APPENDIX 6.2-B - SUPPLEMENTAL AMBIENT AIR QUALITY DATA

This appendix and the following sections provide additional background information and data on the ambient air quality from the closest air monitoring station for each criteria pollutant.

1.0 Ozone

Ozone is generated by a complex series of chemical reactions between volatile organic compounds (VOC) and NOx in the presence of ultraviolet radiation. Ambient ozone concentrations follow a seasonal pattern: higher in the summertime and lower in the wintertime. At certain times, the general area can provide ideal conditions for the formation of ozone due to the persistent temperature inversions, clear skies, mountain ranges that trap the air mass, and exhaust emissions from vehicles and other stationary sources. Based upon ambient air measurements at stations throughout the area, San Diego County is classified as a serious non-attainment area for the state ozone standards and a non-attainment area for the federal 8-hour ozone standard.

Table 6.2–B1 – Ozone Levels, Escondido Monitoring Station 1996–2007 (ppm)

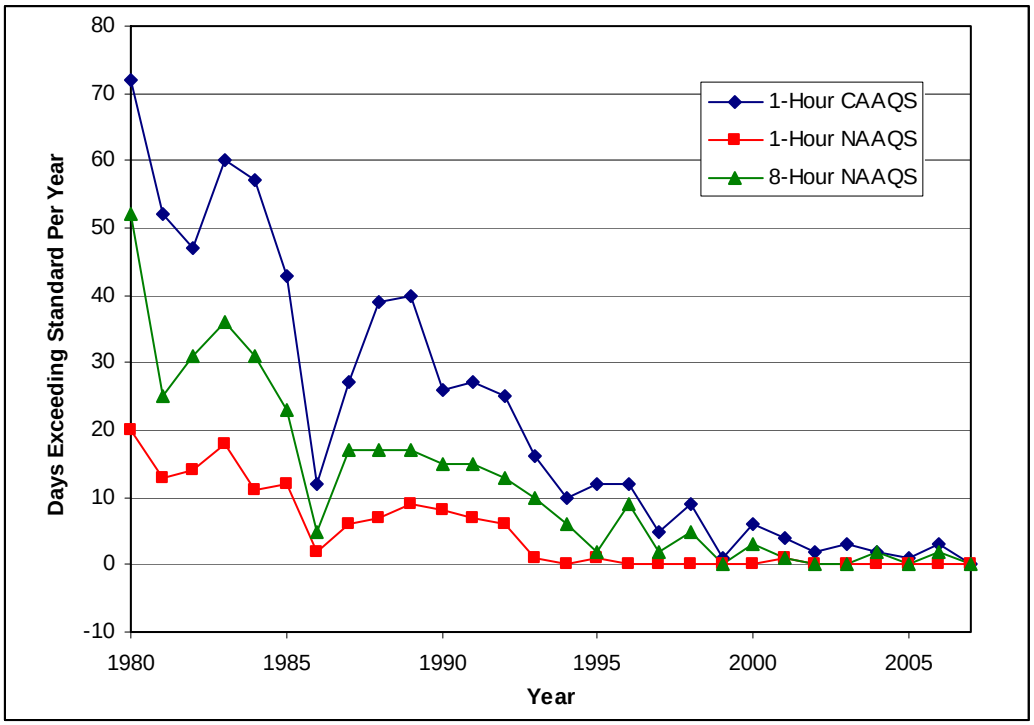
Year	Days Above Standard			Station: Escondido - E. Valley Parkway					
	1-Hour		8-Hour	1-Hour Observations			8-Hour Averages		
	CAAQS	NAAQS	NAAQS	Maximum	Date Observed	3-Year 4th High	Maximum	Date Observed	3-Year 4th High
2007	0	0	0	0.094	Aug-31	0.095	0.077	Sep-1	0.074
2006	3	0	2	0.108	Jul-22	0.098	0.096	Jul-22	0.073
2005	1	0	0	0.095	Sep-03	0.098	0.079	Apr-16	0.073
2004	2	0	2	0.099	Apr-27	0.099	0.086	Apr-27	0.073
2003	3	0	0	0.105	Sep-21	0.103	0.083	Sep-21	0.074
2002	2	0	0	0.100	Sep-01	0.110	0.081	Sep-22	0.075
2001	4	1	1	0.141	Sep-30	0.110	0.098	Sep-30	0.075
2000	6	0	3	0.124	Sep-16	0.122	0.106	Sep-16	0.079
1999	1	0	0	0.104	Aug-25	0.114	0.080	Apr-18	0.080
1998	9	0	5	0.122	Jul-26	0.115	0.092	Aug-29	0.086
1997	5	0	2	0.114	Oct-31	0.114	0.090	Jul-03	0.085
1996	12	0	9	0.119	Jun-10	0.120	0.099	Jun-30	0.089
1995	12	1	2	0.154	Jul-27	0.122	0.107	Jul-27	0.090
1994	10	0	6	0.122	Aug-05	0.140	0.105	Aug-05	0.096
1993	16	1	10	0.154	Sep-25	0.154	0.112	Sep-25	0.098
1992	25	6	13	0.150	Apr-26	0.170	0.120	Apr-25	0.099
1991	27	7	15	0.210	Oct-19	0.170	0.145	Oct-19	0.101
1990	26	8	15	0.170	Jun-26	0.170	0.108	Jun-26	0.102
1989	40	9	17	0.190	Mar-31	0.170	0.123	Mar-31	0.105
1988	39	7	17	0.180	Oct-09	0.160	0.132	Apr-06	0.099
1987	27	6	17	0.170	Sep-30	0.160	0.123	Sep-30	0.105
1986	12	2	5	0.130	May-18	0.170	0.107	May-18	0.110
1985	43	12	23	0.170	Jul-08	0.200	0.136	Apr-13	0.125
1984	57	11	31	0.240	Sep-15	0.200	0.141	Sep-15	0.121
1983	60	18	36	0.200	Aug-05	0.190	0.158	Aug-05	0.116
1982	47	14	31	0.220	Sep-01	0.180	0.162	Sep-01	0.113
1981	52	13	25	0.190	Feb-19	0.200	0.150	Feb-19	0.115
1980	72	20	52	0.200	Apr-16	0.200	0.132	Apr-16	0.118

Source: California Air Quality Data, California Air Resources Board website http://www.arb.ca.gov/adam/welcome.html).

As shown in Table 6.2B–1, this region is making progress with the 8-hour average national standard and the State 1-hour standard, and peak ozone concentrations have decreased with time.

The long-term trends of maximum ozone exceedance of the state and federal standard are shown in the figure below (Figure 6.2-11) for the Escondido monitoring station. The data show a significant reduction in the number of days the standards were exceeded.

Figure 6.2B–1 – Long-Term Trends of Maximum Ozone Readings Days Exceedance



Source: TRC, 2007

2.0 Nitrogen Dioxide

Atmospheric NO_2 is formed primarily from reactions between nitric oxide (NO) and oxygen or ozone. NO is formed during high temperature combustion processes, when the nitrogen and oxygen in the combustion air combine. Although NO is less harmful than NO_2, it can be converted to NO_2 in the atmosphere within minutes to hours, depending on the composition and temperature of the atmosphere. For purposes of state and federal air quality planning, San Diego County is in attainment for NO_2.

The table below (Table 6.2B–2) shows the long-term trend of maximum one-hour NO_2 levels recorded at the Escondido monitoring station, as well as the annual average level for each of those years. During this period there has not been a single violation of either the state one-hour standard or the annual average standard. This is also true with the Federal standards since they are less stringent than the State standards.

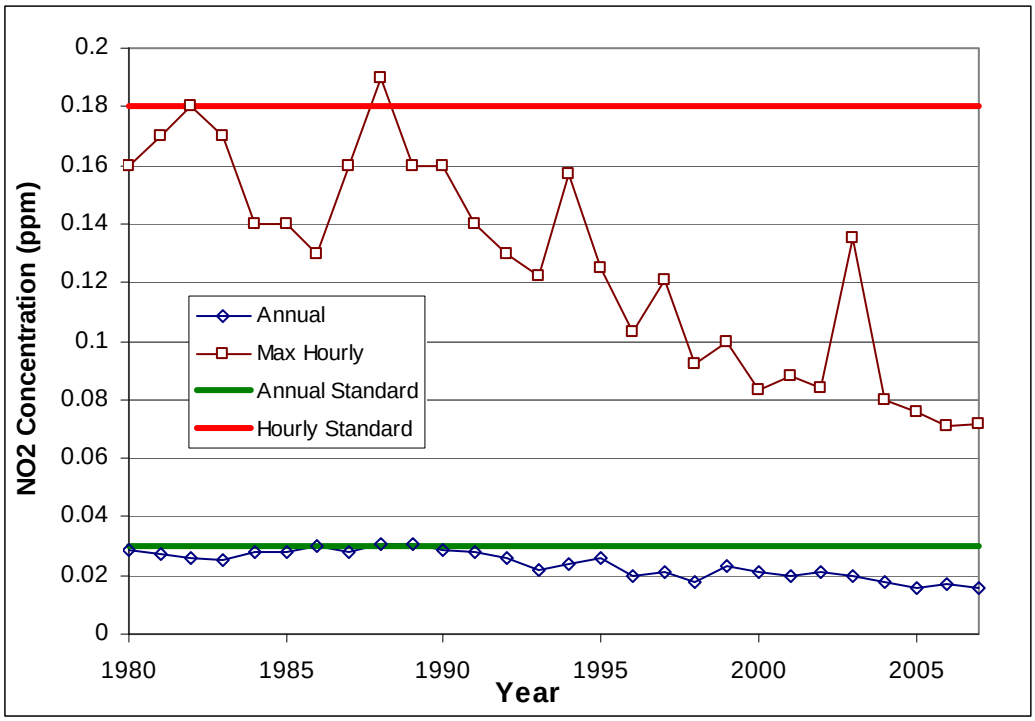
Table 6.2B–2 – NO2 Levels, Escondido Monitoring Station, 1996-2007 (ppm)

Year	Est. Days > Std.	Annual Average	Highest Hourly		Year	Est. Days > Std.	Annual Average	Highest Hourly	
	CAAQS	Value	Value	Date Observed		CAAQS	Value	Value	Date Observed
2007	0	0.016	0.072	Nov-28	1993	0	0.022	0.122	Sep-27
2006	0	0.017	0.071	Nov-22	1992	0	0.026	0.130	Jan-23
2005	0	0.016	0.076	Oct-13	1991	0	0.028	0.140	Feb-04
2004	0	0.018	0.080	Oct-08	1990	0	0.029	0.160	Oct-25
2003	0	0.020	0.135	Oct-28	1989	0	0.031	0.160	Nov-08
2002	0	0.021	0.084	Feb-27	1988	0	0.031	0.190	Feb-08
2001	0	0.020	0.088	Nov-20	1987	0	0.028	0.160	Jan-22
2000	0	0.021	0.083	Nov-28	1986	0	0.030	0.130	Jan-10
1999	0	0.023	0.100	Mar-01	1985	0	0.028	0.140	Jan-17
1998	0	0.018	0.092	Oct-23	1984	0	0.028	0.140	Sep-05
1997	0	0.021	0.121	Oct-31	1983	0	0.025	0.170	Nov-03
1996	0	0.020	0.103	Nov-12	1982	0	0.026	0.180	Oct-22
1995	0	0.026	0.125	Nov-24	1981	0	0.027	0.170	Dec-18
1994	0	0.024	0.157	Jan-22	1980	0	0.029	0.160	Sep-29

Source: California Air Quality Data, California Air Resources Board website www.arb.ca.gov/adam/welcome.html

The figure below (Figure 6.2B–2) shows the historical trend of maximum one-hour NO2 levels at Escondido. Annual average concentrations and trends are also shown.

Figure 6.2B-2 Long Term Trends in Nitrogen Dioxide Concentrations



Note: Annual Standard refers to Annual CAAQS of 0.03 ppm and Hourly Standard refers to 1-hour Maximum CAAQS of 0.18 ppm

3.0 Carbon Monoxide

CO is a product of inefficient combustion, principally from automobiles and other mobile sources of pollution. In many areas of California, CO emissions from wood-burning stoves and fireplaces can also be measurable contributors to ambient CO levels. Industrial sources typically contribute less than 10 percent of ambient CO levels. Peak CO levels usually occur during late fall and early winter due to a combination of higher emission rates and calm weather conditions with strong, ground-based inversions. San Diego County is classified as an attainment area for CO with respect to both state and national standards.

Table 6.2B–3 below shows the California and National Ambient Air Quality Standards for CO, and the maximum one- and eight-hour average levels recorded at the Escondido monitoring station during the period 1980-2006.

Table 6.2B–3 - CO Levels, Escondido Monitoring Station, 1998-2007 (ppm)

Year	Est. Days > CAAQS Std.	Highest 8-Hour Average CAAQS	Date Observed	Year	Est. Days > CAAQS Std.	Highest 8-Hour Average CAAQS	Date Observed
2007	0	3.190	Dec-25	1993	0	7.380	Nov-27
2006	0	3.610	Dec-24	1992	0	7.250	Jan-25
2005	0	3.100	Jan-20	1991	0	7.880	Dec-04
2004	0	3.610	Dec-11	1990	0	8.750	Jan-10
2003	1	10.640	Oct-28	1989	4	10.000	Dec-23
2002	0	3.850	Jan-21	1988	0	9.250	Dec-02
2001	0	5.110	Jan-05	1987	0	9.250	Dec-01
2000	0	4.930	Nov-21	1986	0	9.380	Jan-12
1999	0	5.260	Dec-18	1985	1	9.750	Dec-19
1998	0	4.450	Jan-08	1984	0	7.630	Dec-25
1997	0	4.910	Nov-01	1983	0	8.880	Dec-08
1996	0	7.130	Jan-07	1982	1	10.250	Jan-09
1995	0	5.950	Nov-25	1981	1	11.250	Jan-10
1994	0	7.510	Dec-20	1980	1	10.130	Nov-27

Source: California Air Quality Data, California Air Resources Board website http://www.arb.ca.gov/adam/welcome.html).

The trend of maximum eight-hour average CO concentrations has been generally decreasing and concentrations are generally below the state standard of 9.0 ppm for the last 10 years. The one day exceedance listed for 2003 was due to a local fire. The highest reading excluding the fire event is 3.9 ppm for that year.

4.0 Sulfur Dioxide

SO_2 is produced when any sulfur-containing fuel is burned. It is also emitted by chemical plants that treat, or refine, sulfur or sulfur-containing chemicals. Natural gas contains only a small amount of sulfur, typically about 0.2 grains per standard cubic foot, while fuel oils contain larger amounts, typically in the range of 15 ppm (for ultra-low sulfur diesel fuel) to 4 percent (for marine bunker fuels). Peak, but low, concentrations of SO_2 occur at different times of the year in different parts of

California, depending on local fuel characteristics, weather, and topography. San Diego County is in attainment for SO_2 for purposes of state and federal air quality planning. The table below presents the monitored SO_2 and levels recorded from 1980 through 1998 at the Escondido monitoring station. Monitoring of SO_2 at Escondido was discontinued thereafter and the later data presented is from San Diego. The federal 24-hour average standard is 0.14 ppm; during the period shown, the average SO_2 levels measured at stations in the Project area have been approximately 10 percent of the federal standard.

Table 6.2B−4 - SO_2 Levels, Escondido Monitoring Station, 1998-2007 (ppm)

Year	1 Hour 1st High	3 Hour 1st High	24 Hour 1st High	Annual Average
San Diego 1110 Beardsley Street				
2007	0.018	0.010	0.006	0.0030
2006	0.034	0.030	0.009	0.0040
San Diego 12th Avenue				
>2005	Monitoring discontinued at location			
2005	0.040	0.019	0.006	0.0023
2004	0.042	0.020	0.009	0.0038
2003	0.036	0.019	0.008	0.0045
2002	0.028	0.015	0.007	0.0033
2001	0.052	0.036	0.010	0.0032
2000	0.038	0.029	0.010	0.0037
1999	0.039	0.025	0.008	0.0019
1998	0.040	0.037	0.011	0.0032
1997	0.052	0.032	0.011	0.0027
1996	0.048	0.034	0.011	0.0030
1995	0.063	0.051	0.017	0.0029
1994	0.069	0.036	0.013	0.0026
1993	0.047	0.033	0.018	0.0029
Escondido				
>1992	Monitoring discontinued at location			
1992	0.020	0.016	0.012	0.0046
1991	0.070	0.030	0.013	0.0038
1990	0.030	0.020	0.012	0.0032
1989	0.030	0.020	0.013	0.0028
1988	0.030	0.020	0.011	0.0028
1987	0.110	0.103	0.036	0.0025
1986	0.030	0.026	0.016	0.0042
1985	0.030	0.030	0.017	0.0032
1984	0.020	0.020	0.012	0.0032
1983	0.030	0.023	0.015	0.0036
1982	0.040	0.036	0.020	0.0067
1981	0.050	0.040	0.026	0.0074
1980	0.050	0.040	0.034	0.0083
Maximum	0.110	0.103	0.036	0.0083
NAAQS	-	0.500	0.140	0.0300
CAAQS	0.250	-	0.040	-

Source: California Air Quality Data, California Air Resources Board website www.arb.ca.gov/adam/welcome.html).

5.0 Respirable Particulates (PM_{10})

Particulates in the air are caused by a combination of wind-blown fugitive dust; particles emitted from combustion sources and manufacturing processes; sea salts; and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and nitrogen oxides, respectively. In 1984, CARB adopted standards for PM_{10} and phased out the total suspended particulate (TSP) standards that had been in effect previously. PM_{10} standards were substituted for TSP standards because PM_{10} corresponds to the size range of particulates that can be inhaled into the lungs (respired), and therefore is a better measure to use in assessing potential health effects. In 1987, EPA also replaced national TSP standards with PM_{10} standards. San Diego County is unclassified for the federal PM_{10} standard and is a non-attainment area for the state standard.

The table below shows the federal and state air quality standards for PM_{10}, maximum levels recorded at the Escondido monitoring station during 1993-2007.

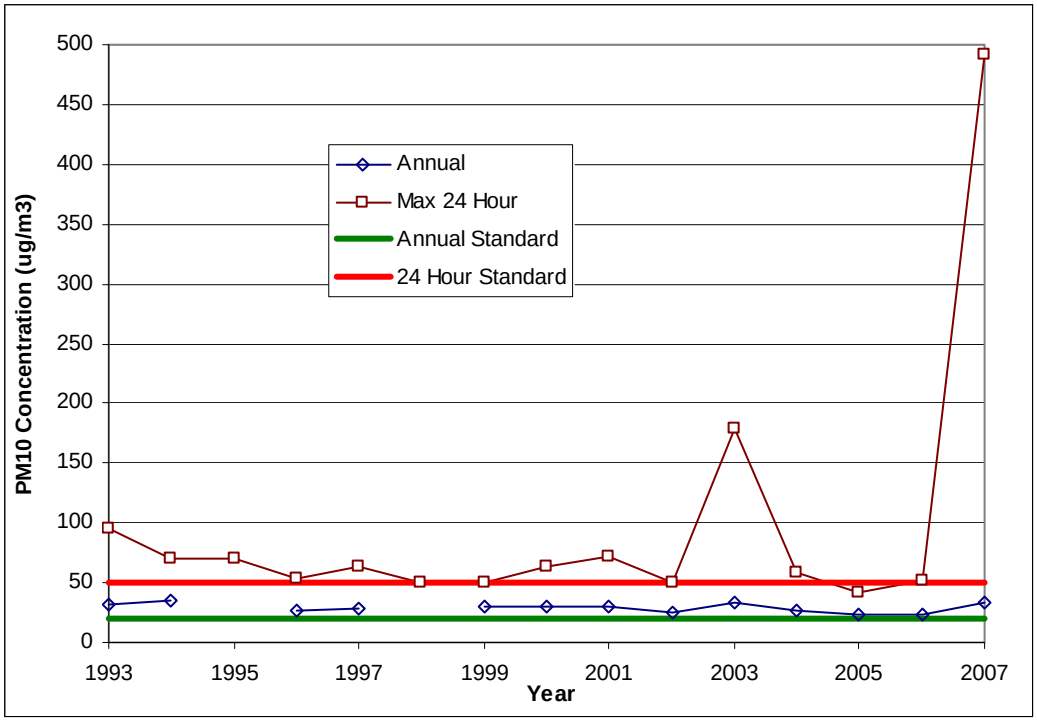
Table 6.2B–5 - PM_{10} Levels, Escondido Monitoring Station, 1993-2007 ($\mu g/m^3$)

Year	Est. Days > 24-Hour Std. Estimated		Annual Average		High 24-Hr Average		
	NAAQS	CAAQS	NAAQS	CAAQS	NAAQS	CAAQS	Date Observed
2007	1.5	24.2	28.9	34.2	504	492	Oct-22
2006	0	5.8	24.1	24.2	51	52	Dec-25
2005	0	0	23.9	23.9	42	42	Oct-13
2004	0	6.1	27.5	27.3	57	58	Jan-10
2003	3.3	30.7	31.6	32.7	179	179	Oct-29
2002	0	0	27.1	25.1	51	50	Sep-05
2001	0	12.6	31.2	30.6	74	72	Jan-01
2000	0	12.3	29.6	29.5	65	63	Dec-02
1999	0	0	30	29.7	52	50	Dec-08
1998	*	*	18.7	*	51	51	Oct-08
1997	0	18.6	28.8	28.8	63	63	Oct-31
1996	0	12.3	26.8	26.7	53	53	Dec-05
1995	0	*	31.5	*	70	70	Dec-11
1994	0	30.3	35.3	35.3	70	70	Nov-22
1993	0	30.1	31.8	31.8	96	96	Oct-28

Source: California Air Quality Data, California Air Resources Board website http://www.arb.ca.gov/adam/welcome.html). Note: (*) denotes that there was insufficient (or no) data available to determine the value

The trend of maximum 24-hour average and annual average PM_{10} levels are plotted in the Figure 6.2B–3. The high monitored concentrations in 2003 and 2007 are attributable to wild fire events. If these events are excluded, the area meets NAAQS but still exceeds the CAAQS.

Figure 6.2B-3 Long-term PM_{10} Concentrations Trends



Note: Annual Standard refers to Annual CAAQS of 20 µg/m^3 and Hourly Standard refers to 24-hour Maximum CAAQS of 50 µg/m^3

6.0 Fine Particulate ($PM_{2.5}$)

As discussed previously, the NAAQS for particulates were further revised by EPA with new standards that went into effect on September 16, 1997; two new $PM_{2.5}$ standards were added at that time. In June 2002, CARB established a new annual standard for $PM_{2.5.}$ $PM_{2.5}$ data have been collected at the Escondido monitoring station since 1999, and are presented below.

The table below shows the number of days exceeding the federal air quality standard for $PM_{2.5}$, maximum levels recorded at the Escondido monitoring station 1999-2005, and annual averages for the same period. There are not enough data available to draw conclusions regarding trends in the 3-year average of 98th percentile values. The high value shown in 2007 was a wildfire event. Annual average $PM_{2.5}$ levels have generally been below the federal standard, but above the state standard. San Diego County is considered a non-attainment area for the state $PM_{2.5}$ standard, but is unclassified for the federal standard.

Table 6.B–6 – $PM_{2.5}$ Levels, Escondido Monitoring Station, 1993-2007 ($\mu g/m^3$)

Year	Est. Days > 24-Hour Std.				
	NAAQS	CAAQS	Annual Average	High 24-Hr Average	Date Observed
2007	2	n/a	13.3	151.0	Oct-23
2006	0	n/a	11.5	40.6	Dec-25
2005	0	n/a	*	43.1	Jan-01
2004	1	n/a	14.1	67.3	Jan-01
2003	1	n/a	14.2	69.2	Oct-27
2002	0	n/a	16.0	53.6	Jan-01
2001	0	n/a	17.5	60.0	Jan-01
2000	1	n/a	15.8	65.9	Dec-24
1999	0	n/a	18.0	64.3	Oct-28
< 1998	Not measured at station				

Source: California Air Quality Data, California Air Resources Board website http://www.arb.ca.gov/adam/welcome.html).

7.0 Airborne Lead

The majority of lead in the air results from the combustion of fuels that contain lead. Twenty-five years ago, motor gasoline contained relatively large amounts of lead compounds used as octane-rating improvers, and ambient lead levels were relatively high. Beginning with the 1975 model year, new automobiles began to be equipped with exhaust catalysts, which were not compatible with the exhaust products of leaded gasoline. Thus, unleaded gasoline became the required fuel for an increasing fraction of new vehicles, and the phase-out of leaded gasoline began. As a result, ambient lead levels decreased dramatically. San Diego County has been in attainment of state and federal airborne lead levels for air quality planning purposes for a number of years.

The ambient lead levels were monitored before 2002 in San Diego. Due to monitored concentrations well below all air quality standards, San Diego ceased lead monitoring after 2002. Table 6.2B–7 lists the federal air quality lead reported in San Diego County between 1996 and 2001. Maximum quarterly levels are well below the federal standard.

Table 6.B–7 - Airborne Lead Levels, 1996-2001 ($\mu g/m^3$)

Year	Max Highest	Mean	Est. Days > NAAQS Std.	Lead Type	Monitoring Station
2001	0.060	0.0150	0	Lead (TSP)	12th Ave., San Diego
2000	0.070	0.0180	0	Lead (TSP)	12th Ave., San Diego
1999	0.050	0.0140	0	Lead (TSP)	12th Ave., San Diego
1998	0.030	0.0120	0	Lead (TSP)	12th Ave., San Diego
1997	0.160	0.0230	0	Lead (TSP)	12th Ave., San Diego
1996	0.040	0.0130	0	Lead (TSP)	12th Ave., San Diego

Source: California Air Quality Data, California Air Resources Board website http://www.arb.ca.gov/adam/welcome.html).