.166	0.156	0.144	0.139	0.129	0.149	0.133	0.124	0.127
4031 Temecula Valley	--	--	--	--	--	--	--	--	--	--	--	0.105
4158 Lake Elsinore	.128	.151	0.139	0.154	0.130	0.149	0.142	0.13	0.139	0.128	0.107	0.133
5203 Central San Bernardino Valley 2	.149	.184	0.147	0.160	0.157	0.163	0.154	0.153	0.157	0.15	0.129	0.135
5204 East San Bernardino Valley	.152	.167*	0.158	0.174	0.160	0.146	0.165	0.149	0.154	0.145	0.128	0.151
5175 Northwest San Bernardino Valley	.184	.171	0.139	0.155	0.138	0.149	0.166	0.145	0.155	0.146	0.131	0.145
5197 Central San Bernardino Valley 1	.169	.165	0.159	0.176	0.149	0.150	0.159	0.144	0.162	0.142	0.143	0.144
5181 Central San Bernardino Mountains 1	.176	.171	0.161	0.163	0.163	0.182	0.164	0.171	0.176	0.149	0.142	0.16
District Maximum	.176	.190	0.169	0.194	0.163	0.182	0.175	0.171	0.176	0.176	0.143	0.160

* Less than 12 full months of data. / Station location change

** Salton Sea Air Basin

Refer to 2003 AQMP for 1955 to 1975 data

TABLE A-6
Particulate Matter (PM10)[#] – Annual Arithmetic Mean (μg/m^3)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
060	East San Gabriel Valley 1	49	45	46	41	56	46	45	46	44	35	35	32	36+	35	32	30	33
069	East San Fernando Valley	42	42	45	36	44	39	41	38	38*	38	34	36	40	36	39	30	29
072	South Coast Los Angeles County 1	39	35	41	32	39	38	37	36	33	33	30	31	30+	29	31	22	24
077	South Coast Los Angeles County 2	--	--	--	--	--	--	--	--	--	38	43	45	41+	36	33	27	29
087	Central Los Angeles	43	41	43	37	45	40	44	39	35	33	30	30	33	31*	33	27	29
090	Santa Clarita Valley	37	33	33	30	38	33	32	33	32	28	26		30+	26	23	21	21
094	Southwest Coastal Los Angeles County 1	36	33	36	33	36	36	37	37	30	31*	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	25	23	27	29	26	25	21	22
ORANGE COUNTY:																		
3176	Central Orange County	44	35	39	36	49	40	36	34	33	34	28	33	31+	29+	31	22	25
3186	Saddleback Valley 1	38	30	35	31	37	29	--	--	--	--	--	--	--	--	--	--	--
3812	Saddleback Valley 2	--	--	--	--	29	28	26	31	27	24	19	23	23	23	24	18	19
RIVERSIDE COUNTY:																		
4137	Coachella Valley 1**	27	29	26	26	29	24	27+	27	27	26	26	25+	31	23+*	23	19	19+
4144	Metropolitan Riverside County 1	69	61	65	56	72	60	63	59	57	56	52	54	55+	47	43	33	34
4149	Perris Valley	47	40	45	38	50	41	41	45	44	41	39	45	55+	38*	35	28	29
4150	San Gorgonio Pass	30	34	38	28	--	--	--	--	--	--	--	--	--	--	--	--	--
4155	Norco/Corona	54	44	50	47	55	49	--	45	41	38	32	37	40+	34	36	27	28
4157	Coachella Valley 2**	52+	51+	49+	48+	53	52+	50+	51+	50+	39+	46	53+	54+	40+	33+	29	33+
4163	Temecula Valley	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4164	Banning Airport	--	--	--	27	35	29	35	28	29	29	27	31	33	26	26	22	20
4165	Mira Loma	--	--	--	--	--	--	--	--	--	--	--	64	69	57	53	42	41
SAN BERNARDINO COUNTY:																		
5171	Southwest San Bernardino Valley 1	54	51	51	47	55	--	--	--	--	--	--	--	--	--	--	--	--
5181	Central San Bernardino Mountains	20	24	24	25	27	24	--	37*	26*	26	26	26	26	24*	25	19	19
5197	Central San Bernardino Valley 1	61	55	54	50	60	53	51	50	47*	48	50	54	55+	40	40	34	32
5203	Central San Bernardino Valley 2	57	53	51	46	57	50	52	50	45	49	42	46	51+	43	42	32	32
5204	East San Bernardino Valley	48	46	43	41	47	46	47	41	37	39	33	36	40	29	30	26	26
5817	Southwest San Bernardino Valley 2	--	--	--	--	66	50	52	45	43	43	41	42	43+	39	36	32	31
	District Maximum	69	61	65	56	72	60	63	59	57	56	52	64	69+	57	53	42	41

* Less than 12 full months of data.
** Salton Sea Air Basin
\+ Excludes data flagged for exceptional events
\# Federal Reference Method (FRM) filter data only

Refer to 2003 AQMP for 1985-1994 data

TABLE A-7
Particulate Matter (PM10)[#] – Percent of Sampling Days Exceeding State (50 μg/m^3) and Federal (150 μg/m^3) 24-Hour Standards

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
060	East San Gabriel Valley 1	40/2	41/0	40/0	28/0	58/0	42/0	38/0	40/0	35/0	15/0	22/0	12/0	20/0+	27/0	14/0	9/0	15/0
069	East San Fernando Valley	25/0	25/0	30/0	15/0	35/0	23/0	23/0	12/0	14/0*	12/0	8/0	19/0	19/0	13/0	18/0	2/0	4/0
072	South Coast Los Angeles County 1	19/0	15/0	18/0	10/0	22/0	21/0	17/0	9/0	7/0	7/0	9/0	10/0	9/0+	2/0	5/0	0/0	0/0
077	South Coast Los Angeles County 2	--	--	--	--	--	--	--	--	--	20/0	31/0	33/0	38/0+	16/0	9/0	3/0	0/0
087	Central Los Angeles	23/0	18/0	25/0	17/0	33/0	25/0	33/0	15/0	10/0	8/0	7/0	5/0	9/0	4/0	7/0	0/0	2/0
090	Santa Clarita Valley	14/0	9/0	9/0	6/0	21/0	7/0	7/0	12/0	16/0	3/0	2/0	2/0	9/0+	4/0	2/0	0/0	0/0
094	Southwest Coastal Los Angeles County 1	21/0	8/0	7/0	12/0	10/0	16/0	14/0	20/0	5/0	13/0*	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	0/0*	0/0	0/0	5/0	0/0	2/0	0/0	0/0
ORANGE COUNTY:																		
3176	Central Orange County	23/2	10/0	18/0	20/0	39/0	13/0	20/0	8/0	10/0	12/0	5/0	13/0	9/0+	5/0	2/0	0/0	3/0
3186	Saddleback Valley 1	18/0	7/0	7/0	10/0	10/0	3/0	--	--	--	--	--	--	--	--	--	--	--
3812	Saddleback Valley 2	--	--	--	--	3/0	3/0	5/0	8/0	4/0	0/0	0/0	2/0	5/0	0/0	2/0	0/0	0/0
RIVERSIDE COUNTY:																		
4137	Coachella Valley 1**	4/0	3/0	2/0	5/0	5/0	0/0	2/0+	5/0	7/0	3/0	3/0	4/0+	11/0	9/0+*	2/0	0/0	0/0+
4144	Metropolitan Riverside County 1	62/7	68/2	70/2	54/0	72/2	70/0	67/0	69/0	57/2	61/0	56/0	60/0	57/0+	41/0	29/0	6/0	13/0
4149	Perris Valley	38/0	33/0	32/0	26/0	50/0	22/0	27/0	39/0	33/0	25/0	32/0	35/0	56/0+	27/0*	16/0	2/0	5/0
4150	San Gorgonio Pass	12/0	19/0	25/0	9/0	--	--	--	--	--	--	--	--	--	--	--	--	--
4155	Norco/Corona	47/3	33/0	42/2	40/0	55/0	48/0	33/0	34/0	26/0	19/0	9/0	18/0	17/0+	15/0	12/0	0/0	3/0
4157	Coachella Valley 2**	44/2	50/0+	43/0+	40/0+	54/0	50/0+	45/0+	45/0+*	42/0+	20/0+*	34/0	50/0+	61/0+	22/0+	8/0+	5/0	2/0+
4163	Temecula Valley	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4164	Banning Airport	--	--	--	4/0	12/0	8/0	13/2	11/0	15/0	12/0	3/0	15/0	15/0	2/0	2/0	2/0	2/0
4165	Mira Loma	--	--	--	--	--	--	--	--	--	--	--	70/0	75/0+	57/0	56/0	42/0	42/0
SAN BERNARDINO COUNTY:																		
5171	Southwest San Bernardino Valley 1	51/5	53/0	36/2	34/0	56/0	--	--	--	--	--	--	--	--	--	--	--	--
5181	Central San Bernardino Mountains	2/0	0/0	0/0	0/0	0/0	0/0	--	19/0	0/0*	2/0	0/0	2/0	4/0	0/0*	2/0	0/0	0/0
5197	Central San Bernardino Valley 1	57/3	57/0	48/0	47/0	61/0	52/0	57/0	53/0	54/0*	48/0	48/0	52/0	59/0+	23/0	22/0	17/0	7/0
5203	Central San Bernardino Valley 2	53/0	58/0	45/0	38/0	56/0	53/0	52/0	56/0	39/0	48/0	38/0	42/0	49/0+	32/0	21/0	5/0	5/0
5204	East San Bernardino Valley	41/2	42/0	38/0	32/0	40/0	44/0	45/0	32/0	26/0	33/0	21/0	20/0	32/0	7/0	3/0	2/0	3/0
5817	Southwest San Bernardino Valley 2	--	--	--	--	67/2	45/0	42/2	41/0	29/0	29/0	32/0	27/0	24/0+	24/0	15/0	5/0	5/0

* Less than 12 full months of data
** Salton Sea Air Basin
+ Excludes data flagged for exceptional events

Federal Reference Method (FRM) filter data only
Refer to 2003 AQMP for 1985-1994 data

TABLE A-8
Particulate Matter (PM10)[#] – Annual Maximum 24-Hour Average (μg/m^3)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
060	East San Gabriel Valley 1	157	100	116	87	103	94	106	91	119	83	76	81	83+	98	74	70	65
069	East San Fernando Valley	135	110	92	75	82	74	86	71	81*	74	92	71	109	66	80	51	61
072	South Coastal Los Angeles County 1	146	113	87	69	79	105	91	74	63	72	66	78	75+	62	62	44	43
077	South Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	83	131	117	123+	81	83	76	50
087	Central Los Angeles	141	138	102	80	88	80	97	65	81	72	70	59	78	66*	72	42	53
090	Santa Clarita Valley	87	91	67	60	75	64	62	61	72	54	55	53	131+	91	56	40	45
094	Southwest Coastal Los Angeles County 1	136	107	79	66	69	74	75	121	58	52*	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	47*	44	45	128	50	52	37	41
ORANGE COUNTY:																		
3176	Central Orange County	172	101	91	81	122	126	93	69	96	74	65	104	75+	61+	63	43	53
3186	Saddleback Valley 1	122	79	86	70	111	60	--	--	--	--	--	--	--	--	--	--	--
3812	Saddleback Valley 2	--	--	--	--	56	98	60	80	64	47	41	57	74	42	56	34	48
RIVERSIDE COUNTY:																		
4137	Coachella Valley 1**	68	130	63	72	104	44	53+	75	108	79	66	73+	83	75+*	140	37	42+
4144	Metropolitan Riverside County 1	219	162	163	116	153	139	136	130	164	137	123	109	118+	115	77	75	82
4149	Perris Valley	145	87	139	98	112	87	86	100	142	83	80	125	120+	85*	80	51	65
4150	San Gorgonio Pass	138	122	227	76	--	--	--	--	--	--	--	--	--	--	--	--	--
4155	Norco/Corona	177	94	158	93	136	129	109+	78	116	76	79	74	93+	86	79	50	60
4157	Coachella Valley 2**	199	117+	144+	114+	119	114+	149+	139+	124+	83+	106	122+	146+	128+	132+	107	106+
4163	Temecula Valley	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4164	Banning Airport	--	--	--	62	86	69	219	70	79	82	76	75	78	51	99	55	51
4165	Mira Loma	--	--	--	--	--	--	--	--	--	--	--	124	142	135	108	89	79
SAN BERNARDINO COUNTY:																		
5171	Southwest San Bernardino Valley 1	167	129	208	92	112	--	--	--	--	--	--	--	--	--	--	--	--
5181	Central San Bernardino Mountains	53	45	47	45	47	49	--	52*	47*	52	49	63	89	41*	57	39	43
5197	Central San Bernardino Valley 1	178	130	122	101	116	108	106	102	101*	106	108	142	111+	75	75	62	84
5203	Central San Bernardino Valley 2	148	136	108	114	134	108	106	94	98	118	72	92	136+	76	66	63	56
5204	East San Bernardino Valley	172	128	103	97	92	109	102	83	92	88	61	103	97	58	52	57	71
5817	Southwest San Bernardino Valley 2	--	--	--	--	--	124	166	91	149	93	74	78	115+	90	70	87	70
	District Maximum	219	162	227	116	153	139	219	139	164	137	131	142+	146+	135	140	107	106

* Less than 12 full months of data.

** Salton Sea Air Basin

\+ Excludes data flagged for exceptional events

\# Federal Reference Method (FRM) filter data only

Refer to 2003 AQMP for 1985-1994 data

TABLE A-9
Fine Particulate Matter (PM2.5)# – Annual Arithmetic Mean (μg/m³)

STN#	LOCATION	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:														
060	East San Gabriel Valley	23.9	20.2	21.7	21.0	19.3	18.3	17.0	15.5	15.9	14.1	13.2	10.9	12.1
069	East San Fernando Valley	22.9	21.4	24.8	24.0	22.1	19.1	17.9	16.6	16.8	14.1	14.4	12.6	13.2
072	South Coastal Los Angeles County 1	20.7	19.6	21.2	19.5	18.0	17.9	16.0	14.2	14.6	14.2	13.0	10.6	11.0
074	West San Fernando Valley	17.3	18.0	18.4	18.9	16.5	15.6	13.9	12.9	13.1	11.9	11.4	10.3	10.2
077	South Coastal Los Angeles County 2	--	--	--	--	20.5	16.5	14.7	14.5	13.7	13.7	12.5	10.4	10.7
084	South Central Los Angeles County1	24.3	23.0	24.5	23.3	20.3	18.5	17.5	16.7	15.9	15.5	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	14.7	12.6	13.0
085	South San Gabriel Valley	25.7	24.0	25.4	24.0	20.6	20.0	17.0	16.7	16.7	15.1	14.8	12.6	12.5
087	Central Los Angeles	23.0	21.9	22.9	22.1	21.4	19.7	18.1	15.6	16.8	15.7	14.3	11.9	13.0
088	West San Gabriel Valley	19.9	19.4	20.9	20.3	18.6	16.6	15.1	13.4	14.3	12.9	12.3	10.4	10.9
ORANGE COUNTY:														
3176	Central Orange County	26.0	20.3	22.0	18.6	17.3	17.0	14.7	14.1	14.5	13.6	11.7	10.2	11.0
3812	Saddleback Valley	16.6	14.7	15.8	15.5	13.1	12.0	10.7	11.0	11.3	10.3	9.4	8.0	8.5
RIVERSIDE COUNTY:														
4137	Coachella Valley 1**	--	9.7	10.7	10.0	9.0	8.9	8.4	7.7	8.7	7.2	6.6	6.0	6.0
4144	Metropolitan Riverside County 1	30.2	28.3	31.0	27.4	24.8	22.1	21.0	19.0	19.1	16.5	15.3	13.2	13.6
4146	Metropolitan Riverside County 2	26.7	25.3	28.2	27.1	22.6	20.8	18.0	17.0	18.1	13.4	13.5	11.1	11.8
4157	Coachella Valley 2**	12.8	11.2	12.2	12.0	11.4	10.7	10.5	9.5	9.8	8.4	8.0	6.9	7.2
4165	Mira Loma	--	--	--	--	--	--	--	20.6	21	18.2	16.8	15.2	15.3
SAN BERNARDINO COUNTY:														
5197	Central San Bernardino Valley 1	25.7	24.5	24.9	24.3	22.1	19.9	18.9	17.6	19	15.4	14.2	12.1	12.6
5203	Central San Bernardino Valley 2	25.6	25.9	26.1	25.8	22.2	21.9	17.4	17.8	18.3	13.5	12.9	11.3	12.2
5817	Southwest San Bernardino Valley	25.4	24.1	26.5	25.4	23.8	20.9	18.8	18.5	17.9	15.6	14.8	12.9	13.2
5818	East San Bernardino Mountains	10.3	10.2	11.2	11.5	10.6	9.7	12.1	11.2	10.4	9.2	9.9	8.5	8.4
	District Maximum	30.2	28.3	31.0	27.4	24.8	22.1	21.0	20.6	21.0	18.2	16.8	15.2	15.3

* Less than 12 full months of data.

** Salton Sea Air Basin

Federal Reference Method (FRM) filter data only

TABLE A-10

Fine Particulate Matter (PM2.5)[#] – Percent of Sampling Days Exceeding the Federal Standard (35 µg/m^3)[##]

STN#	LOCATION	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:														
060	East San Gabriel Valley	17	9	14	12	9	8	6*	3*	7	2	4	1	2
069	East San Fernando Valley	18	14*	16	19	14	10	8	6	9	2	2	1	2
072	South Coastal Los Angeles County 1	9	11*	14	9	7	7	4	2*	4	2	2	0	0
074	West San Fernando Valley	8*	8	7	10	7	4	4	1	1	2	1	1	1
077	South Coastal Los Angeles County 2	--	--	--	--	10	5	2	2	2	2	1	0	1
084	South Central Los Angeles County 1	18	14	16	18	9	7	7	4	4	3	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	3	1	0
085	South San Gabriel Valley	20	13	22	19	9	9	9*	6	5	4	2	0	1
087	Central Los Angeles	15	13	15	13	14	7	7	3	6	3	2	1	1
088	West San Gabriel Valley	9*	6	8	11	10	6	4	1	3	2	3	0	1
ORANGE COUNTY:														
3176	Central Orange County	17	14*	16*	9	7	6	4	2	4	4	1	0	1
3812	Saddleback Valley	4*	4	5	3	3	3	0	1	2	0	1	0	0
RIVERSIDE COUNTY:														
4137	Coachella Valley 1**	--	0	1	1	0	0	0*	0	0	0	0	0	0
4144	Metropolitan Riverside County 1	30	26*	33	25	21	15	11	11	11	4	4	1	1
4146	Metropolitan Riverside County 2	25	22	23	24	19	13	5	9	8	3	2	2	2
4157	Coachella Valley 2**	0*	0	0	0	0	0	2	0	0	0	0	0	0
4165	Mira Loma	--	--	--	--	--	--	--	12	12	9	6	2	3
SAN BERNARDINO COUNTY:														
5197	Central San Bernardino Valley 1	17	19	15	19	14	14	6	6	9	5	2	2	2
5203	Central San Bernardino Valley 2	21	21*	23	24	15	15	3	8	11	3	2	2	2
5817	Southwest San Bernardino Valley	22	14	21	18	17	13	7	7	6	5	3	1	2
5818	East San Bernardino Mountains	--	0	0	0	0	0	4	2*	2	2	2	0	0
	District Maximum	30	22	33	25	21	15	11	12	12	9	6	2	3

* Less than 12 full months of data.

** Salton Sea Air Basin

Federal Reference Method (FRM) filter data only

Effective December 17, 2006, U.S. EPA has strengthen the standard level from 65 µg/m^3 to 35 µg/m^3

TABLE A-11
Fine Particulate Matter (PM2.5)# – Annual Maximum 24-Hour Average (μg/m^3)

STN#	LOCATION	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:														
060	East San Gabriel Valley	81.3	92.5	79.7	72.4	121.2	75.6	132.7*	52.8*	63.8	53.1	72.1	44.4	49.5
069	East San Fernando Valley	79.5	84.4*	94.7	63.0	120.6	60.1	63.2	50.7	56.5	57.5	67.5	43.7	47.8
072	South Coastal Los Angeles County 1	66.9	81.5*	72.9	62.7	115.2	66.6	53.9	58.5*	82.9	57.2	63	35	39.7
074	West San Fernando Valley	79.0*	67.5	71.1	48.8	47.5	56.2	39.6	44.1	43.3	50.5	39.9	40.7	39.8
077	South Coastal Los Angeles County 2	--	--	--	--	--	59.7	50.8	53.6	68	60.9	55.8	33.7	42.0
084	South Central Los Angeles County 1	67.8	82.1	73.1	64.0	54.8	55.8	54.6	55	49	44.2	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	69.2	38.2	35.3
085	South San Gabriel Valley	85.6	89.5	77.3	61.0	90.3	60.7	58.2*	72.2	63.6	47.3	71.1	34.9	41.2
087	Central Los Angeles	69.3	87.8	73.4	66.3	83.7	75.0	73.7	56.2	64.2	78.3	61.7	39.2	49.3
088	West San Gabriel Valley	73.0*	66.3	78.1	57.8	89.0	59.4	62.9	45.9	68.9	66	52	35.2	43.8
ORANGE COUNTY:														
3176	Central Orange County	68.7	113.9*	70.8*	68.6	115.5	58.9	54.7	56.2	79.4	67.9	64.6	31.7	39.2
3812	Saddleback Valley	56.6*	94.7	53.4	58.5	50.6	49.4	35.4	47	46.9	32.6	39.2	19.9	33.4
RIVERSIDE COUNTY:														
4137	Coachella Valley 1**	--	28.5	44.7	42.3	21.2	27.1	26.2*	24.8	32.5	18.1	21.8	12.8	26.3
4144	Metropolitan Riverside County 1	111.2	119.6*	98.0	77.6	104.3	91.7	98.7	68.5	75.7	57.7	54.5	46.5	60.8
4146	Metropolitan Riverside County 2	90.0	79.3	74.9	75.5	73.3	93.8	95.0	55.3	68.6	43	42.2	43.7	51.6
4157	Coachella Valley 2**	29.6*	28.6	33.5	26.8	26.8	28.5	44.4	24.3	26.8	21.6	27.5	16.0	35.4
4165	Mira Loma	--	--	--	--	--	--	--	63.0	69.7	50.9	49.2	54.2	56.3
SAN BERNARDINO COUNTY:														
5197	Central San Bernardino Valley 1	98.0	72.9	74.8	66.6	98.1	71.4	96.8	52.6	77.5	49	46.4	42.6	60.1
5203	Central San Bernardino Valley 2	121.5	89.8*	78.5	82.1	73.9	93.4	106.3	55	72.1	43.5	37.8	39.3	65.0
5817	Southwest San Bernardino Valley	85.8	73.4	71.2	64.8	88.9	86.1	87.8	53.7	72.8	54.2	46.9	46.1	52.9
5818	East San Bernardino Mountains	32.1	29.0	34.6	34.1	35.0	28.6	38.8	40.1*	45.4	36.8	40.8	35.4	30.6
	District Maximum	121.5	119.6	98.0	82.1	121.2	93.8	132.7	72.2	82.9	78.3	72.1	54.2	60.8

* Less than 12 full months of data.

** Salton Sea Air Basin

Federal Reference Method (FRM) filter data only

TABLE A-12
Fine Particulate Matter (PM2.5)# – Annual 24-Hour Average 98th Percentile Concentration (μg/m³)

STN#	LOCATION	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:														
060	East San Gabriel Valley	64	62	61	51	56	54	53	39	49	35	43	35	31
069	East San Fernando Valley	50	83	69	55	60	49	51	43	48	35	34	33	34
072	South Coastal Los Angeles County 1	51	64	49	47	47	46	41	35	41	36	34	28	28
074	West San Fernando Valley	40	50	57	45	45	53	36	32	33	26	27	30	24
077	South Coastal Los Angeles County 2	--	--	--	--	53	42	38	35	34	35	30	27	27
084	South Central Los Angeles County1	53	63	66	53	52	53	48	45	46	37	--	--	--
112	South Cenral Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	38	32	32
085	South San Gabriel Valley	60	71	67	58	50	52	54	43	50	38	35	32	32
087	Central Los Angeles	52	73	58	55	61	50	53	39	51	40	34	27	32
088	West San Gabriel Valley	60	54	55	49	48	47	43	32	45	32	36	25	26
ORANGE COUNTY:														
3176	Central Orange County	66	66	59	48	52	48	42	41	47	39	32	25	28
3812	Saddleback Valley	45	37	46	46	38	39	31	26	35	27	24	17	29
RIVERSIDE COUNTY:														
4137	Coachella Valley 1**		23	33	23	20	23	25	16	21	17	15	13	13
4144	Metropolitan Riverside County 1	79	77	74	66	77	60	58	54	54	41	40	32	31
4146	Metropolitan Riverside County 2	62	67	66	64	56	54	41	48	57	39	34	27	28
4157	Coachella Valley 2**	30	26	30	22	25	27	25	19	27	19	17	12	16
4165	Mira Loma	--	--	--	--	--	--	--	53	60	47	41	36	37
SAN BERNARDINO COUNTY:														
5197	Central San Bernardino Valley 1	66	65	70	57	54	63	48	44	65	47	33	31	28
5203	Central San Bernardino Valley 2	72	70	68	66	58	72	43	48	68	41	35	30	33
5817	Southwest San Bernardino Valley	86	65	65	57	67	60	50	42	53	45	36	31	35
5818	East San Bernardino Mountains	31	27	30	32	29	23	37	40	34	33	29	28	31
	District Maximum	86	83	74	66	77	72	58	54	68	47	43	36	37

* Less than 12 full months of data.

** Salton Sea Air Basin

\# Federal Reference Method (FRM) filter data only

TABLE A-13
Carbon Monoxide – Annual Maximum 8-Hour Average (ppm)
(To Be Compared to Federal Standard (9 ppm) and State Standard (9.0 ppm), 8-Hour Average)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
060	East San Gabriel Valley 1	6.3	4.0	4.3	3.9	3.9	4.9	2.9	2.4	2.6	2	1.7	1.7	1.8	1.6	1.7	1.3	1.4
069	East San Fernando Valley	12.0	9.3	7.4	7.5	9.0	6.1	4.9	4.6	4.7*	3.7	3.4	3.5	2.8	2.6	2.9	2.4	2.4
072	South Coastal Los Angeles County 1	6.6	6.9	6.7	6.6	5.4	5.8	4.7	4.6	4.7	3.4	3.5	3.4	2.6	2.6	2.2	2.1	2.6
033	South Coastal Los Angeles County 3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.3
074	West San Fernando Valley	10.3	8.5	9.8	9.3	7.6	9.8	6.0	4.8	4.1	3.5	3.5	3.4	2.8	2.9	2.8	2.6	2.8
075	Pomona/Walnut Valley	6.1	5.0	5.0	7.3	6.7	4.9	3.4	3.3	4.4	3.1	2.5	2.1	2	2	1.8	1.8	1.6
084	South Central Los Angeles County 1	13.86	17.3	17.0	13.4	11.0	10.0	7.7	10.1	7.3	6.7	5.9	6.4	5.1	4.3*	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.6	3.6	4.7
085	South San Gabriel Valley	7.86	8.1	6.2	6.1	5.6	5.3	4.0	4	4	3.6	2.4*	2.7*	2.9	2.1	2.1	1.9	2.4
087	Central Los Angeles	8.37	8.4	7.9	6.1	6.3	6.0	4.6	4	4.6	3.2	3.1	2.6	2.2	2.1	2.2	2.3	2.4
088	West San Gabriel Valley	9.12	7.1	6.0	6.3	6.6	7.4	5.0	4	3.8	3.4	2.8	2.8	2.3	2.1	2.1	2	2.2
090	Santa Clarita Valley	4.12	3.9	6.8	3.4	3.6	4.9	3.1	1.9	1.7	3.7	1.3	1.3	1.2	1.1	1.4	1.1	0.8
091	Northwest Coastal Los Angeles County	5.62	4.5	4.4	4.5	3.8	4.3	3.0	2.7	2.7	2.3	2.1	2	2	2	1.5	1.4	1.6
094	Southwest Coastal Los Angeles County 1	8.86	11.6	10.3	9.4	8.4	7.0	5.1	6.1	5	4.4*	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	3.0*	2.1	2.3	2.4	2.5	1.9	2.2	1.8
591	East San Gabriel Valley 2	--	--	--	--	--	3.1	2.5--	2.3	2.1	2	1.9	2	2	3	2.1	1.3	1.1
ORANGE COUNTY:																		
3176	Central Orange County	8.00	7.5	5.8	5.3	5.3	6.8	4.7	5.4	3.9	4.1	3.3	3	2.9	3.6	2.7	2	2.1
3177	North Orange County	6.62	6.9	6.0	6.1	5.3	6.1	4.7	4.4	4.1	4	3.1	3	2.9	2.9	2.3	1.8	2.1
3186	Saddleback Valley 1	4.00	4.0	3.6	3.1	2.5	2.3	--	--	--	--	--	--	--	--	--	--	--
3195	North Coastal Orange County	6.57	7.3	5.8	7.0	6.4	6.3	4.6	4.3	5.8	4.1	3.2	3	3.1	2	2.2	2.1	2.2
3812	Saddleback Valley 2	--	--	--	--	--	3.3	2.4	3.6	1.8	1.6	1.6	1.8	2.2	1.1	1	0.9	1
RIVERSIDE COUNTY:																		
4137	Coachella Valley 1**	1.50	1.6	1.4	1.6	1.8	1.6	1.5	1.2	1.3*	1	0.8	1	0.8	0.6	0.7	0.5	0.6
4144	Metropolitan Riverside County 1	5.71	5.0	5.8	4.6	4.4	4.3	3.4	3	3.7	3	2.5	2.1	2.9	2	1.9	1.8	1.4
4146	Metropolitan Riverside County 2	6.50	5.4	5.0	4.6	4.1	4.3	4.5	3.9	3.4	2.1	2.4	2.3	2.1	2	1.8	1.7	1.5
4157	Coachella Valley 2**	--	--	--	--	--	2.1	--	--	--	--	--	--	--	--	--	--	--
4158	Lake Elsinore	--	--	--	--	--	2.0	2.0	2	1.3*	0.9	1	1	1.4	1	0.7	0.6	0.7
4165	Mira Loma	--	--	--	--	--	--	--	--	--	--	--	2.7	2.1	1.9	2.4	1.9	1.9
SAN BERNARDINO COUNTY:																		
5175	Northwest San Bernardino Valley	--	--	--	--	--	2.6	1.8	1.6	2.9	2.1	1.8	1.8	1.7	1.6	1.5	1.8	1.3
5197	Central San Bernardino Valley 1	--	--	--	--	--	--	--	--	--	2.1*	2.1	2	1.8	1.9	1.5	1.4	1.1
5203	Central San Bernardino Valley 2	6.3	4.6	6.0	4.6	4.0	4.3	3.3	3.3	4.6	3.3	2.4	2.3	2.3	1.8	1.9	1.7	1.7
	District Maximum	13.9	17.3	17.0	13.5	11.7	10.0	7.7	10.1	7.3	6.7	5.9	6.4	5.1	4.3	4.6	3.6	4.7

* Less than 12 full months of data.
** Salton Sea Air Basin
Refer to 2003 AQMP for 1976-1994 data

TABLE A-14
Nitrogen Dioxide – Annual Average (pphm)
(To Be Compared to Federal Standard (5.34 pphm) and State Standard (3.0 pphm), Annual Average of All Hours)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
060	East San Gabriel Valley 1	4.64	4.15	3.38	3.64	3.90	3.66	3.31	3.36	2.96	2.04	2.51	2.58	2.53	2.3	1.94	1.85	1.9
069	East San Fernando Valley	4.54	4.61	4.24	4.16	4.56	4.15	4.19	4.02	3.56*	3.32	2.94	2.74	2.89	2.85	2.74	2.41	2.21
072	South Coastal Los Angeles County 1	3.67	3.42	3.33	3.39	3.42	3.13	3.08	2.98	2.88*	2.80	2.41	2.15	2.07	2.08	2.12	1.98	1.77
033	South Coastal Los Angeles County 3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	21.2
074	West San Fernando Valley	3.17	3.07	2.60	2.66	2.87	2.85	2.66	2.48	2.6*	2.14	2.02	1.74	1.86	1.8	1.71	1.67	1.49
075	Pomona/Walnut Valley	4.56	4.26	4.33	4.33	5.03	4.35	3.71	3.65	3.52	3.14	3.12	3.07	3.18	3.02	2.74	2.62	2.46
084	South Central Los Angeles County 1	4.63	4.12	4.28	3.93	4.28	3.86	3.69	3.57	3.12	3.01	--	3.06	2.91	3.01*	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.14	1.79	1.86
085	South San Gabriel Valley	4.56	3.93	3.63	3.69	3.91	3.66	3.52	3.44	3.53	3.05	3.12	2.83*	2.49	2.63	2.59	2.29	2.37
087	Central Los Angeles	4.50	4.36	4.30	3.98	3.91	4.04	3.78	3.27	3.38	3.28	3.08*	2.88	2.99	2.75	2.81	2.5	2.31
088	West San Gabriel Valley	3.75	3.78	3.41	3.51	3.79	2.96	3.45	3.35	3.22	2.70	2.78	2.45	2.46	2.35	2.21	1.96	2.03
090	Santa Clarita Valley	3.05	--	--	--	2.84	2.46	2.39	2.00	2.21	2.04	2.41	1.84	1.96	1.65	1.51	1.43	1.33
091	Northwest Coastal Los Angeles County	2.78	2.89	2.85	2.71	2.91	2.73	2.51	2.49	2.31	1.98	1.90	1.73	2	1.84	1.7	1.56	1.39
094	Southwest Coastal Los Angeles County 1	3.05	2.85	2.80	2.95	2.95	2.75	2.50	2.44*	2.38	3.10*	1.78	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	1.36*	1.34	1.55	1.4	1.43	1.59	1.21	1.34
591	East San Gabriel Valley 2	3.80	3.28	3.00	2.76	3.28	2.90	2.74	2.72	2.71	2.40	2.24	2.06	2.27	1.82	1.7	1.54	1.29
ORANGE COUNTY:																		
3176	Central Orange County	3.71	3.19	3.32	3.36	3.27	3.00	2.93*	2.44	2.40	1.99	2.11	1.97	2.08	2.03	1.79	1.75	1.68
3177	North Orange County	3.91	3.54	3.29	3.44	3.51	3.04	2.75	2.56	2.84	2.52	2.49	2.24	2.19	2.06	2.06	2.01	1.77
3195	North Coastal Orange County	2.39	2.06	1.99	2.00	2.09	2.05	1.82	1.87	1.99	1.51	1.31	1.45	1.32	1.32	1.3	1.13	1.00
RIVERSIDE COUNTY:																		
4137	Coachella Valley 1**	2.23	2.10	1.58	1.70	1.95	1.78	1.75	1.72	1.73*	1.30	1.20	1.03	1.03	0.93	0.81	0.85	0.8
4144	Metropolitan Riverside County 1	3.06	2.94	2.62	2.25	2.25	2.36	2.47	2.37	2.17	1.72	2.22	1.99	2.06	1.92	1.71	1.68	1.66
4146	Metropolitan Riverside County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	2.58*	2	1.72	1.69
4157	Coachella Valley 2**	--	--	--	--	--	0.99	--	--	--	--	--	--	--	--	--	--	--
4158	Lake Elsinore	2.08	1.82	1.65	1.74	2.00	1.75	1.85	1.73	1.82*	1.51	1.42	1.51	1.74	1.29	1.29	1.01	0.96
4164	Banning Airport	--	--	--	2.15	2.43	2.37	2.11	1.99	1.93*	1.65	1.48	1.61	1.47	1.28	1.09	1.16	0.95
4165	Mira LOma	--	--	--	--	--	--	--	--	--	--	--	1.94	1.81	1.74	1.58	1.51	1.53
SAN BERNARDINO COUNTY:																		
5175	Northwest San Bernardino Valley	4.64	3.87	3.41	3.59	3.98	3.80	3.84	3.69	3.49	3.05	3.13	3.1	2.76	2.35	2.39	2.04	1.96
5197	Central San Bernardino Valley 1	4.24	3.86	3.65	3.62	3.88	3.64	3.58	3.34*	3.07	2.73	3.10	2.7	2.39	2.07	2.35	2.31	2.11
5203	Central San Bernardino Valley 2	4.04	3.84	3.53	3.39	3.58	3.25	3.03	2.96	2.70	2.61	2.59	2.52	2.45	2.17	1.96	1.88	1.69
	District Maximum	4.64	4.61	4.33	4.33	5.03	4.35	4.19	4.02	3.56	3.32	3.13	3.10	3.18	3.02	2.81	2.62	2.46

* Less than 12 full months of data. ** Salton Sea Air Basin Refer to 2003 AQMP for 1976-1994 data

TABLE A-15
Nitrogen Dioxide – Annual Maximum 1-Hour Average (ppm)
(To Be Compared to Federal Standard (0.100 ppm) and State Standard (0.18 ppm), 1-Hour Average)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
060	East San Gabriel Valley 1	0.22	0.15	0.16	0.14	0.16	0.15	0.12	0.12	0.12	0.10	0.09	0.11	0.12	0.10	0.10	0.077	0.080
069	East San Fernando Valley	0.18	0.20	0.20	0.14	0.18	0.17	0.25	0.26	0.14	0.12	0.09	0.10	0.09	0.11	0.09	0.082	0.068
072	South Coastal Los Angeles County 1	0.21	0.17	0.20	0.16	0.15	0.14	0.13	0.13	0.14	0.12	0.14	0.10	0.11	0.13	0.11	0.093	0.106
033	South Coastal Los Angeles County 3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.090
074	West San Fernando Valley	0.14	0.16	0.20	0.14	0.12	0.11	0.09	0.09	0.13	0.08	0.09	0.07	0.08	0.09	0.07	0.075	0.056
075	Pomona/Walnut Valley	0.18	0.18	0.15	0.15	0.16	0.14	0.13	0.11	0.12	0.11	0.08	0.10	0.10	0.11	0.10	0.097	0.087
084	South Central Los Angeles County 1	0.21	0.25	0.20	0.16	0.18	0.14	0.15	0.14	0.13	0.10	0.11	0.14	0.10	0.12*	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.09	0.077	0.075
085	South San Gabriel Valley	0.23	0.17	0.15	0.14	0.16	0.14	0.14	0.12	0.14	0.12	0.09	0.10*	0.11	0.10	0.10	0.079	0.091
087	Central Los Angeles	0.24	0.25	0.20	0.17	0.21	0.16	0.14	0.14	0.16	0.16	0.13	0.11	0.10	0.12	0.12	0.089	0.110
088	West San Gabriel Valley	0.22	0.19	0.17	0.16	0.16	0.17	0.15	0.15	0.14	0.12	0.10	0.12	0.09	0.11	0.08	0.071	0.087
090	Santa Clarita Valley	0.16	--	--	--	0.10	0.10	0.10	0.10	0.12	0.09	0.09	0.08	0.08	0.07	0.06	0.059	0.060
091	Northwest Coastal Los Angeles County	0.20	0.18	0.14	0.13	0.13	0.16	0.11	0.11	0.12	0.09	0.08	0.08	0.08	0.09	0.08	0.071	0.081
094	Southwest Coastal Los Angeles County 1	0.18	0.15	0.17	0.15	0.13	0.13	0.11	0.10	0.12	0.08	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	0.09*	0.09	0.10	0.08	0.09	0.08	0.076	0.098
591	East San Gabriel Valley 2	0.20	0.14	0.13	0.13	0.14	0.13	0.12	0.10	0.12	0.12	0.09	0.10	0.11	0.10	0.09	0.079	0.078
ORANGE COUNTY:																		
3176	Central Orange County	0.18	0.15	0.10	0.13	0.12	0.13	0.12	0.10	0.13	0.12	0.09	0.11	0.10	0.09	0.07	0.073	0.074
3177	North Orange County	0.20	0.16	0.15	0.13	0.16	0.12	0.13	0.12	0.16	0.12	0.09	0.09	0.08	0.08	0.10	0.083	0.070
3195	North Coastal Orange County	0.18	0.14	0.12	0.12	0.12	0.11	0.08	0.11	0.11	0.10	0.09	0.10	0.07	0.08	0.07	0.070	0.061
RIVERSIDE COUNTY:																		
4137	Coachella Valley 1**	0.09	0.08	0.07	0.07	0.07	0.07	0.08	0.10	0.06	0.07	0.10	0.09	0.06	0.05	0.05	0.046	0.045
4144	Metropolitan Riverside County 1	0.15	0.11	0.12	0.10	0.13	0.10	0.15	0.10	0.09	0.09	0.08	0.08	0.07	0.09	0.08	0.065	0.063
4146	Metropolitan Riverside County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	0.09*	0.08	0.061	0.057
4157	Coachella Valley 2**	--	--	--	--	--	0.06	--	--	--	--	--	--	--	--	--	--	--
4158	Lake Elsinore	0.21	0.10	0.11	0.09	0.11	0.08	0.09	0.07	0.08	0.06	0.07	0.07	0.06	0.06	0.06	0.051	0.050
4164	Banning Airport	--	--	--	0.26	0.31	0.21	0.24	0.15	0.09	0.08	0.07	0.11	0.08	0.08	0.06	0.066	0.061
4165	Mira Loma	--	--	--	--	--	--	--	--	--	--	--	0.08	0.07	0.10	0.08	0.062	0.059
SAN BERNARDINO COUNTY:																		
5175	Northwest San Bernardino Valley	0.20	0.15	0.15	0.14	0.13	0.15	0.13	0.12	0.11	0.11	0.10	0.10	0.10	0.09	0.11	0.079	0.069
5197	Central San Bernardino Valley 1	0.17	0.17	0.14	0.15	0.15	0.12	0.13	0.12*	0.12	0.06	0.10	0.09	0.09	0.10	0.11	0.072	0.076
5203	Central San Bernardino Valley 2	0.16	0.15	0.14	0.11	0.14	0.10	0.11	0.11	0.10	0.12	0.0.08	0.09	0.08	0.09	0.08	0.069	0.062
	District Maximum	0.24	0.25	0.2	0.26	0.31	0.21	0.25	0.26	0.16	0.16	0.14	0.14	0.12	0.13	0.12	0.097	0.110

* Less than 12 full months of data. ** Salton Sea Air Basin Refer to 2003 AQMP for 1976-1994 data

TABLE A-16
Sulfur Dioxide – Annual Maximum 1-Hour Average (ppm)
(To Be Compared to Federal Standard (0.075 ppm) and State Standard (0.25 ppm), 1-Hour Average)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
60	East San Gabriel Valley 1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
69	East San Fernando Valley	0.01	0.01	0.04	0.01	0.01	0.01	0.01	0.01	0.01*	0.02	0.01	0.01	0.01	0.01	0.01	0.015	0.009
72	South Coastal Los Angeles County 1	0.14	0.04	0.04	0.08	0.05	0.05	0.05	0.03	0.03	0.04	0.04	0.03	0.11	0.09	0.02	0.040	0.015
33	South Coastal Los Angeles County 3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.043
74	West San Fernando Valley	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
84	South Central Los Angeles County	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
85	South San Gabriel Valley	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
87	Central Los Angeles	0.01	0.01	0.02	0.14	0.05	0.08	0.03	0.02	0.05*	0.08	0.07	0.03	0.01	0.01	0.01	0.010	0.020
88	West San Gabriel Valley	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
90	Santa Clarita Valley	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
91	Northwest Coastal Los Angeles County	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
94	Southwest Coastal Los Angeles County 1	0.06	0.06	0.1	0.03	0.09	0.17	0.04	0.07	0.03	0.03*	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	0.02*	0.04	0.02	0.02	0.02	0.02	0.026	0.012
ORANGE COUNTY:																		
3176	Central Orange County	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3177	North Orange County	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3195	North Coastal Orange County	0.02	0.01	0.03	0.02	0.02	0.02	0.01	0.03	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.010	0.008
RIVERSIDE COUNTY:																		
4144	Metropolitan Riverside County	0.01	0.01	0.04	0.03	0.03	0.11	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.018	0.051
SAN BERNARDINO COUNTY:																		
5175	Northwest San Bernardino Valley	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5197	Central San Bernardino Valley 1	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.03*	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.007	0.012
5203	Central San Bernardino Valley 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	District Maximum	0.14	0.06	0.1	0.14	0.09	0.17	0.05	0.07	0.05	0.08	0.07	0.03	0.11	0.09	0.02	0.04	0.051

* Less than 12 full months of data.
** Salton Sea Air Basin
Refer to 2003 AQMP for 1976-1994 data

TABLE A-17
Sulfate (PM10) – Annual Maximum 24-Hour Average (μg/m^3)
(To Be Compared to State Standard of 25 μg/m^3, 24-Hour Average)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
60	East San Gabriel Valley 1	12.7	11.9	12.9	10.5	16.9	14.3	12.7	12.3	13.1	10.8	10.8	17.0	34.2	17.3	7.3	7.3	6.6
69	East San Fernando Valley	14.9	12.0	14.7	9.8	11.4	15.7	14.6	12.2	15.3	11.0	11.8	13.3	10.2	10.8	8.8	8.0	7.4
72	South Coastal Los Angeles County 1	18.2	14.9	11.3	12.8	13.1	11.9	15.0	14.4	15.6	14.7	10.8	16.5	10.3	9.7	9.5	10.0	6.1
77	South Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	15.0	15.9	13.5	17.9	8.4	11.0	7.3	12.6	5.9
87	Central Los Angeles	16.2	14.7	16.2	10.3	16.7	14.6	16.2	13.5	14.5	10.5	11.7	13.1	9.4	12.7	9.5	7.5	8.0
89	Santa Clarita Valley 1	11.2	8.4	10.4	7.2	17.3	--	--	--	--	--	--	--	--	--	--	--	--
90	Santa Clarita Valley 2	--	--	--	--	--	--	9.2	9.2	11.2	8.9	9.3	8.8	9.2	6.7	6.0	6.9	6.1
94	Southwest Coastal Los Angeles County1	18.1	16.1	15.3	11.6	17.6	--	--	--	--	--	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	12.6	11.0	12.4	10.7	13.4	8.4	8.5	5.9
ORANGE COUNTY:																		
3176	Central Orange County	14.5	17.3	14.7	12.9	9.6	--	9.9	11.8	11.3	12.2	9.0	12.8	12.1	8.7	7.6	6.6	6.5
3186	Saddleback Valley 1	12.3	15.1	14.2	9.1	8.8	--	--	--	--	--	--	--	--	--	--	--	--
3812	Saddleback Valley 2	--	--	--	--	8.6	12.3	10.1	10.9	10.5	9.2	9.2	9.4	8.8	6.8	6.1	7.4	4.8
RIVERSIDE COUNTY:																		
4137	Coachella Valley 1**	6.8	5.7	5.9	5.5	5.4	6.2	6.0	5.3	6.5	5.2	5.5	4.9	5.8	5.2	4.8	5.1	4.4
4144	Metropolitan Riverside County 1	22.3	14.9	14.8	10.0	11.1	10.7	11.3	10.5	12.4	24.8	10.5	10.9	13.7	7.3	8.3	7.2	5.3
4149	Perris Valley	13.5	8.0	9.1	7.9	8.7	7.4	8.3	7.9	6.9	7.8	7.7	9.0	10.1	6.5	6.3	5.8	4.4
4150	San Gorgonio Pass	7.3	8.5	8.7	6.5	2.7	--	--	--	--	--	--	--	--	--	--	--	--
4155	Norco/Corona	13.6	11.3	13.1	9.8	10.1	11.0	10.2	10.5	9.9	10.1	7.1	10.7	18.9	13.4	10.7	7.0	5.1
4157	Coachella Valley 2**	10.4	6.7	5.8	5.4	4.9	6.9	7.5	7.2	6.2	6.7	6.1	5.4	5.2	5.6	5.1	4.8	5.7
4164	Banning Airport				6.1	4.6	6.9	6.4	8.0	5.8	6.7	7.1	7.5	6.2	6.3	5.4	5.5	4.4
4165	Mira Loma Van Buren	--	--	--	--	--	--	--	--	--	--	--	10.1	19.6	8.6	5.9	5.3	5.4
SAN BERNARDINO COUNTY:																		
5181	Central San Bernardino Mountains	4.8	5.2	4.7	4.5	3.0	5.1	5.2	4.0	3.7	4.7	5.9	4.2	3.9	4.4	3.9	4.7	4.0
5197	Central San Bernardino Valley 1	14.2	11.0	11.2	9.8	11.6	11.6	11.3	11.6	12.4	10.2	9.0	11.7	22.2	8.9	6.1	6.2	6.0
5203	Central San Bernardino Valley 2	11.9	11.6	9.2	13.1	10.8	10.6	10.3	10.8	11.4	10.4	9.3	10.0	9.7	8.3	5.6	6.6	5.5
5204	East San Bernardino Valley	11.3	9.9	8.8	9.6	9.8	10.2	9.0	9.7	9.0	10.5	8.6	11.7	11.3	7.4	5.4	6.6	4.9
5817	Southwest San Bernardino Valley	--	--	--	4.6	10.1	10.2	11.4	10.7	11.0	11.1	9.3	11.2	22.8	12.4	7.0	7.3	5.5
	District Maximum	22.3	17.3	16.2	13.1	17.6	15.7	16.2	14.4	15.6	24.8	13.5	17.9	34.2	17.3	10.7	12.6	8.0

* Less than 12 full months of data.
** Salton Sea Air Basin
Refer to 2003 AQMP for 1976-1994 data

TABLE A-18
Lead (TSP) – Annual Maximum Calendar Quarter Mean (µg/m^3)
(To Be Compared to Former Federal Standard of 1.5 µg/m^3, Calendar Quarter Average)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
69	East San Fernando Valley	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
72	South Coastal Los Angeles County 1	0.04	0.08	0.03	0.04	0.05	0.04	0.04	0.02	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
77	South Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01
84	South Central Los Angeles County 1	0.06	0.05	0.07	0.04	0.09	0.06	0.10	0.04	0.04	0.03	0.02	0.02	0.03	0.02*	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	0.01*	0.02	0.01	0.01
85	South San Gabriel Valley	0.06	0.06	0.06	0.05	0.09	0.06	0.05	0.05	0.04	0.02	0.03	0.02	0.02	0.02	0.02	0.01	0.01
87	Central Los Angeles	0.06	0.06	0.07	0.04	0.07	0.05	0.05	0.03	0.03	0.03	0.02	0.01	0.03	0.02	0.01	0.01	0.01
94	Southwest Coastal Los Angeles County	0.04	0.03	0.05	0.04	0.04	0.05	0.04	0.02	0.03	0.01	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County	--	--	--	--	--	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01
LOS ANGELES COUNTY (Source-Specific):																		
	Van Nuys Airport, Van Nuys	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.03	0.04
	Trojan Battery, Santa Fe Springs	--	--	--	--	--	--	--	--	--	--	--	--	--	0.08	0.10	0.07	0.08
	Quemetco, City of Industry	--	--	--	--	--	--	--	--	--	--	--	--	--	0.06*	0.10	0.10	0.06
	Exide (Rehrig), Vernon	--	--	--	--	--	--	--	--	--	--	--	--	--	2.41	0.48	0.39	0.45
	Exide (ATSF), Vernon	--	--	--	--	--	--	--	--	--	--	--	0.21	0.52	0.22	0.08	0.05	0.06
	Exide (Ayers St.), Vernon	--	--	--	--	--	--	--	--	--	--	--	--	--	0.03	0.02	0.02	--
ORANGE COUNTY:																		
3176	Central Orange County	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RIVERSIDE COUNTY:																		
4144	Metropolitan Riverside County 1	0.04	0.04	0.04	0.04	0.05	0.05	0.03	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
4146	Metropolitan Riverside County 2	0.03	0.03	0.04	0.05	0.04	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
SAN BERNARDINO COUNTY:																		
5175	Northwest San Bernardino Valley	0.04	0.04	0.04	0.04	0.05	0.05	0.04	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
5203	Central San Bernardino Valley	0.04	0.04	0.04	0.03	0.05	0.05	0.04	0.02	0.08	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01
	District Maximum	0.06	0.08	0.07	0.05	0.09	0.06	0.10	0.05	0.08	0.03	0.03	0.21	0.52	2.41	0.48	0.39	0.45

* Less than 12 full months of data.

Refer to 2003 AQMP for 1976-1994 data

TABLE A-19
Lead (TSP) – Annual Maximum Monthly Average (µg/m^3)
(To Be Compared to State Standard of 1.5 µg/m^3, Monthly Average)

STN# LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																	
69 East San Fernando Valley	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
72 South Coastal Los Angeles County 1	0.05	0.09	0.05	0.07	0.06	0.05	0.05	0.03	0.10	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01
77 South Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	0.02	0.02	0.01	0.02	0.01	0.02	0.01	0.01
84 South Central Los Angeles County 1	0.06	0.09	0.07	0.04	0.17	0.09	0.23	0.04	0.04	0.03	0.03	0.02	0.03	0.03	--	--	--
112 South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.03	0.01	0.01
85 South San Gabriel Valley	0.07	0.09	0.08	0.07	0.21	0.09	0.07	0.06	0.05	0.03	0.03*	0.03	0.04	0.02	0.04	0.02	0.01
87 Central Los Angeles	0.07	0.08	0.07	0.06	0.13	0.06	0.06	0.05	0.15	0.03	0.03	0.02	0.04	0.02	0.02	0.01	0.01
94 Southwest Coastal Los Angeles County	0.04	0.04	0.06	0.06	0.05	0.08	0.04	0.02	0.17	0.01	--	--	--	--	--	--	--
820 Southwest Coastal Los Angeles County	--	--	--	--	--	--	--	--	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
LOS ANGELES COUNTY (Source-Specific):																	
Van Nuys Airport, Van Nuys	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.06
Trojan Battery, Santa Fe Springs	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	0.15	0.08	0.12
Quemetco, City of Industry	--	--	--	--	0.28	0.44	0.46	0.15	0.18	0.13	0.38	0.10	--	0.06*	0.11	0.12	0.07
Exide (Rehrig), Vernon	--	--	--	--	--	--	--	--	--	--	--	--	1.97*	2.88	0.80	0.48	0.54
Exide (ATSF), Vernon	--	--	--	--	--	--	--	--	--	--	--	0.23	1.01	0.25	0.09	0.08	0.07
Exide (Ayers St.), Vernon	--	--	--	--	--	--	--	--	--	--	--	--	--	0.04*	0.03	0.02	--
ORANGE COUNTY:																	
3176 Central Orange County	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RIVERSIDE COUNTY:																	
4144 Metropolitan Riverside County 1	0.04	0.08	0.07	0.08	0.06	0.06	0.04	0.03	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01
4146 Metropolitan Riverside County 2	0.05	0.05	0.07	0.10	0.05	0.04	0.03	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
SAN BERNARDINO COUNTY:	0.05	0.04	0.04	0.05	0.07	0.07	0.05	0.02	0.08	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01
5175 Northwest San Bernardino Valley	0.05	0.06	0.04	0.05	0.07	0.06	0.05	0.03	0.14	0.02	0.02	0.03	0.04	0.02	0.01	0.01	0.01
5203 Central San Bernardino Valley	0.07	0.09	0.08	0.10	0.28	0.44	0.46	0.15	0.18	0.13	0.38	0.23	1.01	2.88	0.80	0.48	0.54
District Maximum	0.07	0.09	0.08	0.10	0.21	0.09	0.23	0.06	0.17	0.03	0.03	0.28	0.23	1.97	2.88	0.80	0.45

* Less than 12 full months of data.

Refer to 2003 AQMP for 1976-1994 data

TABLE A-20
Lead (TSP) – Annual Maximum 3-Month Rolling Average (µg/m³)
(To Be Used for Comparison to Federal Standard of 0.15 µg/m³, 3-Month Rolling Average)

STN#	LOCATION	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
LOS ANGELES COUNTY:																		
69	East San Fernando Valley	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
72	South Coastal Los Angeles County 1	0.04	0.04	0.04	0.04	0.05	0.05	0.04	0.03	0.04	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01
77	South Coastal Los Angeles County 2	--	--	--	--	--	--	--	--	--	0.06	0.01	0.01	0.01	0.01	0.01	0.01	0.01
84	South Central Los Angeles County 1	0.05	0.07	0.07	0.05	0.09	0.07	0.11	0.04	0.04	0.03	0.03	0.02	0.03	0.03	--	--	--
112	South Central Los Angeles County 2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.02	0.01	0.01
85	South San Gabriel Valley	0.06	0.06	0.07	0.06	0.10	0.08	0.05	0.05	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.01	0.01
87	Central Los Angeles	0.06	0.06	0.07	0.05	0.07	0.05	0.05	0.04	0.06	0.06	0.02	0.01	0.03	0.02	0.02	0.01	0.01
94	Southwest Coastal Los Angeles County	0.04	0.04	0.05	0.05	0.04	0.05	0.04	0.03	0.07	0.07	--	--	--	--	--	--	--
820	Southwest Coastal Los Angeles County	--	--	--	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
LOS ANGELES COUNTY (Source-Specific):																		
	Van Nuys Airport, Van Nuys	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.04
	Trojan Battery, Santa Fe Springs	--	--	--	--	--	--	--	--	--	--	--	--	--	0.08	0.12	0.07	0.11
	Quemetco, City of Industry	--	--	--	--	0.22	0.37	0.33	0.12	0.15	0.11	0.22	0.09	--	--	0.10	0.10	0.06
	Exide (Rehrig), Vernon	--	--	--	--	--	--	--	--	--	--	--	--	--	2.49	0.66	0.39	0.46
	Exide (ATSF), Vernon	--	--	--	--	--	--	--	--	--	--	--	0.21	0.55	0.22	0.08	0.05	0.06
	Exide (Ayers St.), Vernon	--	--	--	--	--	--	--	--	--	--	--	--	--	0.03	0.02	0.02	--
ORANGE COUNTY:																		
3176	Central Orange County	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RIVERSIDE COUNTY:																		
4144	Metropolitan Riverside County 1	0.04	0.05	0.04	0.05	0.05	0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.03	0.01	0.01
4146	Metropolitan Riverside County 2	0.03	0.03	0.05	0.06	0.04	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
SAN BERNARDINO COUNTY:																		
5175	Northwest San Bernardino Valley	0.04	0.04	0.04	0.04	0.05	0.05	0.04	0.02	0.04	0.03	0.02	0.01	0.02	0.01	0.01	0.01	0.01
5203	Central San Bernardino Valley	0.04	0.05	0.03	0.04	0.05	0.05	0.05	0.03	0.08	0.07	0.01	0.02	0.02	0.02	0.01	0.01	0.01
	District Maximum	0.06	0.07	0.07	0.06	0.22	0.37	0.33	0.12	0.15	0.11	0.22	0.21	0.55	2.49	0.66	0.39	0.46

* Less than 12 full months of data.

Refer to 2003 AQMP for 1976-1994 data