CHAPTER 2

LOCAL AIR QUALITY

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2. LOCAL AIR QUALITY

2.1 INTRODUCTION

This chapter provides the background for this 2004 Plan by presenting an overview of the climate of Santa Barbara County, an assessment of local air quality trends using ARB-specified indicators and a discussion of the impacts our air quality has on neighboring air districts. The description of the climate of Santa Barbara County is important for understanding the factors that influence air quality in the county, while the air quality indicator data are important for assessing progress towards attainment of state ozone standards. The discussion on air pollution transport summarizes the status of the California Air Resources Board (ARB) efforts to re-assess the impacts that our air quality has on neighboring air districts.

The next section of this chapter, Section 2.2, discusses the local climate of Santa Barbara County and the relationship of the climate to air quality. Santa Barbara County's air quality monitoring network is described in Section 2.3. A summary of state ozone exceedances experienced in the county from 1988 through 2003 are highlighted in Section 2.4 while Section 2.5 summarizes air quality trends using air quality indicators. Section 2.6 discusses the State Designation Value and its relation to the air quality indicators. Section 2.7 details air quality transport and the ARB assessment of the potential impacts of the transport of emissions generated in Santa Barbara County. Finally, Section 2.8 highlights the conclusions of this chapter. For clarity, all tables and figures associated with this chapter will appear after the conclusions.

2.2 CLIMATE OF SANTA BARBARA COUNTY

Santa Barbara County's air quality is influenced by both local topography and meteorological conditions. Surface and upper-level wind flow varies both seasonally and geographically in the county and inversion conditions common to the area can affect the vertical mixing and dispersion of pollutants. The prevailing wind flow patterns in the county are not necessarily those that cause high ozone values. In fact, high ozone values are often associated with atypical wind flow patterns. Meteorological and topographical influences that are important to air quality in Santa Barbara County are as follows:

- Semi-permanent high pressure that lies off the Pacific Coast leads to limited rainfall (around 18 inches per year), with warm, dry summers and relatively damp winters. Maximum summer temperatures average about 70 degrees Fahrenheit near the coast and in the high 80s to 90s inland. During winter, average minimum temperatures range from the 40s along the coast to the 30s inland. Additionally, cool, humid, marine air causes frequent fog and low clouds along the coast, generally during the night and morning hours in the late spring and early summer. The fog and low clouds can persist for several days until broken up by a change in the weather pattern.

- In the northern portion of the county (north of the ridgeline of the Santa Ynez Mountains), the sea breeze (from sea to land) is typically northwesterly throughout the year while the prevailing sea breeze in the southern portion of the county is from the southwest. During summer, these winds are stronger and persist later into the night. At night, the sea breeze weakens and is replaced by light land breezes (from land to sea). The alternation of the land-sea breeze cycle can sometimes produce a "sloshing" effect, where pollutants are swept offshore at night and subsequently carried back onshore during the day. This effect is exacerbated during periods when wind speeds are low.

- The terrain around Point Conception, combined with the change in orientation of the coastline from north-south to east-west can cause counterclockwise circulation (eddies) to form east of the Point. These eddies fluctuate temporally and spatially, often leading to highly variable winds along the southern coastal strip. Point Conception also marks the change in the prevailing surface winds from northwesterly to southwesterly.

- Santa Ana winds are northeasterly winds that occur primarily during fall and winter, but occasionally in spring. These are warm, dry winds blown from the high inland desert that descend down the slopes of a mountain range. Wind speeds associated with Santa Ana's are generally 15-20 mph, though they can sometimes reach speeds in excess of 60 mph. During Santa Ana conditions, pollutants emitted in Santa Barbara, Ventura County, and the South Coast Air Basin (the Los Angeles region) are moved out to sea. These pollutants can then be moved back onshore into Santa Barbara County in what is called a "post-Santa Ana condition." The effects of the post-Santa Ana condition can be experienced throughout the county. Not all post-Santa Ana conditions, however, lead to high pollutant concentrations in Santa Barbara County.

- Upper-level winds (measured at Vandenberg Air Force Base once each morning and afternoon) are generally from the north or northwest throughout the year, but occurrences of southerly and easterly winds do occur in winter, especially during the morning. Upper-level winds from the south and east are infrequent during the summer. When they do occur, they are usually associated with periods of high ozone levels. Surface and upper-level winds can move pollutants that originate in other areas into the county.

- Surface temperature inversions (0-500 ft) are most frequent during the winter, and subsidence inversions (1000-2000 ft) are most frequent during the summer. Inversions are an increase in temperature with height and are directly related to the stability of the atmosphere. Inversions act as a cap to the pollutants that are emitted below or within them and ozone concentrations are often higher directly below the base of elevated inversions than they are at the earth's surface. For this reason, elevated monitoring sites will occasionally record higher ozone concentrations than sites at lower elevations. Generally, the lower the inversion base height and the greater the rate of temperature increase from the base to the top, the more pronounced effect the inversion will have on inhibiting vertical dispersion. The subsidence inversion is very common during summer along the California coast, and is one of the principal causes of air stagnation.

- Poor air quality is usually associated with "air stagnation" (high stability/restricted air movement). Therefore, it is reasonable to expect a higher frequency of pollution events in the southern portion of the county where light winds are frequently observed, as opposed to the northern part of the county where the prevailing winds are usually strong and persistent.

2.3 AIR QUALITY MONITORING

Both the federal and state Clean Air Acts identify pollutants of specific importance, which are known as criteria pollutants. Ambient air quality standards are adopted by the ARB and the USEPA to protect public health, vegetation, materials and visibility (Table 2-1). State standards for ozone and both respirable (less than 10 microns -PM_{10}) and fine (less than 2.5 microns – $PM_{2.5}$) particles are more stringent than federal standards.

Monitoring of ambient air pollutant concentrations is conducted by the ARB, APCD and industry. Monitors operated by the ARB and APCD are part of the State and Local Air Monitoring System (SLAMS). The SLAMS stations are located to provide local and regional air quality information. Monitors operated by industry, at the direction of the APCD, are called Prevention of Significant Deterioration (PSD) stations. PSD stations are required by the APCD to ensure that new and modified sources under APCD permit do not interfere with the county's ability to attain or maintain air quality standards. Figure 2-1 shows the locations of all monitoring stations in Santa Barbara County that are currently in operation.

2.4 STATE OZONE EXCEEDANCES

Figure 2-2a presents the number of state ozone exceedances in Santa Barbara County during the period of 1988 to 2004. As shown in the figure, Santa Barbara County has experienced between 2 and 42 days per year on which the state ozone standard was exceeded in the county.

The most striking feature of Figure 2-2a is the dramatic decrease in the number of state ozone exceedances since 1988, when the county experienced 42 days where the state standard was exceeded. In contrast, there were only two days where the state ozone standard was exceeded during 2004. A clear declining trend in the number of state ozone exceedances is evident from 1988 through 1999. Since 1999, with the relatively low number of state 1-hour ozone exceedances experienced in Santa Barbara County, the trend is less discernable.

The long-term declining trend in exceedance days has occurred concurrently with increases in both population and daily vehicle miles traveled in Santa Barbara County (Figure 2-2b). This shows that local, state and federal emission reduction programs have been effective in improving air quality in Santa Barbara County despite significant increases in population and vehicle miles traveled.

2.5 AIR QUALITY INDICATORS

The California Clean Air Act (CCAA) requires the ARB to evaluate and identify three air quality related indicators for districts to use in assessing their progress toward attainment of the State standards [Health and Safety Code section 39607(f)]. Districts are required to assess their progress triennially and report to the ARB as part of the triennial plan revisions. The assessment must address (1) the peak concentrations in the peak "hot spot" sub-area, (2) the population-weighted average of the total exposure, and (3) the area-weighted average of the total exposure (ARB Resolution 90-96, November 8, 1990).

2.5.1 Peak Concentration Indicators

As mentioned above, the ARB specifies the use of three air quality indicators to assess progress toward attaining the state 1-hour ozone standard: peak "hot spot" indicator, population-weighted exposure, and area-weighted exposure. These data were provided to us by the ARB on August 28, 2003, with the recommendation that we report improvement in air quality using the

Expected Peak Day Concentration (EPDC), and two exposure indicators (population-weighted and area-weighted). 2003 exposure data are currently not available for trend analyses.

The peak "hot spot" indicator is assessed in terms of the EPDC. The EPDC is provided to districts by the ARB for each monitoring site in the county and represents the maximum ozone concentration expected to occur once per year, on average. The EPDC is useful for tracking air quality progress at individual monitoring stations since it is relatively stable, thereby providing a trend indicator that is not highly influenced by year-to-year changes in weather. Simply, progress means the change or improvement in air quality over time that can be attributed to a reduction in emissions rather than the influence of other factors, such as variable weather. The EPDC is also used in the area designation process, which is described in Section 2.6.

The EPDC is calculated using ozone data for a three-year period (the summary year and the two years proceeding the summary year). For example, the 2002 EPDC for a monitoring site uses data from 2000, 2001 and 2002. The data that are used in the calculation are the daily maximum one-hour concentrations. The EPDC is calculated using a complex statistical procedure that analytically determines for each monitoring site the concentration that is expected to recur at a rate of once per year.

Figure 2-3 presents 1988 through 2003 peak air quality indicators for monitoring sites in Santa Barbara County. Note that data collection on Santa Rosa Island did not begin until 1996, thus EPDC indicator data for that site does not start until 1998. Additionally, Santa Barbara data terminate in 2000 since the station was offline for several months during 2001, but came back online at the beginning of 2003. West Campus data end in 1998 when ozone data collected terminated at that site.

Figure 2-3 shows that peak air quality indicators have declined significantly from 1988 levels at all monitoring stations. 1999 EPDC values (based on 1997, 1998 and 1999 ozone data) fell below the State standard at the GTC-B, Santa Ynez, El Capitan, Goleta, Lompoc HS&P and Santa Barbara sites. The Carpinteria EPDC indicator dropped below the State ozone standard in 2002 from earlier levels that were significantly above the standard. Additionally, the peak indicator~~s~~ for the Las Flores Canyon~~,~~ site fell below the state standard in 2003. The Paradise Road monitoring site, while showing considerable improvement from earlier years, had an EPDC value~~s~~ that remained above the standard during 2003.

As discussed previously, the ARB requires that district's assess the peak "hot spot" subareas as one method of determining progress toward meeting State air quality standards. Since 1988, both the Paradise Road and Las Flores Canyon monitoring sites have experienced the most State ozone exceedances in the county, and therefore can be considered hot spot locations (see Table 2-2). The Las Flores Canyon monitoring site had a maximum of 24 exceedances in 1990 with no exceedances during 2002, while the number of State exceedances at the Paradise Road site has ranged from 24 in 1988 to zero exceedances during 2000.

The EPDC indicators have improved significantly from earlier levels at both the Las Flores Canyon and Paradise Road sites. The EPDC indicator was as high as 0.140 ppm during 1989 and 1990 at the Las Flores Canyon site decreasing to 0.092 ppm during 2003. At the Paradise Road site, the peak indicator was as high as 0.125 ppm in 1989 and 1991, decreasing to 0.105 ppm by 2003. Figure 2-4 presents the overall EPDC trend improvement for both the Las Flores Canyon and Paradise Road sites from 1988 to 2003. Based on the trendline, the overall EPDC improvement for the Las Flores Canyon site from 1989 to 2003 is about 35%. The Paradise Road EPDC trend improvement is about 20% for the period of 1988 to 2003.

In addition to assessing the longer-term trends, the ARB recommends that districts evaluate changes in the EPDC indicator for the most recent three years of data and report any improvement for those years. Between 2000 and 2003, the EPDC for the Las Flores Canyon site decreased from 0.102 to 0.092 ppm, which translates to an improvement of about 7%. The Paradise Road site EPDC dropped from 0.103 ppm to 0.100 ppm between 2000 and 2001 then increased back to 0.105 during 2003. Peak indicators at other monitoring sites in Santa Barbara County have also generally decreased between 2000 and 2002, although the El Capitan site EPCD increased from 0.082 ppm to 0.086 ppm between 2000 and 2001 then decreased to 0.084 ppm in 2002.

The reduction in EPDC indicator data show that Santa Barbara County's air quality has improved significantly over the long-term. There have also been continued improvements at several of the monitoring sites in the county, although the overall trend of countywide exceedances has been less distinct over the last few years. Air quality improvement has led to the reduction in the number of State ozone exceedances from 42 days in 1988 to as few as two days in 2004.

2.5.2 Population and Area Exposure Indicators

Population and area exposure indicators are intended to provide an indication of the potential for chronic adverse health impacts. Unlike the EPDC that tracks air quality progress at individual monitoring sites, the population- and area-weighted exposure indicators consolidate hourly ozone monitoring data from all sites within the county into a single exposure value. The result is a value representing the average potential exposure in an area.

The population exposure indicator is based on the annual number of hours that ozone levels were above the state standard. The exposure values are allocated to population on the basis of census tracts and the distance of the various tracts to the air monitoring stations. The population-weighted exposure indicators represent a composite of exposures at individual locations that have been weighted to emphasize equally the potential exposure for each individual in an area.

The area-weighted exposure value is similar to the population exposure except that it is based on the area within each census tract rather than the population in each tract. The area-weighted exposure indicator represents a composite of exposures at individual locations that have been weighted to emphasize equally the potential exposure in all portions of the county.

Population- and area-weighted trends are presented in Figure 2-5a and 2-5b. These figures show that both exposure indicators have decreased over time since 1988 (with the exception of 1989) and that indicator values have been very low during the last few years due to dramatic improvement in air quality. It should be noted that high values during 1989, shown as spikes in the trend data, are due to two specific ozone episodes in March and April of that year where ozone concentrations were significantly higher than both federal and state standards. Due to spikes in the data during 1989, exposure trend data for 1990 to 2000 are presented in a separate figure (Figure 2-5b) with a more suitable scale to better display trends during that period. These trends in the population- and area-weighted exposure data suggest that even with population growth and natural fluctuations in weather, air quality has improved significantly since 1988.

2.6 DESIGNATION VALUE

Designation values (DV) are used to determine whether an area is in or out of attainment of applicable air quality standards. The designation value refers to the highest measured concentration remaining at a given site after all measured concentrations affected by extreme concentration events are excluded. In the area designation process, measured concentrations that are higher than the calculated EPDC are identified as being affected by an extreme concentration event (weather conditions conducive to high concentrations of ozone) and are not considered violations of the State standard. If the highest designation value within an area does not exceed the State standard, then the area can be considered in attainment for that pollutant. For example, if the calculated EPDC for a site is 0.096 parts per million (ppm) and the four highest measured ozone concentrations are 0.125, 0.113, 0.102 and 0.094 ppm, then the designation value is equal to 0.10 ppm.. This is because the EPDC of 0.096 is first rounded to 0.10 to be consistent with the precision of the State standard, which is two decimal places, and 0.10 is the highest concentration measured (0.102 rounds down to 0.10) that is equal to or lower than the rounded EPDC. The concentrations of 0.125 ppm (rounded to 0.13 ppm) and 0.113 ppm (rounded to 0.11 ppm) are higher than the rounded EPDC of 0.10 and are excluded as an extreme concentrations and are not considered as the DV.

DV data for the period of 1988-2003 for Las Flores Canyon, Carpinteria and Paradise Road, sites historically measuring the most ozone exceedances, are presented in Figure 2-6. Based on these data, only the Paradise Road site remained out of compliance with the State ozone standard during 2003.

2.7 TRANSPORT IMPACTS

The State Act gives ARB the responsibility to assess the movement of air pollutants from one air basin to another (referred to as “transport”) and the relative impacts on ozone concentrations. The ARB must also establish mitigation requirements commensurate with the level of contribution an upwind area has on a downwind area. While Section 2.2 discussed the impacts of pollution transported from the South Coast Air Basin on Santa Barbara County, this section summarizes the status of ARB’s efforts to re-assess the impacts that our air quality has on neighboring air districts.

The ARB staff assesses transport impacts by first identifying “transport couples” that consist of an upwind area and a corresponding downwind area. These areas are generally defined using air basin boundaries or portions thereof. Areas with similar geographic and weather conditions are within the same air basin. Santa Barbara County is part of the South Central Coast Air Basin, which also includes San Luis Obispo County and Ventura County. The greater Los Angeles area is in the South Coast Air Basin. In addition to identifying upwind and downwind relationships between air basins, the ARB is required to assess the degree of impact. State law directs the ARB to determine if the contribution of transported pollution is overwhelming, significant, inconsequential, or some combination.

The ARB determined through modeling of ozone episodes that occurred in the mid-1980’s that under some conditions emissions generated in the South Central Coast Air Basin can contribute to ozone exceedances occurring in the South Coast Air Basin. This led the ARB to classify the South Central Coast Air Basin (excluding San Luis Obispo) as both a significant and an inconsequential contributor to South Coast Air Basin ozone exceedances.

Recently, the ARB performed analyses of state ozone exceedances in the northwestern portion of the South Coast Air Basin to determine whether emissions from the South Central Coast Air Basin, particularly emissions generated in Santa Barbara and Ventura Counties, continue to contribute to exceedances in the South Coast Air Basin. The ARB examined all exceedances that occurred between 2000 and 2003 at monitoring sites located in Reseda and Santa Clarita, northwest of downtown Los Angeles. In all, there were 263 State 1-hour ozone exceedances between these two sites. Due to the large number of exceedance days, it was not possible for the ARB to do an in-depth analysis of each day. Therefore, the ARB used a screening approach to identify days that had the potential for transport from the Santa Barbara area to the eastern South Coast Air Basin.

The ARB utilized two methods to screen potential Santa Barbara County to Reseda/Santa Clarita transport days, and then applied a trajectory model to those days where screening showed a potential for transport. The first method for screening exceedances was the evaluation of weather conditions to determine if winds were conducive to transport. Secondly, ozone, NOx and CO concentrations were plotted along with hourly wind speed and direction for a 48-hour period to determine whether pollutants were transported into the Reseda/Santa Clara area overnight or whether they were carried over from the day prior to the exceedance day. After screening, a total of 14 exceedance days were evaluated with a trajectory model.

While none of the trajectories backed into the urban Santa Barbara area, a few did back over the Santa Barbara Channel and into the vicinity of Vandenberg Air Force Base. Emissions from the Vandenberg area are a small fraction of overall county emissions, however, and are unlikely to be sufficient enough to contribute to ozone exceedances in the Santa Clarita and Reseda areas. Chapter 7 includes a more detailed explanation of the methodology used by the ARB to determine Santa Barbara County's transport contributions.

The ARB's analyses suggest that there was a low potential for transport of ozone or ozone precursors from Santa Barbara County into the Santa Clarita and Reseda area during the period of 2000 through 2003 that could have contributed to any of the 263 state ozone exceedances. The ARB has concluded, therefore, that transport from Santa Barbara County into the South Coast has been inconsequential.

2.8 CONCLUSIONS

Although Santa Barbara County continues to violate the State ozone standard of 0.09 parts per million, long-term EPDC indicator trend and exposure data show that air quality has improved dramatically since 1988.   Since 1999, with the relatively low number of State 1-hour ozone exceecdances experienced in Santa Barbara County, the trend is less discernable. As a result of overall trend improvement, however, the EPDC has decreased below the State ozone standard at several sites within the county since 1988. This improvement in air quality has decreased the number of days experiencing State ozone exceedances from 42 in 1988 to just 2 in 2004.

The improvement in air quality is not only beneficial to Santa Barbara County, but may also reduce our impact on neighboring counties. Since 1993, the South Central Coast Air Basin, of which Santa Barbara is part of, has been classified by the ARB as both a significant and inconsequential contributor to State ozone exceedances occurring in the neighboring South Coast Air Basin.   The ARB has recently performed updated analyses of exceedance days in the South Coast Air Basin between 2000 and 2003 and found that the contribution of ozone and ozone precursors from Santa Barbara County to each of the exceedances was inconsequential.

Table 2-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]	National Standards[2]	
		Concentration[3]	Primary[2, 4]	Secondary[2, 5]
Ozone	1 Hour	0.09 ppm (180 ug/m^3)	0.12 ppm (235 ug/m^3)	Same as Primary
	8 Hour	--	0.08 ppm (157 ug/m^3)	Same as Primary
Carbon Monoxide	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	Same as Primary
	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
Nitrogen Dioxide	Annual Average	--	0.053 ppm (100 ug/m^3)	Same as Primary
	1 Hour	0.25 ppm (470 ug/m^3)	--	
Sulfur Dioxide	Annual Average	--	0.03 ppm (80 ug/m^3)	
	24 Hour	0.04 ppm[6] (105 ug/m^3)	0.14 ppm (365 ug/m^3)	--
	3 Hour	--	--	0.5 ppm (1,300 ug/m^3)
	1 Hour	0.25 ppm (655 ug/m^3)	--	--
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 ug/m^3	50 ug/m^3	--
	24 Hour	50 ug/m^3	150 ug/m^3	Same as Primary
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 ug/m^3	15 ug/m^3	Same as Primary
	24 Hour	--	65 ug/m^3	Same as Primary
Sulfates	24 Hour	25 ug/m^3		--
Lead	30 Day Average	1.5 ug/m^3	--	--
	Calendar Quarter	--	1.5 ug/m^3	Same as Primary
Hydrogen Sulfide	1 Hour	0.03 ppm (42 ug/m^3)		--
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm (26 ug/m^3)		--
Visibility Reducing Particles	1 Observation	In sufficient amount to reduce the prevailing visibility[7] to less than 10 miles when the relative humidity is less than 70%		--

Table 2-1 (Concluded)

NOTES:

1. California standards for ozone, carbon monoxide, sulfur dioxide (1 hour), nitrogen dioxide and particulate matter - PM_{10}, and visibility reducing particles are values that are not to be exceeded. The sulfur dioxide (24-hour), sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded.

2. National standards, other than ozone and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parenthesis are based upon a reference temperature of 25^oC and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25^oC and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the Environmental Protection Agency.

5. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the implementation plan is approved by the EPA.

6. At locations where the state standards for ozone and/or suspended particulate matter are violated. National standards apply elsewhere.

7. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range when relative humidity is less than 70 percent.

Table 2-2
Number of Days Exceeding State Ozone Standard by Site
1988-2003

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Carpinteria	10	14	5	8	9	6	11	7	8	4	3	1	1	1	0	1
El Capitan	0	3	2	2	6	3	2	5	4	0	1	0	0	0	0	1
Goleta	5	6	5	5	8	5	3	3	5	0	1	1	0	0	0	1
Najoqui	4	5	4	7	5	5	2	3	5	1	0	0	1	0	0	1
Las Flores Canyon	10	23	24	12	15	9	15	15	14	5	5	1	4	1	0	1
Lompoc HS&P	4	5	1	3	1	3	1	1	3	0	1	0	1	0	0	1
Lompoc H Street	1	1	0	1	1	1	1	2	0	0	0	0	0	0	0	0
Paradise Road	24	20	10	22	12	7	5	6	10	3	11	3	0	4	3	6
Santa Ynez	3	6	0	3	4	1	1	1	4	1	2	0	0	1	0	0
VAFB STS	0	3	3	2	1	1	0	1	2	0	0	1	0	0	0	0

Figure 2-1
Santa Barbara County Air Quality Monitoring Stations

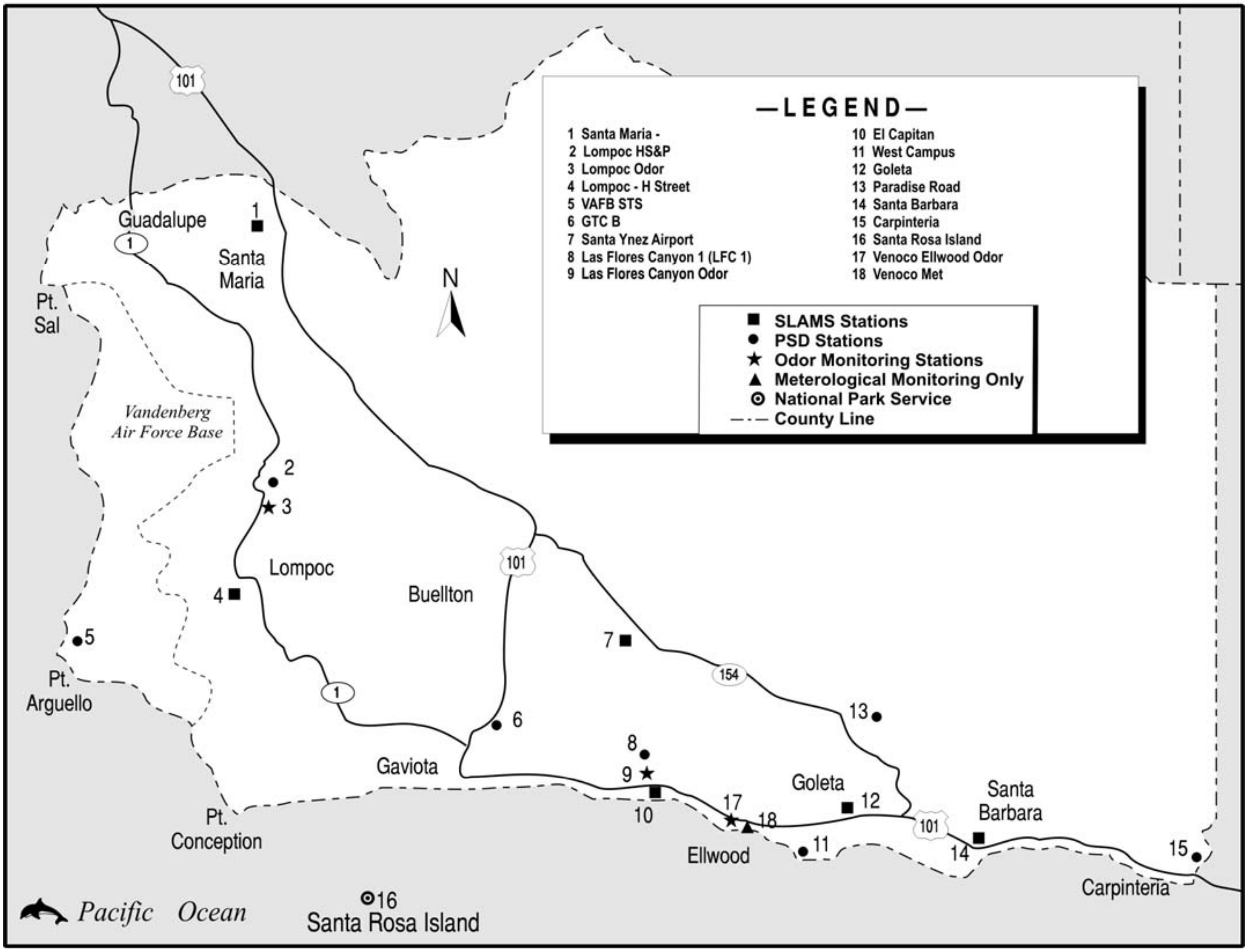
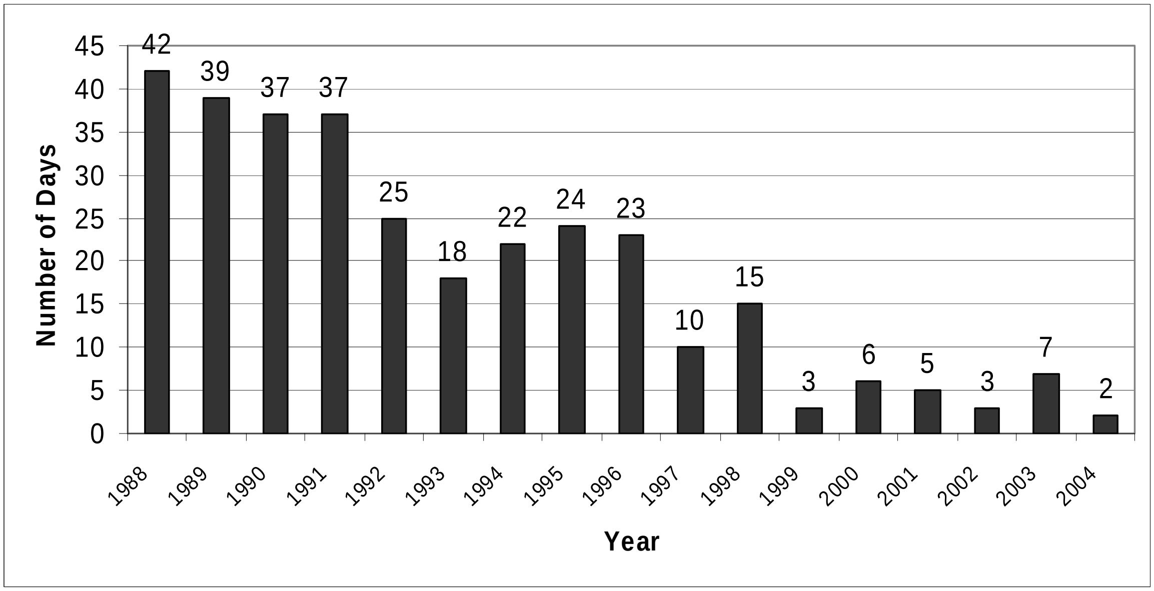


Figure 2-2a
Number of Days Exceeding State Ozone Standard
Santa Barbara County
1988-2004*



*2004 data are preliminary

Figure 2-2b
Population and Daily Vehicle Miles Traveled
Santa Barbara County
1988-2002

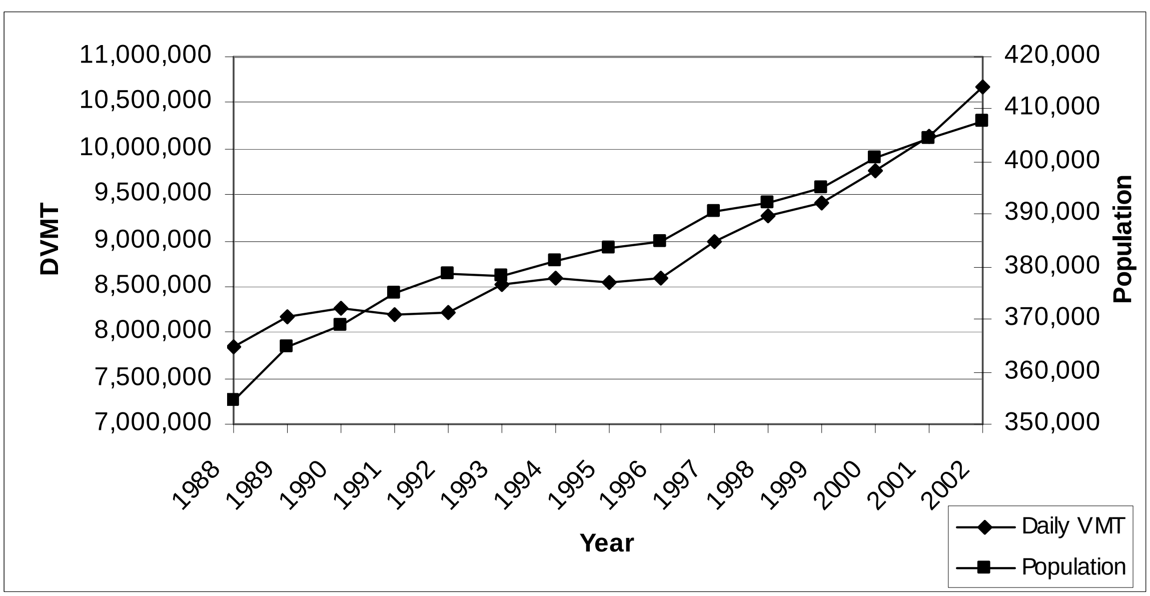
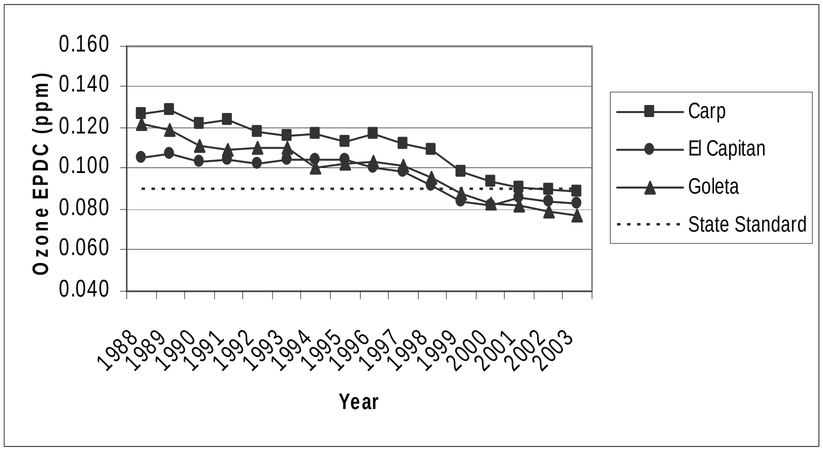
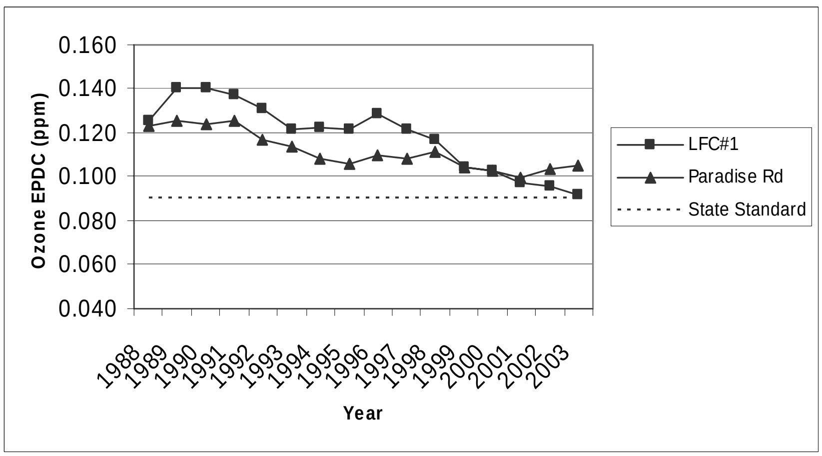


Figure 2-3
State Ozone Expected Peak Day Concentration
Santa Barbara County Monitoring Sites
1988-2003





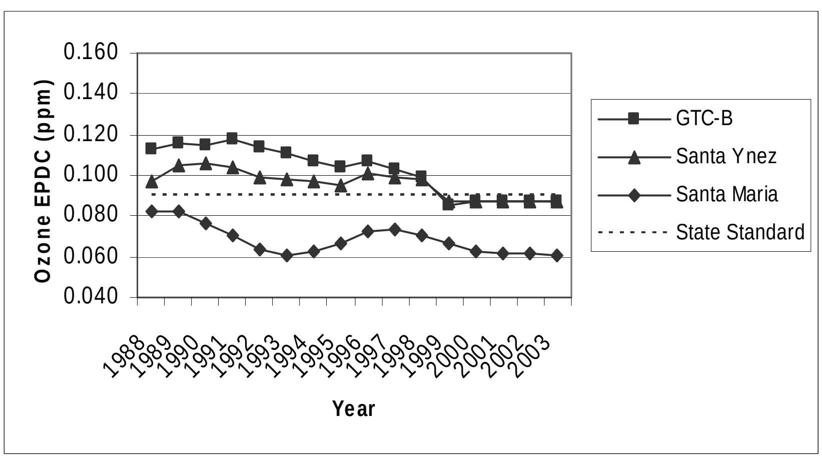
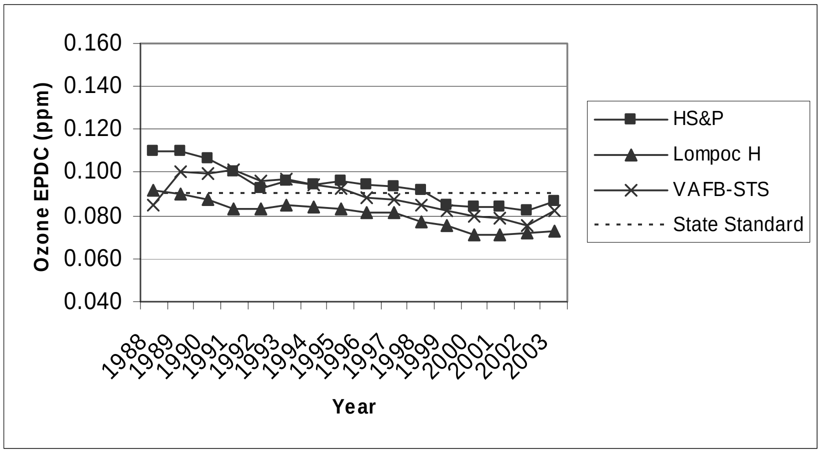


Figure 2-3 Concluded
State Ozone Expected Peak Day Concentration
Santa Barbara County Monitoring Sites
1988-2003



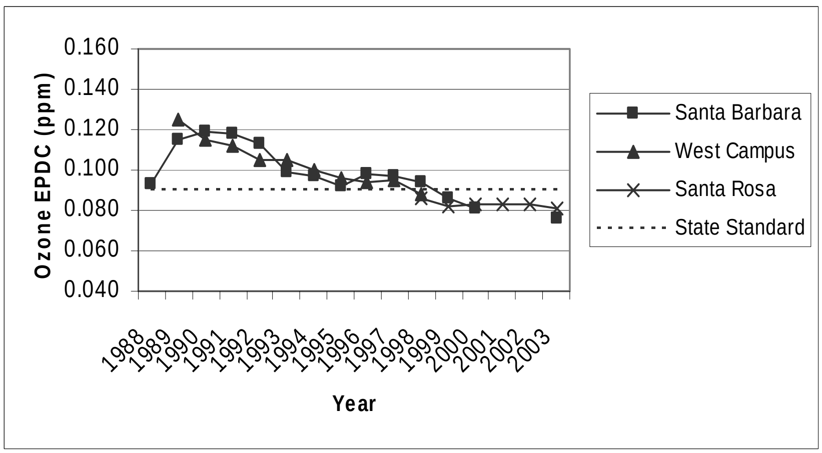
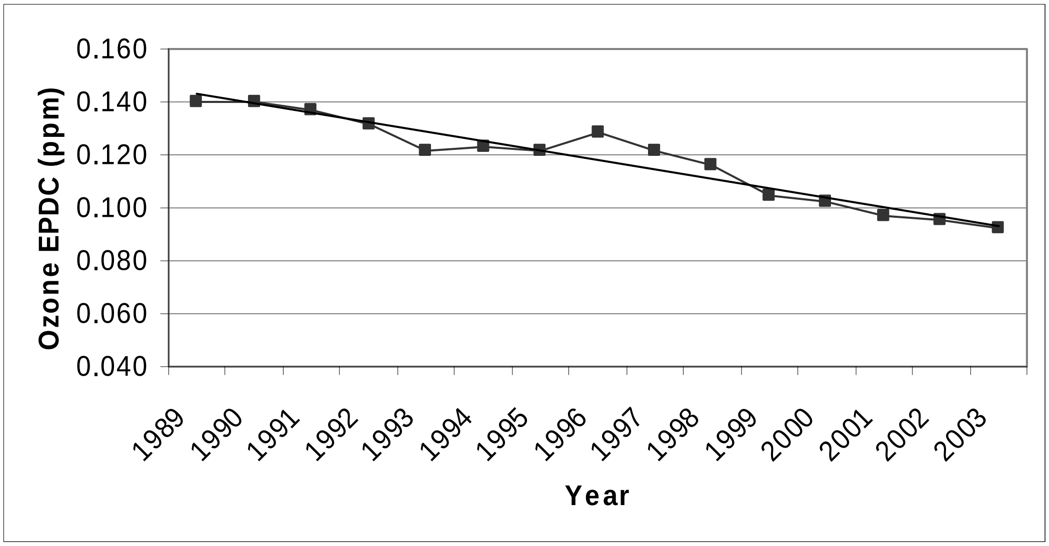


Figure 2-4
Peak "Hot Spot" EPDC Trends
1988-2003

Las Flores Canyon



Paradise Road

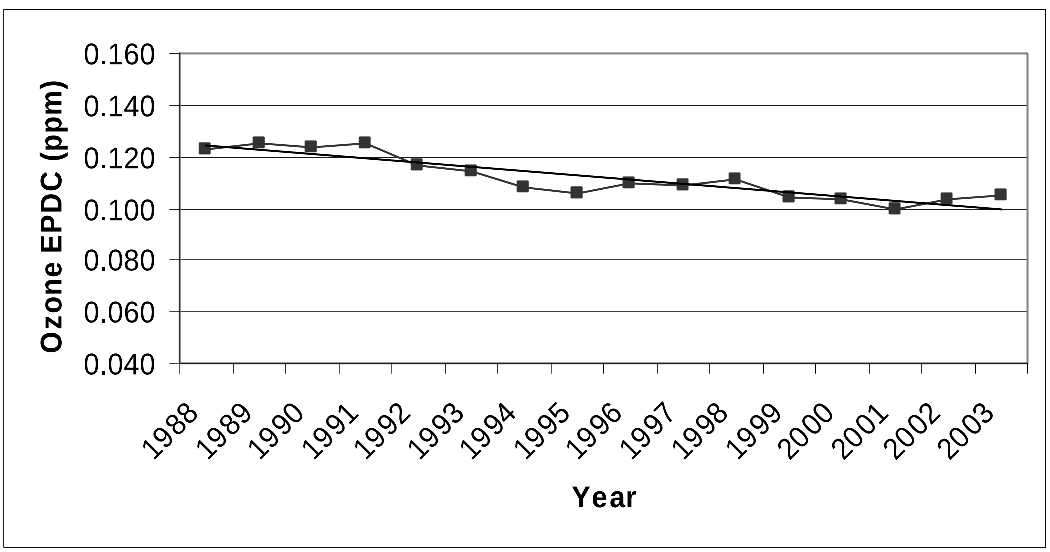


Figure 2-5a
Population- and Area-Weighted Exposure
Santa Barbara County
1988-2002

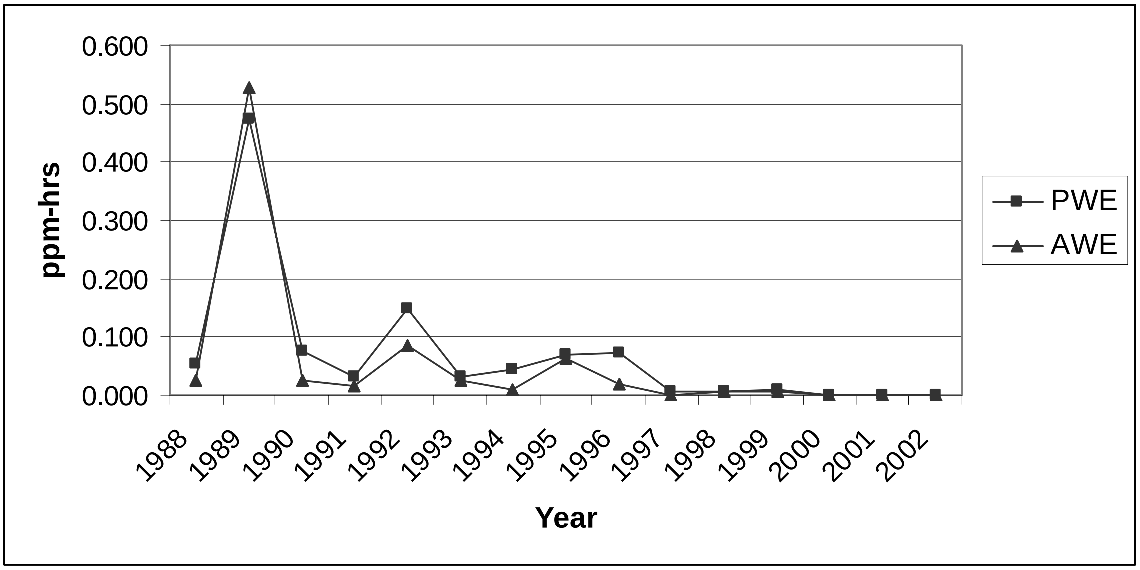


Figure 2-5b
Population-and Area-Weighted Exposure
Santa Barbara County
1990-2002

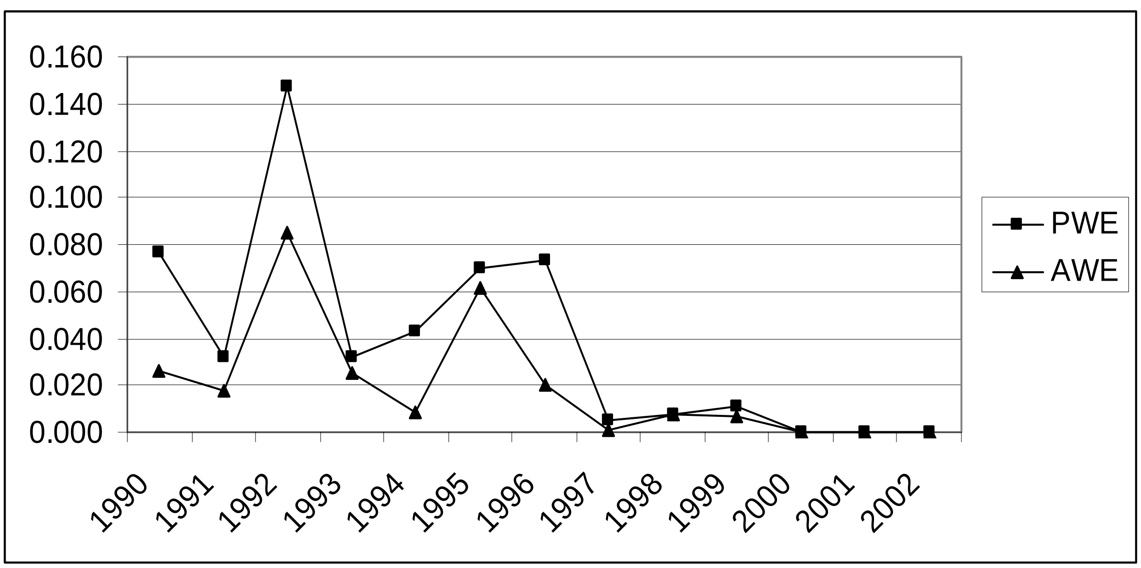
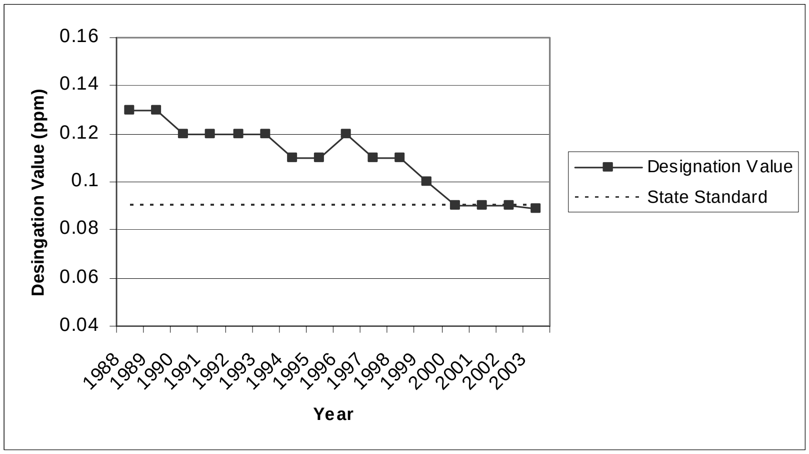
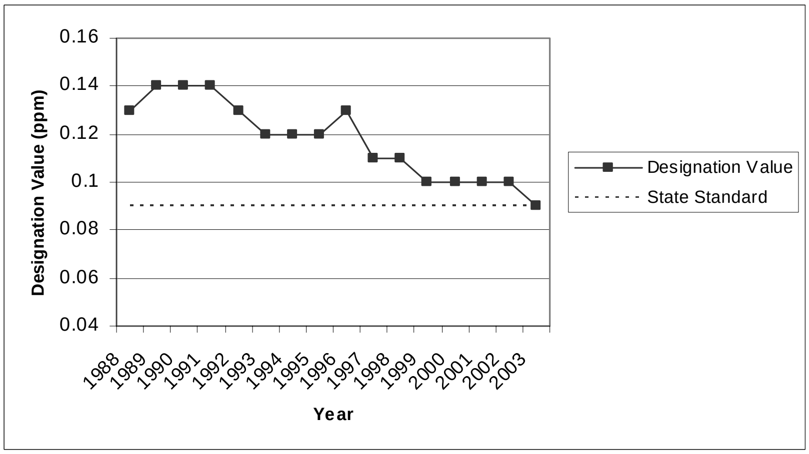


Figure 2-6
1988-2003 Designation Values
Carpinteria, Las Flores Canyon and Paradise Road

Carpinteria



Las Flores Canyon



Paradise Road