3.0 SETTING

This chapter presents the existing environmental setting for the project. The EIR focuses on the potentially significant environmental topics identified in the Initial Study (Appendix A). The reader is referred to the Initial Study for discussion of environmental topics not considered in this EIR and the rationale for inclusion or exclusion of each environmental topic.

3.1 Air Quality

The current air quality at the Refinery, Montebello Terminal, Van Nuys Terminal, Huntington Beach Terminal, and their surrounding areas is presented in this section. The reader is referred to the SCAQMD's 1997 Air Quality Management Plan (AQMP) (SCAQMD, 1996) and SCAQMD's Final 1999 Amendment to the 1997 Ozone AQMP Revision for the South Coast Air Basin (SCAQMD, 1999) for information specifically related to air quality in the South Coast Air Basin.

3.1.1 Regional Climate

All of California is divided into air basins, which are served by either county air pollution control districts or multi-county air quality management districts. The Refinery and three distribution terminals are located within the SCAQMD's jurisdiction (referred to hereafter as the district). The district consists of the South Coast Air Basin (Basin), which includes portions of Los Angeles, Riverside, and San Bernardino counties and all of Orange County. Within Riverside County, the district also has jurisdiction over the Salton Sea Air Basin and a portion of the Mojave Desert Air Basin. Figure 3.1-1 shows the Southern California Air Basins. The Basin is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east.

The area in the vicinity of the Refinery, Montebello Terminal, Van Nuys Terminal, and Huntington Beach Terminal is dominated by a semi-permanent, subtropical, Pacific high-pressure system. Generally mild, the climate is tempered by cool sea breezes, but may be infrequently interrupted by periods of extremely hot weather, passing winter storms, or Santa Ana winds. The Montebello and Van Nuys Terminals are located somewhat farther inland, where the temperature is generally higher and the relative humidity lower than along the coast.

3.1.2 Meteorology of the Project Vicinity

The El Segundo Refinery and Huntington Beach Terminal are located on the coast in areas where the topography is relatively flat. Because of the close proximity of the ocean, winters are seldom cold, frost is rare, and minimum temperatures average around 45^{o}F. Spring days may be cloudy because of the presence of high fog. Rainfall averages about 10 inches a year, falling almost entirely from late October to early April. To determine the historical meteorological profile of the area in the vicinity of the El Segundo Refinery and Huntington Beach Terminal, temperature

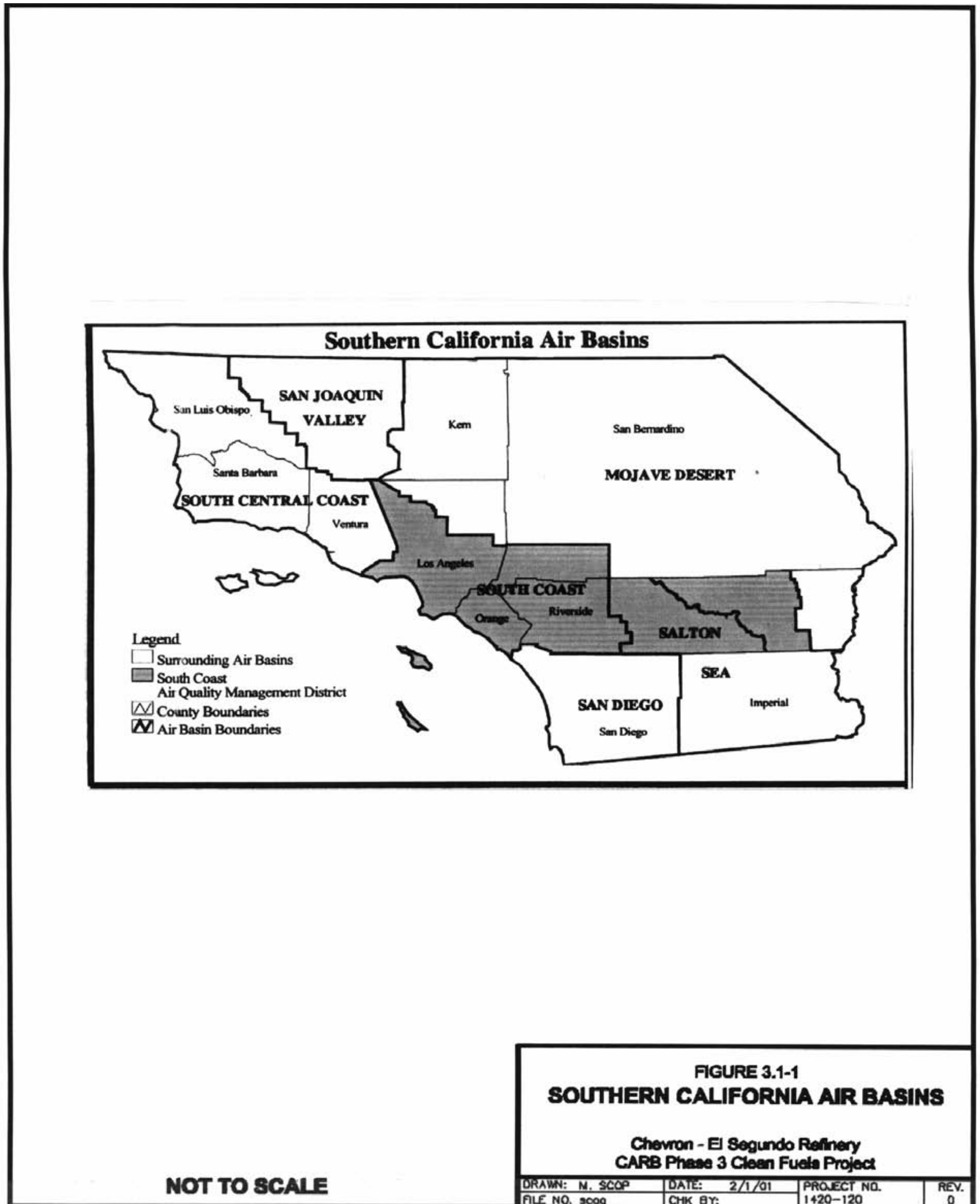


Figure 3.1-1 SCAQMD Jurisdiction

(mean, maximum, and minimum) and precipitation data from the Los Angeles and Long Beach airports are used. Tables 3.1-1 and 3.1-2 present the temperature and precipitation data for the Los Angeles and Long Beach airports, respectively.

Table 3.1-1
Average Monthly Temperatures and Precipitation for Los Angeles Airport, CA, 1939-1978

Month	Los Angeles Airport		
	Mean Monthly Temperatures		Total Precipitation (inches)
	Maximum (℉)	Minimum (℉)	
January	64	46	2.44
February	65	48	2.71
March	65	49	1.84
April	67	52	0.90
May	69	55	0.12
June	72	59	0.03
July	75	62	0.01
August	76	63	0.07
September	76	61	0.21
October	74	58	0.36
November	70	51	1.41
December	66	47	2.12
Annual Average	70	54	**12.22**
Absolute extreme temperatures	110	23	
Reference: Weather of U.S. Cities (Gale 1981)			

Table 3.1-2
Average Monthly Temperatures and Precipitation for Long Beach, CA, 1941-1978

Month	Long Beach		
	Mean Monthly Temperatures		Total Precipitation (inches)
	Maximum (℉)	Minimum (℉)	
January	65	44	2.14
February	66	46	2.18
March	67	48	1.53
April	70	51	0.76
May	73	55	0.14
June	76	58	0.04
July	81	62	Trace
August	82	63	0.09
September	81	61	0.16
October	77	56	0.15
November	72	50	1.43
December	67	43	1.65
Annual Average	73	53	**10.27**
Absolute extreme temperatures	111	21	
Reference: Weather of U.S. Cities (Gale 1981)			

The Montebello and Van Nuys Terminals are located farther inland. Therefore, the data for the Los Angeles Civic Center is the most appropriate for these two terminals. At the Los Angeles Civic Center, average daily temperature fluctuations are about 30 degrees in the summer and 25 degrees in the winter. Rainfall averages about 15 inches a year, falling almost entirely between November and March. The data for the Los Angeles Civic Center are shown in Table 3.1-3. The locations of the three meteorological monitoring stations, Los Angeles Airport, Long Beach Airport, and Los Angeles Civic Center, are shown relative to the project sites in Figure 3.1-2.

Table 3.1-3
Average Monthly Temperatures and Precipitation for
Los Angeles Civic Center, CA, 1939-1978

Month	Los Angeles Civic Center		
	Mean Monthly Temperatures		Total Precipitation (inches)
	Maximum (°F)	Minimum (°F)	
January	65	47	3.06
February	66	48	3.07
March	68	50	2.55
April	70	52	1.07
May	72	55	0.32
June	77	58	0.06
July	82	61	0.01
August	83	62	0.05
September	81	60	0.23
October	77	56	0.50
November	73	52	1.37
December	67	48	2.62
Annual Average	73	54	**14.91**
Absolute extreme temperatures	110	28	
Reference: Weather of U.S. Cities (Gale 1981)			

Seasonal and diurnal wind regimes affect the horizontal transport of air in the vicinity of the coastal project locations. Diurnal sea breeze-drainage flow typically dominates the local wind pattern with the onshore winds split by the Palos Verdes hills unless the marine layer is very deep. Typical winter and summer season wind patterns for morning and afternoon for the Basin are shown in Figure 3.1-3.

A wind rose depicts the frequency of the annual average wind speeds by direction. An annual wind rose for Lennox, representative of the El Segundo Refinery, is shown in Figure 3.1-4. An annual wind rose for the Long Beach Airport, representative of the Huntington Beach Terminal, is shown in Figure 3.1-5. An annual wind rose for Pico Rivera, representative of the Montebello Terminal, is shown in Figure 3.1-6. An annual wind rose for Reseda, representative of the Van Nuys Terminal, is shown in Figure 3.1-7

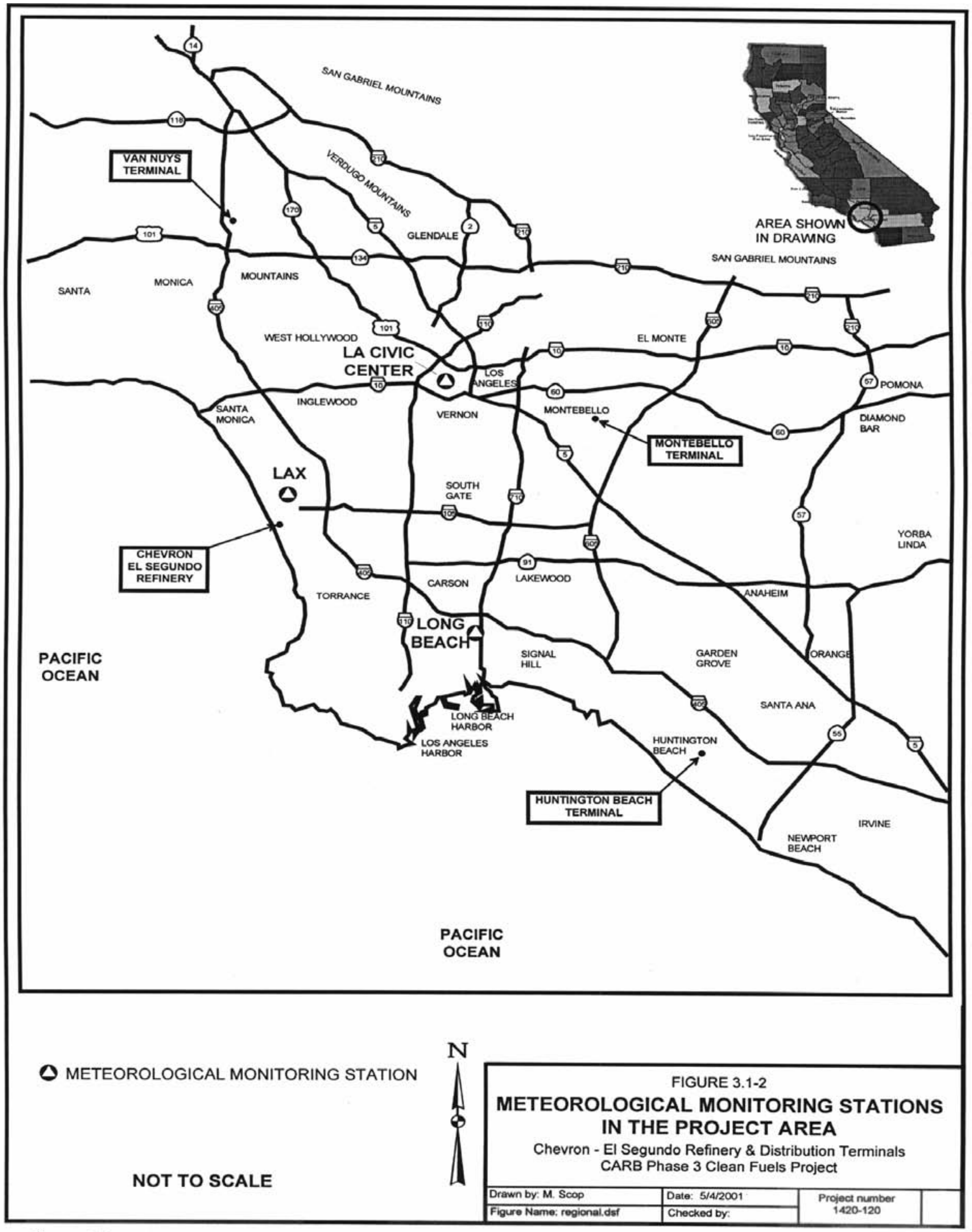
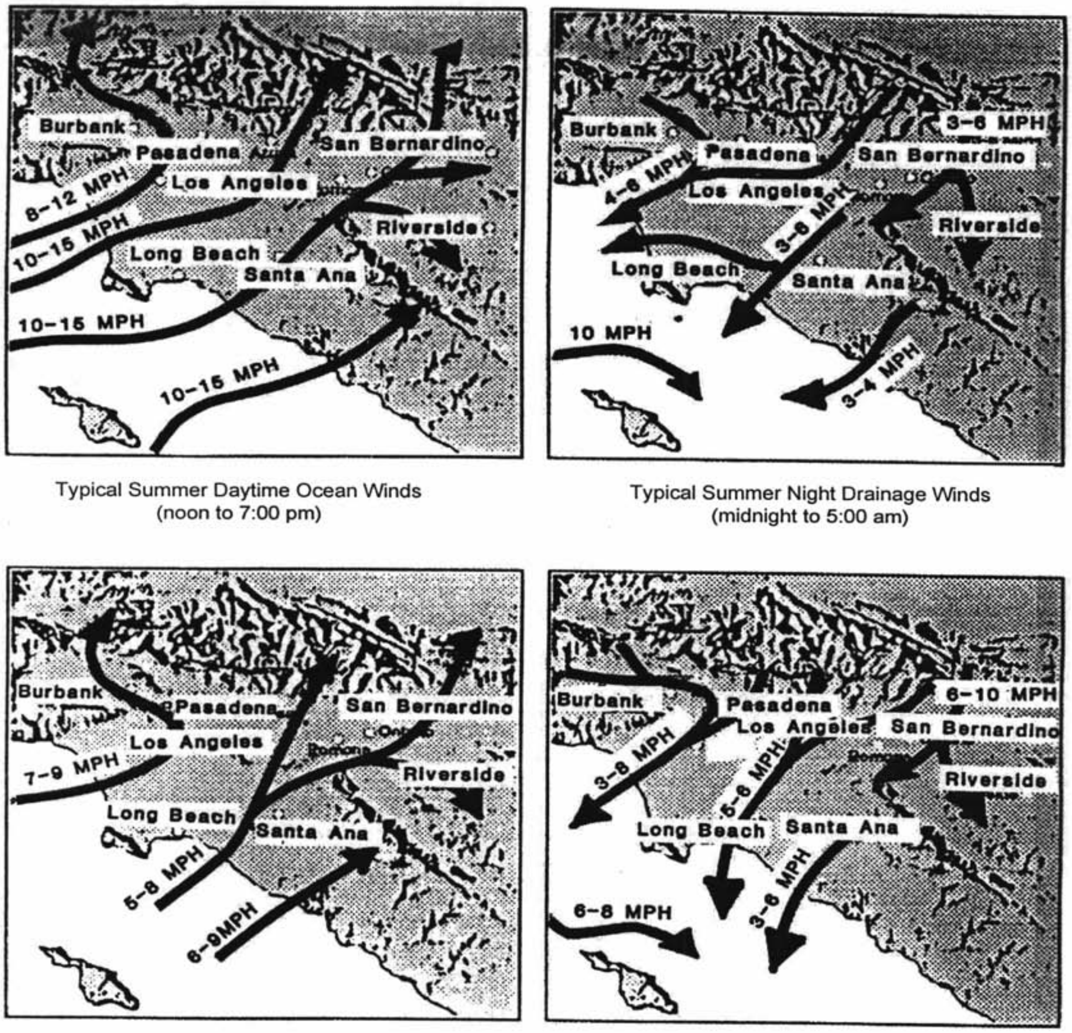


Figure 3.1-2 Meteorological Monitoring Stations in the Project Area



Typical Summer Daytime Ocean Winds
(noon to 7:00 pm)

Typical Summer Night Drainage Winds
(midnight to 5:00 am)

Typical Winter Daytime Ocean Winds
(noon to 7:00 pm)

Typical Winter Night Drainage Winds
(midnight to 5:00 am)

FIGURE 3.1-3

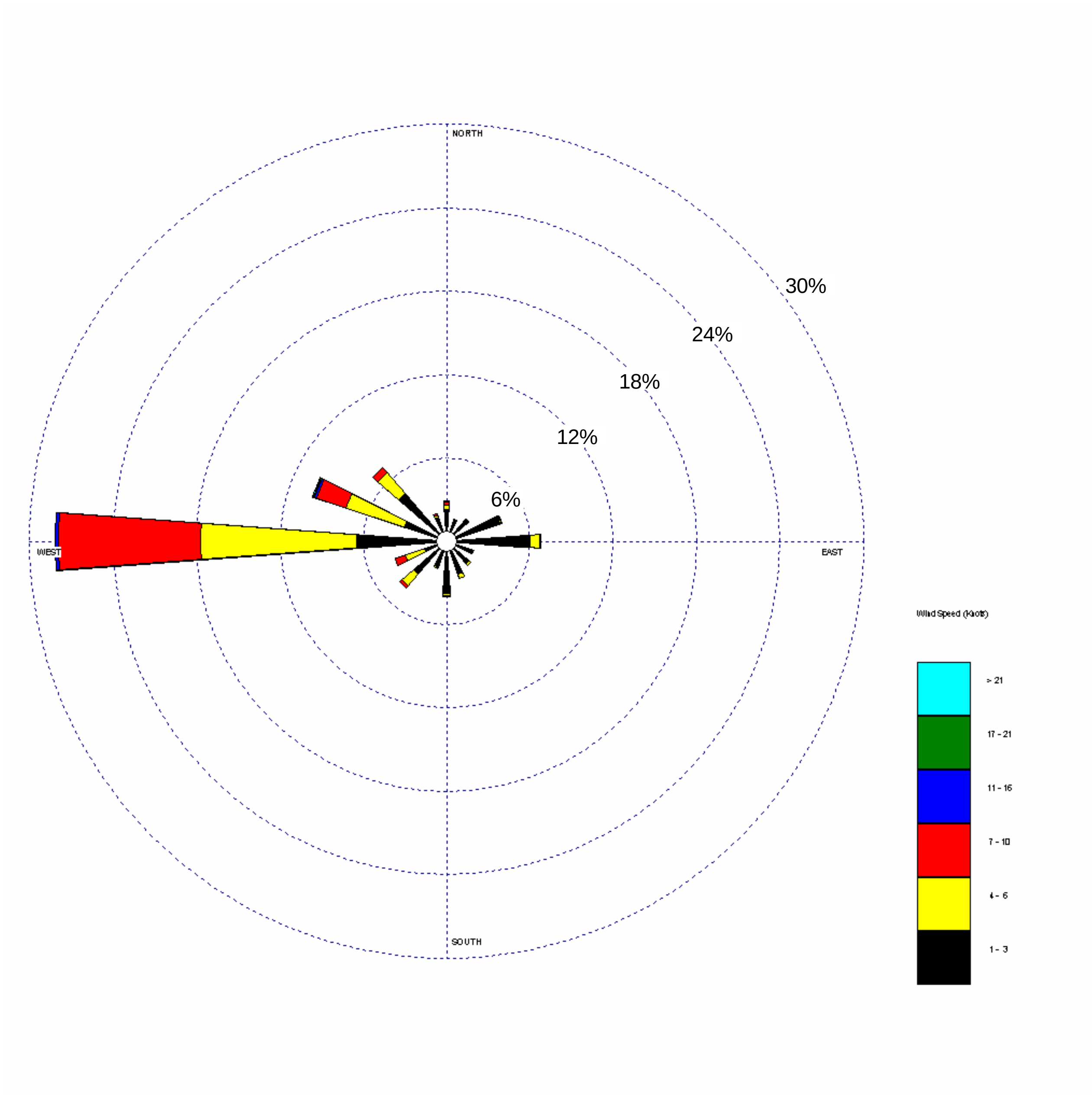
Dominant Wind Patterns in the Basin

Chevron - El Segundo Refinery
CARB Phase 3 Clean Fuels Project

Drawn by: M. Scop	Date: 1/31/2001	Project number 1420-120	REV. 0
Figure Name: Figure 3_1-3.dsf	Checked by:		

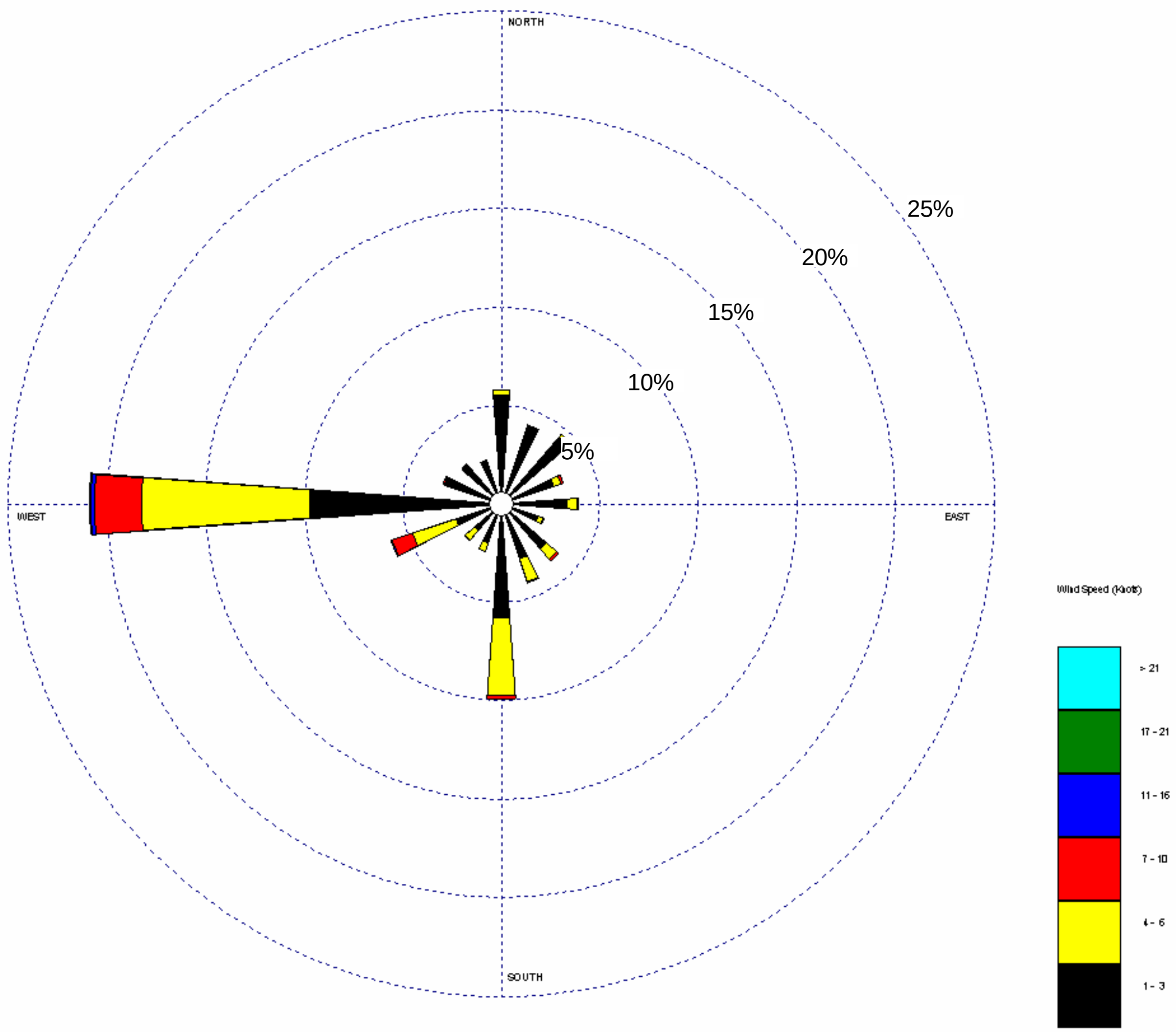
Reference: AQMD CEQA Air Quality Handbook, November 1993

Figure 3.1-3 Dominant Wind Patterns in the Basin



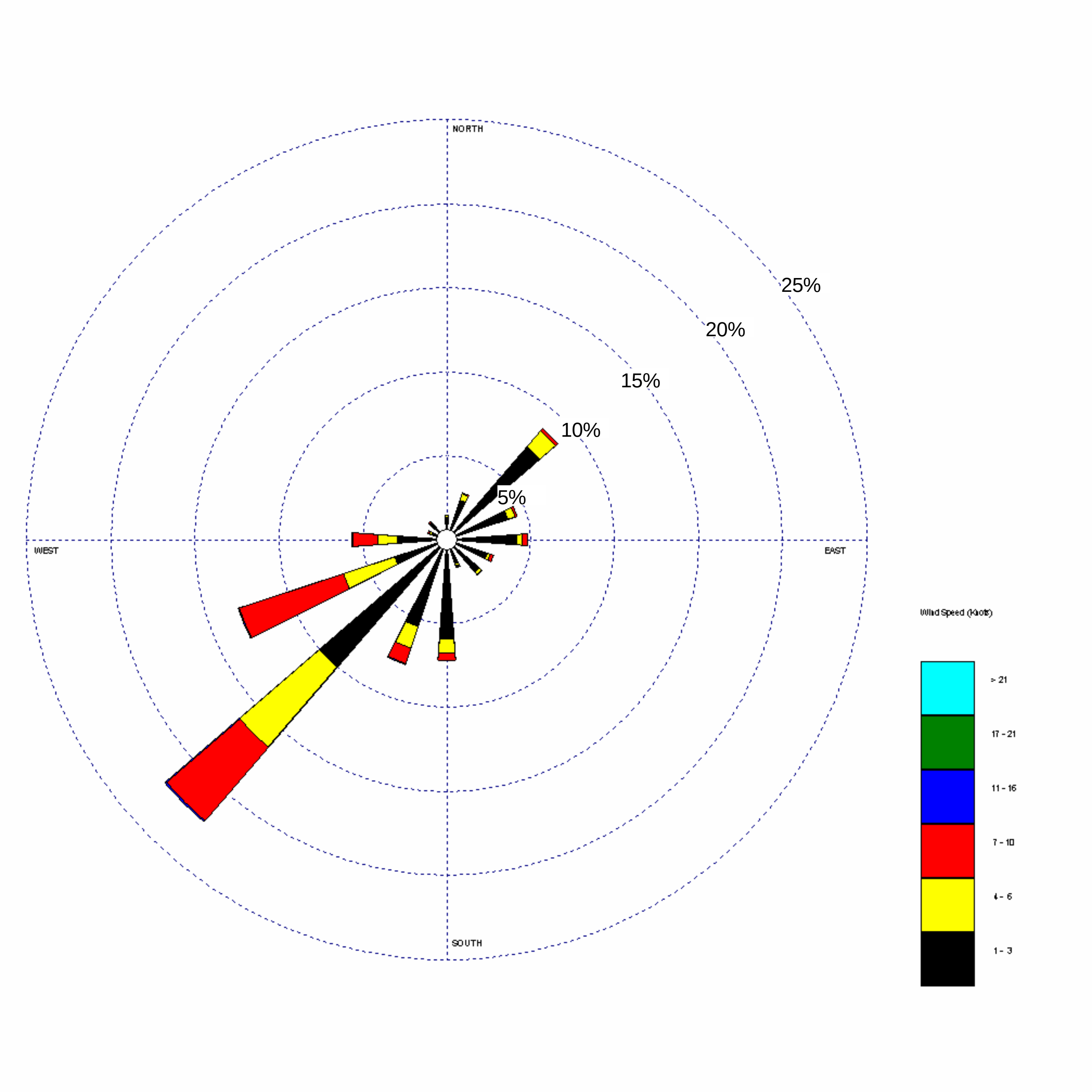
Note: Wind direction is the direction from which the wind is blowing

Figure 3.1-4 Lennox Station, 1981
Representative of El Segundo Refinery



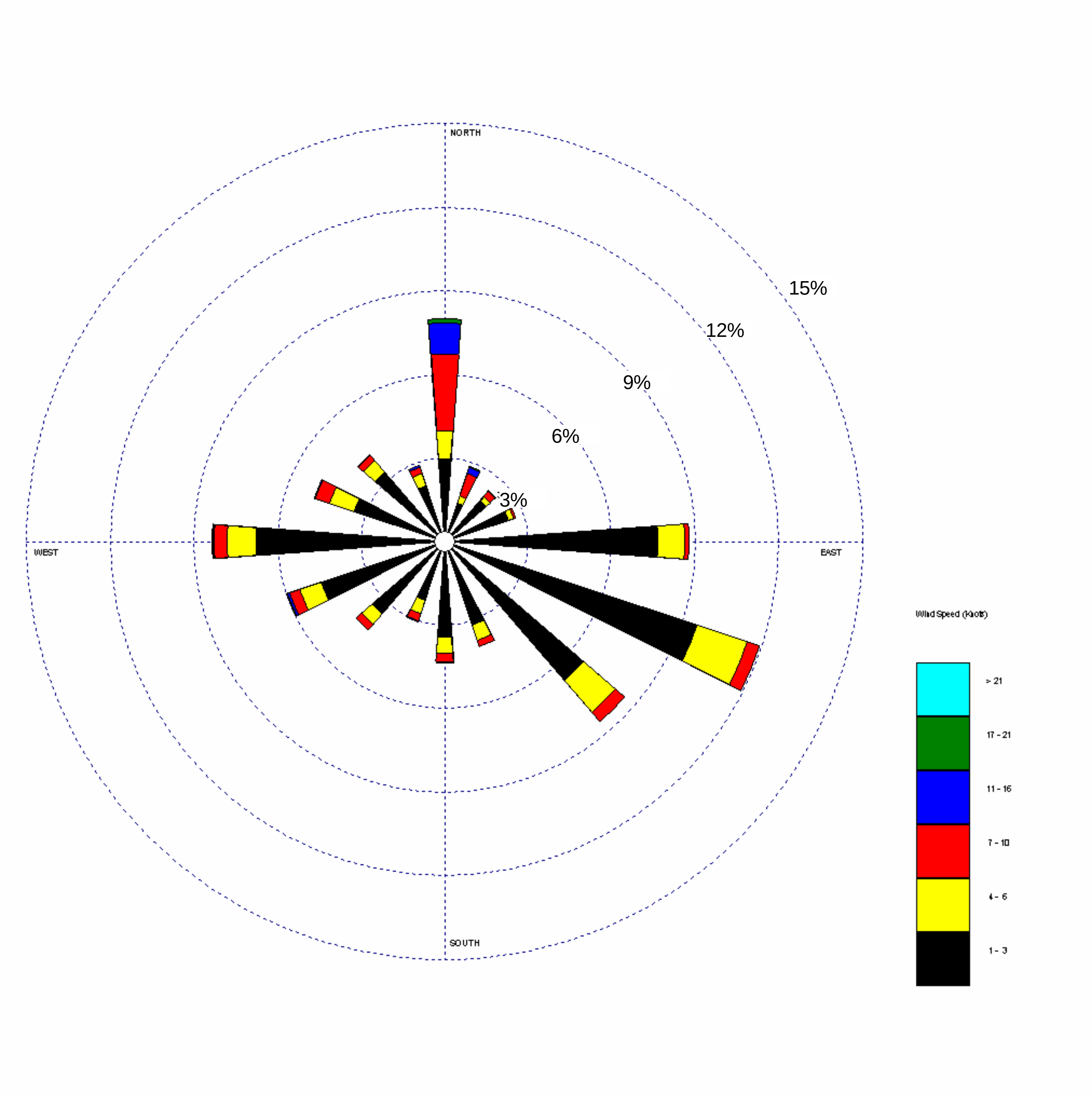
Note: Wind direction is the direction from which the wind is blowing

Figure 3.1-5 Long Beach Airport Station, 1981
Representative of Huntington Beach Terminal



Note: Wind direction is the direction from which the wind is blowing

Figure 3.1-6 Pico Rivera Station, 1981
Representative of Montebello Terminal



Note: Wind Direction is the Direction the Wind is Blowing From

Figure 3.1-7 Reseda Station, 1981
Representative of Van Nuys Terminal

Normally, the temperature of the atmosphere decreases with altitude. However, the phenomenon of temperature increase with altitude is termed an inversion. This inversion condition can exist at the surface or at any height above the ground. The height of the base of the inversion often corresponds to the mixing height. Usually, the mixing height increases throughout the morning and early afternoon because the sun warms the ground, which in turn warms the adjacent air. As this warm air rises, it erodes and raises the base of the inversion layer. If enough surface heating takes place, the inversion layer breaks and the surface air layers can mix upward essentially without limit. The district is characterized by frequent occurrence of strong elevated inversions. These inversions, created by atmospheric subsidence, severely limit vertical mixing, especially in the late morning and early afternoon.

3.1.3 Existing Air Quality

Air quality is determined primarily by the type and amount of contaminants emitted into the atmosphere, the size and topography of the air basin, and the meteorological conditions. The Basin has low mixing heights and light winds, which are conducive to the accumulation of air pollutants. Pollutants that impact air quality are generally divided into two categories: criteria pollutants (those for which health-based ambient standards have been set) and toxic air contaminants (those that cause cancer or have adverse human health effects other than cancer).

3.1.3.1 Criteria Pollutants

The determination of whether a region's air quality is healthful or unhealthful is determined by comparing contaminant levels in ambient air samples to national and state standards. These standards are set by the U.S. EPA and CARB at levels to protect public heath and welfare with an adequate margin of safety. National Ambient Air Quality Standards (NAAQS) were first authorized by the federal Clean Air Act of 1970. California Ambient Air Quality Standards (CAAQS) were authorized by the state legislature in 1967. Air quality of a region is considered to be in attainment of the standards (or healthful) if the measured ambient air pollutant levels are continuously equal to or less than the CAAQS and NAAQS and do not exceed the CAAQS and NAAQS more than once per year, averaged over any consecutive three-year period.

Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone (O_3), CO, nitrogen dioxide (NO_2), particulate matter less than 10 microns in PM_{10}, sulfur dioxide (SO_2), and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. CAAQS are more stringent than the federal standards, and in the case of PM_{10} and SO_2, are much more stringent. California has also established standards for sulfate, visibility, H_2S, and vinyl chloride. However, H_2S and vinyl chloride are currently not monitored in the district because these contaminants are not seen as a significant air quality problem. CAAQS and NAAQS for each of these pollutants and their effects on health are summarized in Table 3.1-4. Figure 3.1-8 identifies the locations of ambient air monitoring stations in the South Coast Air Basin.

Table 3.1-4
Ambient Air Quality Standards

Air Pollutant	State Standard	Federal Primary Standard	Most Relevant Effects
	Concentration/ Averaging Time	Concentration/ Averaging Time	
Ozone	0.09 ppm, 1-hr. avg.	0.12 ppm, 1-hr avg. 0.08 ppm, 8-hr avg.	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: 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; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. 20 ppm, 1-hr avg.	9.0 ppm, 8-hr avg. 35 ppm, 1-hr avg.	(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	0.25 ppm, 1-hr avg.	0.053 ppm, ann. avg.	(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	0.04 ppm, 24-hr avg. 0.25 ppm, 1-hr. avg.	0.03 ppm, annual avg. 0.14 ppm, 24-hr avg.	(a) Bronchoconstriction accompanied by symptoms that may include wheezing, shortness of breath, and chest tightness during exercise or physical activity in persons with asthma

Table 3.1-4 (concluded)
Ambient Air Quality Standards

Air Pollutant	State Standard	Federal Primary Standard	Most Relevant Effects
	Concentration/ Averaging Time	Concentration/ Averaging Time	
Suspended Particulate Matter (PM_{10})	30 µg/m^3, annual geometric mean 50 µg/m^3, 24-hr avg.	50 µg/m^3, annual arithmetic mean 150 µg/m^3, 24-hr avg.	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Sulfates	25 µg/m^3, 24-hr avg.	Not applicable	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardiopulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/m^3, 30-day avg.	1.5 µg/m^3, calendar quarter	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to reduce the visual range to less than 10 miles at relative humidity less than 70%, eight-hour average (10am - 6pm)	Not applicable	Visibility impairment on days when relative humidity is less than 70 percent
ppm – parts per million		µg/m^3= micrograms per cubic meter.	

The El Segundo Refinery is located within the SCAQMD Southwest Los Angeles County monitoring area. Recent background air quality data for criteria pollutants for the Southwest Los Angeles County monitoring station are presented in Table 3.1-5. Ambient air quality was compared to the most stringent guidelines of either the CAAQS or NAAQS, which were the CAAQS in all cases. These monitored data indicate that the Southwest Los Angeles County area is in compliance with the NO_2, SO_2, and lead standards for both the CAAQS and NAAQS, and the CAAQS sulfate standard.

State CO, O_3, and PM_{10} air quality standards were exceeded at the Southwest Los Angeles County air monitoring station on some days during 1996-1999 (see Table 3.1-5). The one-hour state and national CO standards were met in all years; however, the eight-hour CO standard was exceeded eight days during the four-year period. The national PM_{10} standards were met in all years. The maximum O_3 concentrations observed have remained relatively the same, whereas the maximum concentration of PM_{10} observed has decreased at this site from 107 µg/m^3 to 69 µg/m^3. The number of days with exceedances for O_3 and PM_{10} have decreased from eight to one for O_3 and increased from five to thirteen for PM_{10} over the four-year period.

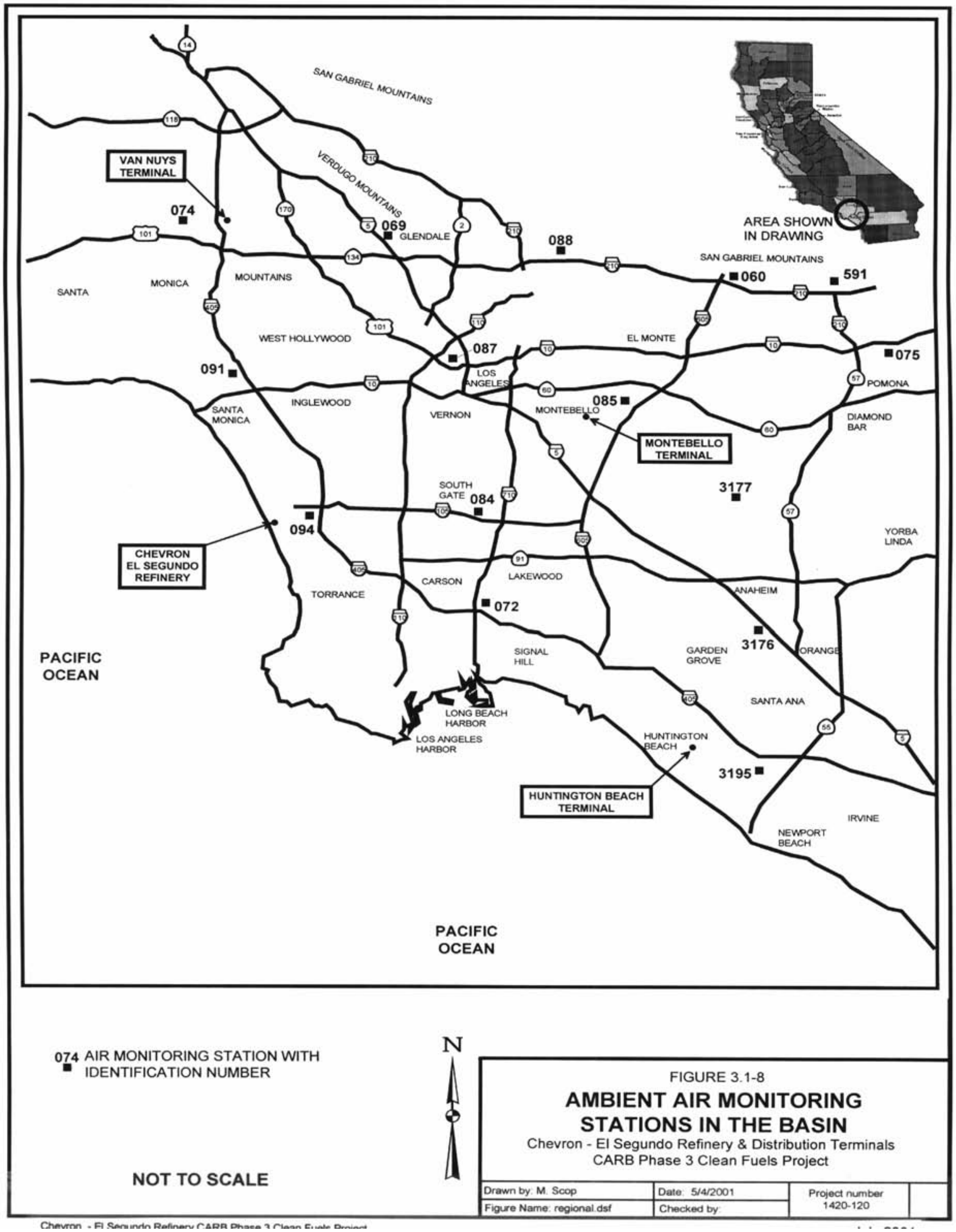


Figure 3.1-8 Ambient Air Monitoring Stations in South Coast Air Basin

Table 3.1-5
Background Air Quality Data for the
Southwest Los Angeles County Monitoring Station (ID No. 094)
(1996-1999)

Constituent	Maximum Observed Concentration (No. of Standard Exceedances - most restrictive)					
	State Standard	**Federal Standard**	**1996**	**1997**	**1998**	**1999**
Carbon monoxide 1-hour 8-hour	20.0 ppm 9.0 ppm	35.0 ppm 9.5 ppm	13 (0 day) 11.6 (6 days)	12 (0 day) 10.3 (1 day)	12 (0 day) 10.3 (1 day)	10 (0 day) 8.4 (0 days)
Ozone 1-hour	0.09 ppm	0.12 ppm	0.13 (8 days)	0.11 (6 days)	0.09 (0 day)	0.15 (1 day)
Nitrogen dioxide 1-hour Annual	0.25 ppm ---	-- 0.053 ppm	0.15 (0 day) 0.0285 ppm	0.17 (0 day) 0.0280 ppm	0.15 (0 day) 0.0295 ppm	0.13 (0 day) 0.0295 ppm
Sulfur dioxide 1-hour 24-hour Annual	0.25 ppm 0.04 ppm ---	-- 0.14 ppm 0.03 ppm	0.06 (0 day) 0.014 (0 day) 0.0025 ppm	0.10 (0 day) 0.015 (0 day) 0.0014 ppm	0.03 (0 day) 0.014 (0 day) 0.0039 ppm	0.09 (0 day) 0.020 (0 day) 0.0040 ppm
PM_{10} 24-hour	50 μg/m^3	150 μg/m^3	107 μg/m^3 (5 days)	79* μg/m^3 (4 days)	66 μg/m^3 (7 days)	69 μg/m^3 (13 days)
Annual Mean: Geometric Arithmetic	--- 30 μg/m^3	--- 50 μg/m^3	29.2 μg/m^3 32.6 μg/m^3	33.8* μg/m^3 35.5* μg/m^3	30.3 μg/m^3 32.7 μg/m^3	36.4 μg/m^3 38.9 μg/m^3
Lead 30-day	1.5 μg/m^3	--	0.04 μg/m^3 (0 months)	0.06* μg/m^3 (0 months)	0.06 μg/m^3 (0 months)	0.05 μg/m^3 (0 months)
Calendar Quarter	---	1.5 μg/m^3	0.03 μg/m^3 (0 quarter)	0.05* μg/m^3 (0 quarter)	0.04 μg/m^3 (0 quarter)	0.05 μg/m^3 (0 quarter)
Sulfates 24-hour	25 μg/m^3	---	18.4 μg/m^3 (0 day)	14.4* μg/m^3 (0 day)	13.5 μg/m^3 (0 day)	18.8 μg/m^3 (0 day)

* = Incomplete record of data; may not be representative. PM_{10} and sulfate only monitored every six days.
Reference: CARB Air Quality Data Annual Summaries 1996-1999; SCAQMD Air Quality Data Annual Summaries 1996-1999.

For NO_2, the maximum measured concentrations each year were less than the 0.25 ppm one-hour state standard and the annual federal standard. For SO_2 and lead, measured concentrations were well below both the state and federal standards. The maximum sulfate concentrations were below the state 24-hour standard each year.

The Huntington Beach Terminal is located within the North Coast Orange County monitoring station area. Recent background air quality data for criteria pollutants are presented in Table 3.1-6. Ambient air quality was compared to the most stringent of either the CAAQS or NAAQS, which were the CAAQS in all cases. These monitored data indicate that this area is in compliance with the CO, NO_2, and SO_2 standards for both the CAAQS and NAAQS.

The state O_3 air quality standard was exceeded at the North Coast Orange County air monitoring station eight days during this four-year period. The national O_3 standard was attained in all years. Data were not available for PM_{10}, sulfate, and lead at this station for these years.

The state and federal one-hour and eight-hour CO standards were not exceeded during this four-year period. For NO_2, the maximum measured concentration each year was less than or equal to the 0.25 ppm one-hour state standard and the annual federal standard.

The Montebello Terminal is located within the Southern San Gabriel Valley monitoring station area. Recent background air quality data for criteria pollutants are presented in Table 3.1-7. Ambient air quality was compared to the most stringent of either the CAAQS or NAAQS, which were the CAAQS in all cases. These monitored data indicate that this area is in compliance with the CO, NO_2, and lead standards for both the CAAQS and NAAQS. Data were not available for SO_2 and PM_{10} at this station for these years.

State and federal O_3 air quality standards were exceeded at the Southern San Gabriel Valley air monitoring station on several days each year (see Table 3.1-7). Peak O_3 concentrations have remained relatively the same over this period, whereas the number of observed exceedances of the standards has decreased from 32 to six days per year. The maximum sulfate concentrations exceeded the state 24-hour standard once in 1999.

The state and federal one-hour and eight-hour CO standards were not exceeded at this monitoring station during this four-year period. For NO_2, the maximum measured concentrations each year were less than the 0.25 ppm one-hour state standard and the annual federal standard. For lead, measured concentrations were determined to be well below the standards, when data were obtained.

Table 3.1-6
Background Air Quality Data for the North Coast Orange County Monitoring Station (ID No. 3195) (1996-1999)

Constituent	Maximum Observed Concentration (No. of Standard Exceedances - most restrictive)					
	State Standard	**Federal Standard**	**1996**	**1997**	**1998**	**1999**
Carbon monoxide						
1-hour	20.0 ppm	35.0 ppm	9 (0 day)	7 (0 day)	9 (0 day)	8 (0 day)
8-hour	9.0 ppm	9.5 ppm	7.3 (0 day)	5.8 (0 day)	7.0 (0 day)	6.4 (0 day)
Ozone						
1-hour	0.09 ppm	0.12 ppm	0.10 (1 day)	0.10 (1 day)	0.12 (5 days)	0.10 (1 day)
Nitrogen dioxide						
1-hour	0.25 ppm	---	0.14 (0 day)	0.12 (0 day)	0.12 (0 day)	0.12 (0 day)
Annual	---	0.053 ppm	0.0206 ppm	0.0199 ppm	0.0200 ppm	0.0209 ppm
Sulfur dioxide						
1-hour	0.25 ppm	---	0.01* (0 day)	0.03 (0 day)	0.02 (0 day)	0.02 (0 day)
24-hour	0.04 ppm	0.14 ppm	0.004* (0 day)	0.010 (0 day)	0.008 (0 day)	0.008 (0 day)
Annual	---	0.03 ppm	0.0001* ppm	0.0003 ppm	0.0004 ppm	0.0007 ppm
PM_{10}						
24-hour	50 µg/m^3	150 µg/m^3	No data	No data	No data	No data
Annual Mean:						
Geometric	30 µg/m^3	---		No data		
Arithmetic	___	50 µg/m^3		34.5* µg/m^3		
Lead						
30-day	1.5 µg/m^3	---	No data	No data	No data	No data
Calendar Quarter	---	1.5 µg/m^3				
Sulfates						
24-hour	25 µg/m^3	---	No data	No data	No data	No data

* = Incomplete record of data; may not be representative. PM_{10} and sulfate only monitored every six days.
Reference: CARB Air Quality Data Annual Summaries 1996-1999; SCAQMD Air Quality Data Annual Summaries 1996-1999.

Table 3.1-7
Background Air Quality Data for the Southern San Gabriel Valley Monitoring Station (ID No. 85)
(1996-1999)

Constituent	Maximum Observed Concentration (No. of Standard Exceedances - most restrictive)					
	State Standard	Federal Standard	1996	1997	1998	1999
Carbon monoxide						
1-hour	20.0 ppm	35.0 ppm	10 (0 day)	9 (0 day)	7 (0 day)	7 (0 day)
8-hour	9.0 ppm	9.5 ppm	8.1 (0 day)	6.2 (0 day)	6.1 (0 day)	5.6 (0 day)
Ozone						
1-hour	0.09 ppm	0.12 ppm	0.14 (32 days)	0.13 (18 days)	0.18 (31 days)	0.12 (6 days)
Nitrogen dioxide						
1-hour	0.25 ppm	---	0.17 (0 day)	0.15 (0 day)	0.14 (0 day)	0.16 (0 day)
Annual	---	0.053 ppm	0.0393 ppm	0.0363 ppm	0.0369 ppm	0.0391 ppm
Sulfur dioxide						
1-hour	0.25 ppm	---	No data	No data	No data	No data
24-hour	0.04 ppm	0.14 ppm				
Annual	---	0.03 ppm				
PM_{10}						
24-hour	50 µg/m^3	150 µg/m^3	No data	No data	No data	No data
Annual Mean:						
Geometric	30 µg/m^3	---				
Arithmetic	___	50 µg/m^3				
Lead						
30-day	1.5 µg/m^3	---	0.09 µg/m^3 (0 month)	0.08* µg/m^3 (0 month)	0.07 µg/m^3 (0 month)	0.21 µg/m^3 (0 month)
Calendar Quarter	---	1.5 µg/m^3	0.06 µg/m^3 (0 quarter)	0.06* µg/m^3 (0 quarter)	0.05 µg/m^3 (0 quarter)	0.09 µg/m^3 (0 quarter)
Sulfates						
24-hour	25 µg/m^3	---	13.7 µg/m^3 (0 day)	13.1* µg/m^3 (0 day)	12.0 µg/m^3 (0 day)	25.6 µg/m^3 (1 day)

* = Incomplete record of data; may not be representative. PM_{10} and sulfate only monitored every six days.
Reference: CARB Air Quality Data Annual Summaries 1996-1999; SCAQMD Air Quality Data Annual Summaries 1996-1999.

The Van Nuys Terminal is located within the Western San Fernando Valley monitoring station area. Recent background air quality data for criteria pollutants are presented in Table 3.1-8. Ambient air quality was compared to the most stringent of either the CAAQS or NAAQS, which were the CAAQS in all cases. These monitored data indicate that this area is in compliance with the NO_2 standards for both the CAAQS and NAAQS. Data were not available for SO_2, PM_{10}, lead, and sulfate at this station for these years.

Table 3.1-8
Background Air Quality Data for the
Western San Fernando Valley Monitoring Station (ID No. 074)
(1996-1999)

Constituent	Maximum Observed Concentration (No. of Standard Exceedances - most restrictive)					
	State Standard	**Federal Standard**	**1996**	**1997**	**1998**	**1999**
Carbon monoxide 1-hour 8-hour	20.0 ppm 9.0 ppm	35.0 ppm 9.5 ppm	10 (0 day) 8.5 (0 day)	12 (0 day) 9.8 (2 days)	11 (0 day) 9.3 (1 day)	9 (0 day) 7.6 (0 day)
Ozone 1-hour	0.09 ppm	0.12 ppm	0.21 (50 days)	0.12 (12 days)	0.16 (23 days)	0.10 (5 days)
Nitrogen dioxide 1-hour Annual	0.25 ppm ---	--- 0.053 ppm	0.16* (0 day) 0.0307* ppm	0.20 (0 day) 0.0260 ppm	0.14 (0 day) 0.0266 ppm	0.12 (0 day) 0.0287 ppm
Sulfur dioxide 1-hour 24-hour Annual	0.25 ppm 0.04 ppm ---	--- 0.14 ppm 0.03 ppm	No data	No data	No data	No data
PM_{10} 24-hour Annual Mean: Geometric Arithmetic	50 $\mu g/m^3$ 30 $\mu g/m^3$ ---	150 $\mu g/m^3$ --- 50 $\mu g/m^3$	No data	No data	No data	No data
Lead 30-day Calendar Quarter	1.5 $\mu g/m^3$ ---	--- 1.5 $\mu g/m^3$	No data	No data	No data	No data
Sulfates 24-hours	25 $\mu g/m^3$	---	No data	No data	No data	No data

* = Incomplete record of data; may not be representative. PM_{10} and sulfate only monitored every six days.
Reference: CARB Air Quality Data Annual Summaries 1996-1999; SCAQMD Air Quality Data Annual Summaries 1996-1999.

The O_3 air quality standards were exceeded at the Western San Fernando Valley air monitoring station on several days each year (see Table 3.1-8). The state and federal CO one-hour standards were not exceeded during this four-year period. However, the eight-hour CO standard was exceeded on two days in 1997 and on one day in 1998. The number of days that the state O_3 standard was exceeded has dropped significantly, from 50 to five days, over this period and the maximum concentrations observed have dropped from 0.21 ppm to 0.10 ppm. For NO_2, the maximum measured concentrations each year were less than the 0.25 ppm one-hour state standard and the annual federal standard.

3.1.3.2 Toxic Air Contaminants

Cancer Risk

One of the primary health risks of concern due to exposure to toxic air contaminants (TACs) is the risk of contracting cancer. Health statistics show that one in four people will contract cancer over their lifetime, or 250,000 in a million, from all causes, including diet, genetic factors, and lifestyle choices. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of causing cancer. It is currently estimated that about one in four deaths in the United States is attributable to cancer. About two percent of cancer deaths in the United States may be attributable to environmental pollution (Doll and Peto, 1981).

Noncancer Health Risks

Unlike carcinogens, it is believed that there is a threshold level of exposure to most noncarcinogens below which the compound will not pose a health risk. The California Environmental Protection Agency and Office of Environmental Health Hazard Assessment developed reference exposure levels (RELs) for TACs that are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The noncancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index.

Multiple Air Toxics Exposure Study II (MATES II) Study

The MATES II study (SCAQMD, 2000), which is the most comprehensive study of urban toxic air pollution ever undertaken, shows that motor vehicles and other mobile sources of air pollution are the predominant source of cancer-causing air pollutants in the Basin. The SCAQMD's Governing Board directed staff to undertake the MATES II study as part of the agency's environmental justice initiatives (e.g., Environmental Justice Initiative #7) adopted in late 1997. A panel of scientists from universities, an environmental group, businesses, and other government agencies helped design and guide the study. The study was aimed at determining the cancer risk from toxic air pollution throughout the area by monitoring toxics continually for one year at 10 monitoring sites. Another goal was to determine if there were any sites where TAC concentrations emitted by local industrial facilities were causing a disproportionate cancer burden on surrounding communities. To address this second goal, the SCAQMD monitored toxic pollutants at 14 sites for one month each with three mobile monitors. Monitoring platforms were placed in or near residential areas adjacent to clusters of facilities. Although no TAC hotspots were identified, models show that elevated levels can occur very close to facilities emitting TACs.

In the MATES II study, SCAQMD monitored more than 30 toxic air pollutants at 24 sites over a one-year period in 1999. The SCAQMD collected more than 4,500 air samples, and together with the CARB, performed more than 45,000 separate laboratory analyses of these samples. A similar, but less extensive study, known as MATES I, was conducted in 1986 and 1987. In each study, SCAQMD calculated cancer risk assuming 70 years of continuous exposure to monitored levels of pollutants.

The MATES II study found that the average carcinogenic risk throughout the Basin is about 1,400 in one million ($1,400 \times 10^{-6}$). Mobile sources (e.g., cars, trucks, trains, ships, aircraft, etc.) represent the greatest contributors. As shown in Figure 3.1-9, about 70 percent of all risk is attributed to diesel particulate emissions; about 20 percent to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde); and about 10 percent of all risk is attributed to stationary sources (which include industries and other certain businesses such as dry cleaners and chrome plating operations).

3.1.4 Regional Emissions Inventory

The SCAQMD compiles emissions inventories for anthropogenic sources, i.e., those associated with human activity, and natural sources such as vegetation and wind erosion. SCAQMD's current emissions inventory for the district is summarized in Table 3.1-9. The emissions inventory for the anthropogenic inventory is made up of stationary sources (both point and area sources are in this category) and mobile sources encompassing on-road and off-road mobile sources. On-road mobile sources include light-duty passenger vehicles; light-, medium-, and heavy-duty trucks; motorcycles; and urban buses. Off-road mobile sources include off-road vehicles, trains, ships, aircraft, and mobile equipment.

3.1.4.1 Criteria Pollutants Inventory

The SCAQMD emissions inventory includes district levels for the criteria air pollutants NO_x, CO, SO_x, PM_{10}, and VOC (a precursor of criteria air pollutants). Since O_3 is formed by photochemical reactions involving the precursors VOC and NO_x, it is not inventoried.

As shown in Table 3.1-9, mobile sources are the major contributors to emissions in the district, i.e., CO (99 percent), NO_x (88 percent), SO_x (77 percent), and VOC (65 percent). The presence of PM_{10} in the atmosphere is mainly attributable to entrained road dust (10 percent).

Source: MATES II Final Report, March 2000, Page ES-9

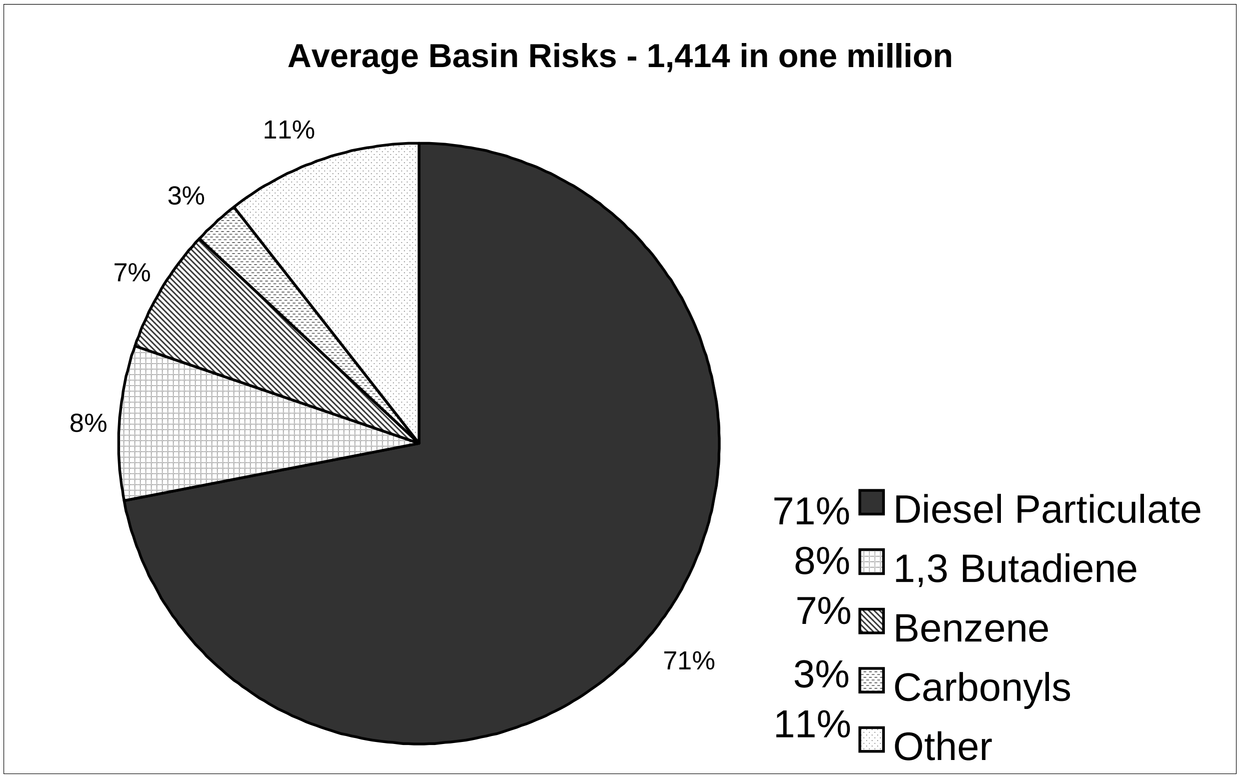


Figure 3.1.9 Major Pollutants Contributing to Cancer Risk in the South Coast Air Basin

Table 3.1-9
Sources of Criteria Pollutant Emissions Caused by Human Activities
(ton/day, annual average)

Source Category	NO_x	SO_x	CO	VOC	PM_{10}
Stationary and area sources	155.49	23.12	98.90	461.73	387.32
Mobile sources (on- and off-road)	1,134.32	75.42	8,562.40	857.27	45.36
Total	1,289.81	98.54	8,661.30	1,319.00	432.68
Source: Appendix III, 1997 AQMP					

3.1.4.2 Toxic Pollutants Inventory

The data available for toxic emissions inventories are not nearly as complete as the data for criteria pollutants. Starting in 1989, industrial facilities have been required to compile toxic emissions inventories under the Assembly Bill 2588 (AB 2588) program. Companies subject to the program are required to report their toxic emissions to the SCAQMD, which is currently reviewing the reported toxics from these companies.

The SCAQMD's first toxic air pollutant emissions inventory was compiled for 30 TACs for the year 1982 for stationary sources only. This inventory was updated during the preparation of the MATES I study and updated again for the MATES II study. This is the most up-to-date inventory prepared by the SCAQMD. A summary of the 1998 toxics emissions inventory is presented in Table 3.1-10, which provides the estimated toxic emissions for selected compounds by source category.

Table 3.1-10
1998 Annual Average Day Toxic Emissions for the South Coast Air Basin (lbs/day)

Pollutant	On-Road	Off-Road	Point	AB2588	Area	Total
Acetaldehyde[a]	5485.8	5770.3	33.9	57.1	189.1	11536.2
Acetone	4945.8	4824.7	3543.5	531.4	23447.4	37292.8
Benzene	21945.5	6533.4	217.7	266.8	2495.4	31458.8
Butadiene [1,3]	4033.8	1566.1	6.7	2.0	151.3	5759.9
Carbon tetrachloride	0.0	0.0	8.8	1.8	0.0	10.6
Chloroform	0.0	0.0	0.0	35.5	0.0	35.5
Dichloroethane [1,1]	0.0	0.0	0.0	0.1	0.0	0.1

Table 3.1-10 (concluded)
1998 Annual Average Day Toxic Emissions for the South Coast Air Basin (lbs/day)

Pollutant	On-Road	Off-Road	Point	AB2588	Area	Total
Dioxane [1,4]	0.0	0.0	0.0	105.0	0.0	105.0
Ethylene dibromide	0.0	0.0	0.0	0.2	0.0	0.2
Ethylene dichloride	0.0	0.0	4.9	17.6	0.0	22.5
Ethylene oxide	0.0	0.0	58.1	12.3	454.1	524.4
Formaldehyde[a]	16664.9	16499.3	521.6	674.7	1107.5	35468.0
Methyl ethyl ketone[a]	905.1	906.9	3240.2	385.9	14535.4	19973.5
Methylene chloride	0.0	0.0	1378.6	1673.6	9421.7	12473.9
MTBE	58428.9	2679.2	40.5	434.4	5473.7	67056.7
p-Dichlorobenzene	0.0	0.0	0.0	4.5	3735.6	3740.1
Perchloroethylene	0.0	0.0	4622.0	2249.1	22813.1	29684.2
Propylene oxide	0.0	0.0	0.0	22.3	0.0	22.3
Styrene	1114.8	287.1	447.0	3836.7	21.4	5707.0
Toluene	63187.6	11085.9	5689.6	3682.4	52246.7	135892.2
Trichloroethylene	0.0	0.0	1.1	58.0	2550.3	2609.3
Vinyl chloride	0.0	0.0	0.0	4.3	0.0	4.3
Arsenic	0.1	0.3	2.7	0.7	21.4	25.2
Cadmium	1.6	1.5	0.5	0.7	27.5	31.8
Chromium	2.4	2.3	3.9	2.2	302.2	313.0
Diesel particulate	23906.3	22386.3	0.0	5.4	815.3	47113.4
Elemental carbon[b]	27572.1	6690.3	702.8	0.0	16770.5	51735.7
Hexavalent chromium	0.4	0.4	0.3	1.0	0.1	2.2
Lead	0.7	0.9	1.9	24.5	1016.3	1044.3
Nickel	2.5	2.2	2.9	21.6	85.6	114.9
Organic carbon	16426.2	15381.8	0.0	0.0	108612.1	140420.2
Selenium	0.1	0.1	3.0	5.7	2.6	11.6
Silicon	68.6	67.6	167.2	0.0	248614.0	248917.4

Source: Final MATES II Study, SCAQMD (March 2000).
[a] Primarily emitted.
[b] Including elemental carbon from all sources, including diesel particulates.

3.2 Biological Resources

The Initial Study determined that the potential for impacts to biological resources at or in the immediate vicinity of the Refinery and Huntington Beach Terminal would be addressed in the EIR. No potential biological resources were identified at or in the immediate vicinity of the Van Nuys or Montebello Terminals; thus, the following biological resources discussion is limited to the Refinery and Huntington Beach Terminal sites and surrounding vicinity.

Biological resources potentially affected by the proposed project can include vegetative communities, wildlife, and associated wildlife habitats that may be located on or near the Refinery and Huntington Beach Terminal. Both of these project sites are located in coastal areas near the Pacific Ocean. Review of the California Department of Fish and Game, California Natural Diversity Database (CNDDB) overlay maps indicates that three species of concern are listed as having been found on or near the Refinery property and one monitored species[1] is listed as having been found on or near the Huntington Beach Terminal.

3.2.1 Refinery

The three species of concern identified by the CNDDB as occurring near the Refinery are the El Segundo blue butterfly (*Euphilotes battoides allyni*), Pacific pocket mouse (*Perognathus longimembris pacificus*), and the beach spectaclepod (*Dithyrea maritima*). The official status, habitat requirements, and occurrence information are provided below for each of the three species identified by the CNDDB.

El Segundo Blue Butterfly

This species is a small, brilliantly colored butterfly historically occurring in the El Segundo sand dunes of Los Angeles County (U.S. Fish and Wildlife Service, 1997). The El Segundo blue butterfly was federally listed as an endangered species in 1976 because of extensive habitat loss, degradation, and fragmentation. All life stages of the El Segundo blue butterfly feed on the same plant: the coastal buckwheat (*Eriogonum parvifolium)*. The main population of the El Segundo blue butterfly species is found on the sand dunes located on Los Angeles International Airport property. Smaller populations are present in the butterfly park at the Refinery and at Malaga Cove, Palos Verdes Peninsula.

Figure 3.2-1 illustrates the location of the El Segundo blue butterfly sanctuary at the Refinery, using a portion of the Venice 7.5" United States Geological Survey topographic map. The sanctuary measures approximately 1.3 acres and was established by Chevron in approximately 1976 at the request of local entomologists who had observed the presence of coastal buckwheat and the El Segundo blue butterfly in this undeveloped portion of the Refinery property.

Because of the sanctuary's small size and proximity to urban development, various invasive weeds and annual grasses continually colonize the site (Arnold, 1999). Habitat restoration activities conducted on an annual basis include the removal of various non-native plant species in portions of the dunes and plantings of native species to improve habitat quality (Arnold, 1999).

1 Although not a state or federally listed species, the monarch butterfly is monitored by the California Department of Fish and Game due to unique habitat requirements for their wintering sites (McGriff, 2001).

Additionally, annual transect counts to monitor the El Segundo blue butterfly populations are conducted at the Refinery sanctuary.

Pacific Pocket Mouse

This species is a small, brownish rodent endemic to coastal southwestern California. It was listed by the U.S. Fish and Wildlife Service as endangered in 1994. The Pacific pocket mouse thrives in fine-grain sandy areas of the immediate vicinity of the Pacific Ocean. The mouse inhabits coastal strand, coastal dunes, river alluvium, and coastal sage scrub growing on marine terraces (Center for Biological Diversity, 2001). Historically, the Pacific pocket mouse range extended from Los Angeles County south to the Mexican border. Currently, the only populations of the Pacific pocket mouse that are known to exist are located at the Dana Point Headlands in Orange County and within the boundaries of the Camp Pendleton Marine Base in San Diego County (Dempton, 1994). The CNDDB overlay map shows the historic range of this species, including portions of the Refinery. However, the CNDDB occurrence report for the Pacific pocket mouse indicates that this species was last seen in the area of the Refinery in 1938. As a result, this species is not expected to exist at the Refinery.

Beach Spectaclepod

This species is a small, low-growing perennial herb that is native to California and occurs in foredunes, active sand, and dune scrub from San Luis Obispo to Baja California. It is ranked by the California Native Plant Society as extremely rare, is listed by the state of California as threatened, and is a federally listed Species of Concern. The CNDDB overlay map shows the historic range of this species (including portions of the Refinery) because the CNDDB occurrence report for the beach spectaclepod indicates that the only information for this site is an 1884 sighting reported to the CNDDB in 1979. As a result, this species is not expected to exist at the Refinery.

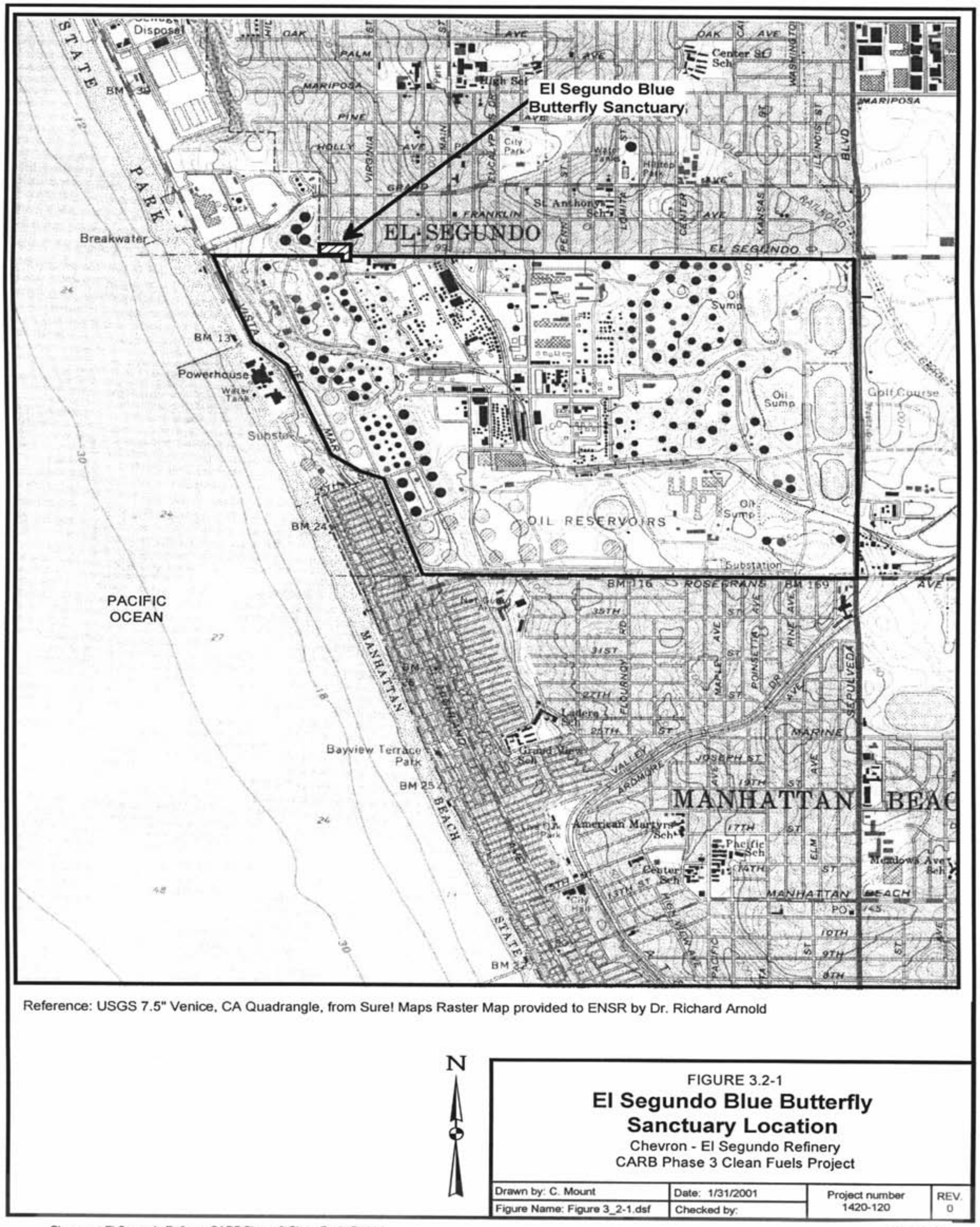


Figure 3.2-1 – El Segundo Blue Butterfly Sanctuary Location

3.2.2 Huntington Beach Terminal

The only species identified by the CNDDB on or near the Huntington Beach Terminal is the monarch butterfly (Danaus plexippus). The monarch butterfly roosts in various sites along the California coast from northern Mendocino County to Baja California during its winter migration. The butterfly roosts in wind-protected groves of eucalyptus, Monterey pine, cypress, and coast live oak, with nectar and water sources nearby (CNDDB, 2000). The CNDDB occurrence listing indicates that the monarch butterfly is known to occur in two areas, near the Huntington Beach Terminal, including a eucalyptus grove near the amphitheater in the eastern portion of Huntington Beach Central Park and in the exotic trees and shrubbery of the Huntington Beach Central Park parking lot located on Gothard Street. These two occurrence areas are located ¼-mile north of the terminal's northern property boundary. In addition, no trees are located on the terminal property; therefore, the site would not be used by migrating monarchs. Based on these considerations, this species is not expected to exist at the Huntington Beach Terminal.

3.3 Cultural Resources

As a result of the ground-disturbing activities required for the proposed project, the Initial Study determined that the presence or absence of archaeological and/or paleontological resources at the project sites should be confirmed. Therefore, records searches were conducted for the project site locations at the South Central Coastal Information Center (SCCIC) and the Native American Heritage Commission (NAHC). The cultural setting of the project site locations and the results of the records searches are described in this section.

3.3.1 Resource Identification

3.3.1.1 California Environmental Quality Act

The State of California has formulated laws for the protection and preservation of archaeological resources. Generally, a cultural resource shall be considered to be "historically significant" if the resource meets the criteria for listing on the California Register of Historic Resources (Public Resources Code §5024.1, Title 14 California Code of Regulations [CCR], §4852) including the following:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2. Is associated with the lives of persons important in our past;

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

4. Has yielded, or may be likely to yield, information important in prehistory or history.

The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to §5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in §5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be a historical resource as defined in Public Resources Code §5020.1(j) or 5024.1.

If the project may cause damage to a significant cultural resource, the project may have a significant effect on the environment. CEQA Guidelines §15064.5 pertains to the determination of the significance of impacts to archaeological and historic resources. CEQA provides guidelines for administering to archaeological resources that may be adversely affected by project development in §15126.4. Achieving CEQA compliance with regard to treatment of impacts to significant cultural resources requires that a mitigation plan be developed for the resource(s). Preservation in place is the preferred manner of mitigating impacts to archaeological resources.

3.3.1.2 California Register of Historical Resources

Drafted in 1995, the California Register of Historical Resources provides proposed guidelines for the nomination of properties to the California Register. The California Register is an authoritative guide to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate which properties are to be protected, to the extent prudent and feasible, from substantial adverse change. The criteria for listing resources on the California Register are based on those developed by the National Park Service for listing on the National Register of Historic Places with modifications in order to include a broader range of resources that better reflect the history of California. No listed sites exist at any of the project locations.

3.3.1.3 California Public Resources Code

California Public Resources Code §5097.9 stipulates that it is contrary to the free expression and exercise of Native American religion to interfere with or cause severe irreparable damage to any Native American cemetery, place of worship, religious or ceremonial site, or sacred shrine.

3.3.1.4 California Health and Safety Code

If human remains are exposed during construction, State Health and Safety Code §7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code §5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the NAHC.

The NAHC will then contact the most likely descendent of the deceased Native American, who will serve as a consultant on how to proceed with the remains.

3.3.2 Ethnographic Setting

The project sites lie within the historic territory of the Native American group known as the Gabrielino or Tongva, one of the wealthiest, most populous, and most powerful ethnic nationalities in aboriginal southern California (Bean and Smith, 1978). The native word Tongva has been used to designate what were previously called Gabrielino speakers and is a preferred designation by many people native to the area (King, 1994). The Tongva/Gabrielino followed a sophisticated hunter-gatherer lifestyle, and were a deeply spiritual people (McCawley, 1996). Their historic territory included the Los Angeles Basin (which includes the watersheds of the Los Angeles, San Gabriel, and Santa Ana Rivers), the coast from Aliso Creek in coastal Orange County to Topanga Creek in Los Angeles County, and the four southern Channel Islands. Prior to the arrival of the Tongva/Gabrielino's Shoshonean-speaking ancestors into southern California, the archaeological record indicates that sedentary populations occupied the coastal regions of California more than 9,000 years ago (Erlandson and Colten, 1991).

3.3.3 Record Search Results

An archival record search for the project sites was conducted at the SCCIC in November 2000 by Conejo Archaeological Consultants of Thousand Oaks, California. Conejo Archaeological Consultants also conducted a record search of the NAHC's sacred lands file in December 2000. The records search of the sacred lands file did not indicate the presence of Native American cultural resources on or near the project sites. A summary of the findings of the records search conducted at the SCCIC is provided below. A professional report of the findings of the records searches is included in Appendix C.

Refinery

The records search results indicated that there are no prehistoric or historic archaeological sites within a ¼-mile radius of the Refinery. Three archaeological studies have been conducted within a ¼-mile radius of the Refinery. Of these, one was completed within the Refinery boundaries. This study covered a linear portion of the Refinery along the railroad tracks that run in an east-west direction through the central portion of the Refinery property (Peak and Associates, 1992). No archaeological sites were found during the study of the railroad tracks at the Refinery. The majority of the Refinery has not been subject to previous archaeological investigation.

The California State Historic Resources Inventory, National Register of Historic Places, California Historical Landmarks (1996), California Points of Historical Interest (1992), and the City of Los Angeles Historic Cultural Monuments were checked as part of the records search conducted at the SCCIC. No sites within the Refinery property boundaries or within a ¼-mile radius of the Refinery were included on these lists.

Montebello Terminal

The records search indicated that the Montebello Terminal has not been subject to previous archaeological investigation and that no prehistoric or historic archaeological sites have been identified on or within a ¼-mile radius of the terminal. One archaeological survey was previously conducted within a ¼-mile radius of the terminal site, but it did not include or border the terminal and did not uncover prehistoric or historic resources. The railroad right-of-way adjacent to the north of the terminal site was identified as a historic resource due to the age of the structure. However, the proposed terminal modifications/additions will not extend offsite, so no disturbance of the railroad right-of-way would occur.

The California State Historic Resources Inventory, National Register of Historic Places, California Historical Landmarks (1996), California Points of Historical Interest (1992), and the City of Los Angeles Historic Cultural Monuments were checked as part of the records search conducted at the SCCIC. No sites within the Refinery property boundaries or within a ¼-mile radius of the Refinery were included on these lists.

Van Nuys Terminal

Five archaeological studies have been conducted within a ¼-mile radius of the Van Nuys Terminal. Of these, one may have extended onto the terminal site, but the survey map was unclear due to insufficient locational information. A linear survey of the railroad right-of-way, which borders the terminal to the north, was completed by W&S Consultants in 1996. The majority, if not all of the terminal site, has not been subject to previous archaeological investigation. The records search results indicate that there are no prehistoric or historic archaeological sites within the terminal boundaries or within a ¼-mile radius of the terminal.

The California State Historic Resources Inventory, National Register of Historic Places, California Historical Landmarks (1996), California Points of Historical Interest (1992), and the City of Los Angeles Historic Cultural Monuments were checked as part of the records search conducted at the SCCIC. No sites within the terminal property boundaries or within a ¼-mile radius of the terminal were included on these lists.

Huntington Beach Terminal

Three prehistoric sites, 30-000142, 30-000359, and 30-000372/595, have been identified within a ¼-mile radius of the Huntington Beach Terminal. The western half of 30-000372 (CA-ORA-372) is located within the southeastern portion of the terminal. CA-ORA-372 was recorded by T.

Cooley and A. Marquette in 1972, and is described as a “dark shelly midden” that has been “pretty well destroyed” by grading associated with the construction of an oil tank. No historic archaeological sites are recorded within a ¼-mile radius of the terminal.

Four archaeological surveys/excavations have been conducted within a ¼-mile radius of the terminal, including one survey that covers most of the City of Huntington Beach, and the entire terminal (Archaeological Research, Inc., 1973). The 1973 survey report is not clear as to whether the terminal was ever subject to actual archaeological reconnaissance and does not meet current professional standards. The 1973 report concludes:

> *Ora-363: This is a small, probably displaced piece of midden on the northern boundary of the Standard Oil [now Chevron] retail tank farm, near Gothard and Talbert. No further work is deemed necessary (Archaeological Research, Inc. 1973: 19).*

In 1974, Tadlock conducted an excavation of the portion of site CA-ORA-375/595 located just outside the terminal’s eastern boundary, along Gothard Street. Within the Gothard Street right-of-way no artifacts were found and only marine shell was recovered, most of which appeared to be in a disturbed context (Tadlock, 1974:20).

The California State Inventory lists no properties that have been evaluated for historical significance within or adjacent to the Huntington Beach Terminal. The listings of the National Register of Historic Places, California Historical Landmarks (1996), and California Points of Historical Interest (1992) include no properties with a ¼-mile radius of the Huntington Beach Terminal.

3.4 Geology and Soils

Construction activities at each of the four project sites are limited to moderate amounts of excavation or grading. Most of the activities will include the addition or modification of piping and tankage. The following discussion presents the geologic, structural, and soils setting of the sites and addresses potential geological hazards.

3.4.1 Geologic Setting

3.4.1.1 Refinery and Huntington Beach Terminal

Both the Refinery and the Huntington Beach Terminal are located on the coastal plain of the Los Angeles Basin. The Los Angeles Basin is a northwest-trending lowland plain that is roughly 50 miles long by approximately 20 miles wide. Structurally, the Los Angeles Basin has been divided into four major subdivisions: the southwestern block, the northwestern block, the central block, and the northeastern block. The Refinery and the Huntington Beach Terminal are located in the southwestern block. The surface of this block is a low plain floored with sediments that extends south from the Santa Monica Mountains and includes the offshore submerged San Pedro Shelf. The line of hills and mesas that lie along the Newport-Inglewood Fault Zone defines the inland margin of this block. The lowland surface of the Los Angeles Basin slopes gently southward and westward to the Pacific Ocean.

Typical of coastal environments, the Refinery is underlain by Holocene deposits, locally called the El Segundo sandhills. The underlying soils comprise poorly graded beach sands and silty sands (Yerkes et. al, 1965). The groundwater is at least 70 feet below the ground surface. The groundwater beneath the site is of poor quality due to saltwater intrusion and is not designated as a potential potable water source.

3.4.1.2 Montebello Terminal

The Montebello Terminal is located in the Los Angeles Basin on the Downey Plain. The site is underlain by Holocene alluvial deposits, in an area of gently uplifted and dissected Pleistocene sediments of an older fan system. The older alluvial sediments that underlay the site consist of alternating beds of dense to very dense sand, clay, and silts (Yerkes et. al, 1965). The site is drained by the Rio Honda drainage course located less than one mile to the east. Groundwater beneath the site is approximately 30 feet below ground surface (bgs) and flows generally to the southwest.

3.4.1.3 Van Nuys Terminal

The Van Nuys Terminal is located in the central portion of the San Fernando Valley southwest of the Verdugo Mountains. The San Fernando Valley is located within the Transverse Ranges geological province. The valley is a broad, east-west trending, alluvial-filled syncline that is drained by the Los Angeles River and its tributaries. Thickness of the underlying alluvium ranges to over 650 feet in the east central portion of the valley (Yerkes and Wentworth, 1971).

The Van Nuys Terminal is located overlying undifferentiated Holocene alluvial deposits of gravels, sand, and clay (Dibblee, 1991). Groundwater in the San Fernando Valley generally flows along a gradient that subparallels the ground surface topography, which slopes toward the Los Angeles River. Groundwater beneath the Van Nuys Terminal is generally shallow, less than 40 feet bgs.

3.4.2 Structural Setting

3.4.2.1 Seismicity

Southern California is a seismically active area for which there are good-to-excellent historic records available for the last 150 to 200 years. Instrumental seismic records are available for the past 50 years. Earthquake magnitudes are expressed using the Richter scale, a logarithmic scale generally ranging from 0 to slightly less than 9.0.

There is a strong correlation between the distribution of seismic events and the location of major faults. This correlation is particularly true for events greater than Richter magnitude 6.0. The proximity of major faults to the project locations increases the probability that an earthquake of magnitude 6.0 or greater may affect the project site. A Richter magnitude 7.0 or higher earthquake would be capable of adversely affecting most existing structures in the project vicinity.

Refinery and Huntington Beach Terminal

The Refinery and the Huntington Beach Terminal are located in areas of well-known historic seismic activity, and are subject to the effects of moderate to large seismic events. Historic seismic records (California Department of Conservation – Division of Mines and Geology [CDMG], 2000]) indicate that between 1932 and 2000, over 30 earthquakes of Richter magnitude 5.0 or greater have occurred within 50 miles of the sites. Approximately 35 active faults are also known to exist within a 50-mile radius of the Refinery and the Huntington Beach Terminal (Jensen, 1994). Of primary concern to the Refinery are two active faults: the Newport-Inglewood Fault, approximately five miles north of the site, and the Palos Verdes Fault, approximately 3.8 miles south of the site. Of most significance to the Huntington Beach Terminal is the Newport-Inglewood Fault, located 1.5 miles north of that site.

The Newport-Inglewood Fault Zone dominates the geologic structure of the area encompassing the Refinery and the Huntington Beach Terminal, and represents the most significant potential source of strong ground shaking for these sites. The northwest-trending Newport-Inglewood Fault Zone is over 40 miles long and is marked at the surface by low eroded scarps along an echelon (i.e., parallel, but staggered) faults and by a northwest-trending chain of elongated low hills and mesas that extend from Newport Bay to Beverly Hills (CDMG, 1998). The orientation of the structural elements of the zone is generally attributed to right-lateral, strike-slip faulting at depth.

The greatest concentration of seismic events has resulted from activity on the Newport-Inglewood Fault Zone and is primarily related to the 1933 Long Beach earthquake and its aftershocks. The occurrence of numerous earthquakes along the Newport-Inglewood Fault Zone in historic time graphically demonstrates the Holocene (≤ 11,000 years old) activity of the structure. Most notable of these is the magnitude 6.3 Long Beach earthquake, which occurred in 1933. Within the past 30 years, an annual average of between two and three local earthquakes in the magnitude range of 3.0 to 4.5 have been recorded at various locations along the zone. The fault is capable of generating a 6.9 maximum moment magnitude earthquake. Slip rate on the fault is estimated to be 1.00 millimeter per year.

Another potentially significant fault in the immediate area of the Refinery and Huntington Beach Terminal is the Palos Verdes Fault Zone. The Palos Verdes Fault is a right-lateral oblique-slip fault extending approximately 72 miles from Santa Monica Bay south to Lausen Knoll in the southern San Pedro Channel. This fault is capable of a 7.1 maximum moment magnitude earthquake. The slip rate is estimated to be 3.0 millimeters per year.

Montebello Terminal

The Montebello Terminal is located in an area of well-known seismic activity. Of primary concern is the Whittier Fault, the northwest terminus of which is located approximately four miles east of the site. The Whittier Fault is a right-lateral strike-slip fault, about 25 miles in length. As a result of its proximity to the site, this geologic structure is considered to be the most likely source for future significant seismic events at the Montebello Terminal site.

The most recent seismic activity in the immediate vicinity of the Montebello Terminal was the Whittier Narrows Earthquake, a Richter magnitude 5.9 event, which involved the Whittier and the Puente Faults.

Van Nuys Terminal

The Van Nuys Terminal is located in an area of well-known seismic activity. Historic seismic records (CDMG, 1999) indicate that between 1932 and 2000, over 37 earthquakes of Richter magnitude 5.0 or greater have occurred within 50 miles of the site. Approximately 35 active faults are also known to exist with a 50-mile radius of the Van Nuys Terminal (Jennings, 1994). Of primary concern are faults located within 10 miles of the Van Nuys Terminal: the Verdugo Fault, the Oak Ridge Fault, the Sierra Madre-San Fernando Fault, and the Northridge Hills Fault. As a result of their proximity, these geologic structures are considered to be the most likely sources for significant seismic effects at the Van Nuys Terminal site.

The greatest concentration of local seismic events has resulted from activity on the Oak Ridge Fault (primarily related to the 1994 Northridge earthquake) and activity on the Sierra Madre-San Fernando Fault (related to the 1971 San Fernando earthquake).

3.4.2.2 Important Historic Earthquakes/Earthquake Probability

By 1998 the CDMG had completed a seismic hazard evaluation study of the areas encompassing the project sites (CDMG, 1998). The CDMG evaluation forms the basis for the following discussion on seismic hazards. Available historic local and regional seismic records were compiled and used to develop defensible and site-specific seismic hazard analyses. The hazard analysis, in particular, was designed to predict earthquake-induced ground motions capable of causing ground failure (liquefaction, landslides) for the area including the project sites.

In the CDMG hazard evaluation, the ground-shaking levels for the project sites were estimated for each of the sources (local or regional faults capable of generating an earthquake) included in the seismic source model using attenuation relations that relate earthquake shaking with magnitude, distance from the earthquake, and type of fault rupture (strike-slip, reverse, normal, or subduction).

In the hazards evaluation, the CDMG included the hazards associated with ground motion exceeding peak horizontal ground acceleration at 10 percent probability of exceedance in 50 years (CDMG, 1998). Table 3.4-1 summarizes the CDMG calculated estimates for probable ground motion and the maximum magnitude of a causative earthquake at the project sites.

Table 3.4-1
Ground Motion and Maximum Magnitude Estimates for the Project Sites

Site	Ground Motion (ground acceleration) (10% probability of exceedance in 50 years)	Maximum Earthquake Magnitude (distance in kilometers)	Source
Refinery	0.45 g (in alluvium)	7.1 (2 km)	CDMG 1998, Seismic Hazard Evaluation, Venice Quadrangle, Los Angeles County, CA
Montebello Terminal	0.44 g (in alluvium)	6.7 (2 km)	CDMG 1998, Seismic Hazard Evaluation, South Gate Quadrangle, Los Angeles County, CA
Van Nuys Terminal	0.50 g (in alluvium)	6.6-6.9 (2 km)	CDMG 1998, Seismic Hazard Evaluation, San Fernando Quadrangle, Los Angeles County, CA
Huntington Beach Terminal	0.42 g (in alluvium)	6.8 (2 km)	CDMG 1998, Seismic Hazard Evaluation, Los Alamitos Quadrangle, Los Angeles County, CA

3.4.2.3 Ground Rupture - Earthquake Zoning

The Alquist-Priolo Special Studies Zones Act specifies that an area, termed an "Earthquake Fault Zone," is to be delineated surrounding faults that are deemed "sufficiently active" or "well defined" after a review of seismic records and geological studies. This legislation was passed to prohibit the location of most structures for human occupancy across the traces of active faults and to mitigate the hazard of earthquake-induced ground rupture. Cities and counties affected by earthquake fault zones must regulate certain existing and development projects within the zones by permitting and building code enforcement (CDMG, 2000).

El Segundo Refinery and Huntington Beach Terminal

Both the Refinery and Huntington Beach Terminal are located near the Newport-Inglewood Fault, the trace of which has been designated as a special studies zone. However, neither site overlies the designated fault trace as designated by mapping and site investigations conducted as part of the Alquist-Priolo Act.

Montebello Terminal

Although located in an acknowledged seismically active area, the Montebello Terminal is not located on a fault trace as designated by mapping and site investigations conducted as part of the Alquist-Priolo Act.

Van Nuys Terminal

Although located in an acknowledged seismically active area, the Van Nuys Terminal is not located on a fault trace as designated by mapping and site investigations conducted as part of the Alquist-Priolo Act.

3.4.2.4 Subsidence

The four component sites of this project have not been affected by significant historic ground subsidence, nor are they expected to experience significant subsidence in the future.

3.4.3 Soils (Surficial Geology)

Typical of coastal environments, the Refinery is underlain by Holocene deposits, locally called the El Segundo sandhills. The underlying soils comprise poorly graded beach sands and silty sands.

The Huntington Beach, Montebello, and Van Nuys Terminals are all located on undifferentiated Holocene alluvial deposits of gravels, sand, silts, and clay.

3.4.3.1 Expansive Soils

Expansive soils have the ability to shrink and swell with wetting and drying. The shrink-swell capacity of expansive soils can result in differential movement beneath foundations. Investigation of the four project sites indicates that the majority of the near-surface soils are granular in nature. Accordingly, the expansion potential of site soils is anticipated to be low.

3.4.3.2 Soil Liquefaction

Soil liquefaction is a phenomenon in which saturated, cohesionless soils (sand) temporarily lose their strength and liquefy when subjected to dynamic forces such as intense and prolonged ground shaking. Liquefaction typically occurs when the water table is less than 40 feet bgs and the soils are predominantly granular and unconsolidated. The potential for liquefaction increases as the groundwater approaches the surface. Recent analysis of seismic hazards in California by the CDMG indicates that of the four sites, only the Van Nuys Terminal site is an area where historic occurrence of liquefaction indicates a potential for permanent ground displacements (CDMG, 1999).

3.4.3.3 Landslides

Landslides involve the downslope movement of masses of soil and rock material under gravity. Landslides can be caused by ground shaking, such as earthquakes, or heavy precipitation events. Generally, landslides occur on the sideslopes of mountains comprised of sedimentary materials. Sedimentary rocks are particularly susceptible to landslides because they often contain relatively less competent beds of clays and other fine-grained rocks interbedded with more competent beds of sand and gravel.

Recent analysis of seismic hazards in California by the CDMG indicates that none of the four project locations is considered to be in an earthquake-induced landslide zone (CDMG, 1999).

3.5 Hazards and Hazardous Materials

In general, hazard impacts are not a discipline with specific environmental characteristics that can be easily described or quantified. Instead, hazard impacts typically consist of random, unexpected accidental occurrences that may create adverse effects on human health or the environment.

This section describes features of the existing environment as they relate to the risk of a major accident occurring at the Refinery and the terminals. Factors that are taken into consideration to determine the magnitude of the risk of an upset event are:

- the impact of the event;
- the types of materials potentially involved in the upset event; and
- the location of sensitive receptors, e.g., residences, schools, and businesses.

3.5.1 Applicable Hazards Regulations

The following discussion describes laws and regulations affecting the proposed project and the management of risk associated with process upsets.

A variety of safety laws and regulations have been in existence for many years to reduce the risk of accidental releases of chemicals at industrial facilities. Initially, the federal government passed legislation to enhance emergency planning efforts in Title III of SARA. Next, the U.S. EPA developed Emergency Preparedness and Community Right-to-Know regulations.

OSHA passed a rule in 1992, known as Process Safety Management of Highly Hazardous Chemicals (29 CFR 1910.119), which addresses the prevention of catastrophic accidents. The rule requires companies handling hazardous substances in excess of specific threshold amounts to develop and implement process safety management (PSM) systems. The requirements of the PSM rule are directed primarily at protecting workers within the facility. One of the key components of the required PSM systems is the performance of process hazard analyses. The process hazard analyses are assessments to anticipate causes of potential accidents and to improve safeguards to prevent these accidents.

In California, Assembly Bill 3777 first required facilities handling Acutely Hazardous Materials (AHMs) to establish Risk Management Prevention Programs (RMPPs) in 1986. The objective of these regulations was to identify facilities that handle AHMs above certain threshold limits and to require these facilities to develop RMPPs to address the potential hazards involved. The RMPPs were intended to identify hazards involving AHMs, evaluate potential consequences of releases, and identify recommended changes in equipment, training, operating, and maintenance procedures, mitigation systems, and emergency response plans to minimize both the potential for these releases and their effects should they occur. The California Office of Emergency Services (OES) published guidelines for preparing RMPPs in November 1989 (OES, 1989). In some cases, administering agencies (usually cities or counties responsible for emergency response and preparedness) have issued additional guidance. The RMPP program has been replaced with the California Accidental Release Prevention (CalARP) Program discussed below.

The U.S. EPA established a federal Risk Management Program (RMP) under the Clean Air Act Amendments (CAAA), which were passed in November 1990. The CAAA mandated that U.S. EPA create regulations to require facilities possessing and/or storing listed chemicals above specified threshold amounts to develop and implement RMPs. The RMPs contain a hazard assessment of potential worst-credible accidents, an accident prevention program, and an emergency response program. Federal regulations were promulgated for RMPs in June 1996. The Federal RMP was provisionally accepted by California in January 1997 to replace the California RMPP and California regulations. The CalARP program was finalized by June 1997, as

California's version of the RMP. RMP/CalARP regulations require that risk management programs be completed for affected processes by the time a listed substance exceeds the threshold quantity in process for the first time.

3.5.2 Types of Onsite Hazards and Release Scenarios

Based on a review of the existing Refinery and terminal operations and processes, the greatest potential for an upset condition to occur that would affect the public would result from the ignition or explosion of flammable material. The most likely flammable materials to have an offsite impact would be pentane, gasoline, or ethanol, which are flammable liquids stored in large quantities at the Refinery and the terminals. Both radiant heat and blast over-pressures could result from ignition of flammable liquids, particularly pentane. Other events that could have offsite impacts are an ethanol release and fire due to a tank truck accident or a pentane explosion or fire due to a rail car accident. These types of events are the most likely to occur in an environment such as a refinery and its associated terminals and therefore establish a basis for analysis (SCAQMD, 1993).

The Refinery also has prepared a RMP for the hazardous materials, butane, pentane, and ammonia that are currently used in refinery processes. Modifications under RMP and CalARP will be required for the new butane and pentane processes associated with the proposed project. The City of El Segundo Fire Department administers this program for the Refinery. In addition, the Refinery has prepared an emergency response manual, which describes the emergency response procedures that would be followed in the event of any of several release scenarios and the responsibilities for key response personnel.

Chevron currently adheres to the following safety design and process standards:

- The California Health and Safety Code Fire Protection specifications.
- The design standards for petroleum refinery equipment established by American Petroleum Institute, American Society of Mechanical Engineers, the American Institute of Chemical Engineers, the American National Standards Institute, and the American Society of Testing and Materials.
- The applicable Cal-OSHA requirements.

Chevron maintains its own emergency response capabilities, including onsite equipment and trained emergency response personnel who are available to respond to emergency situations anywhere within the Refinery.

3.6 Hydrology/Water Quality

Water issues in the Los Angeles and Santa Ana Basins are complex and affect supply, demand, and quality of water for domestic, commercial, industrial, and agricultural use. Elements of both the regional and local hydrologic environment are presented in this section.

3.6.1 Water Supply

3.6.1.1 Los Angeles Basin

Since 1900, extensive water development has been carried out in the Los Angeles Basin. The Los Angeles Aqueduct, which imports water from the Owens Valley, was completed in 1913 and extended to the Mono Lake Basin in 1940. Due to restrictions on diversions from the Mono Basin and Owens Valley, the amount of water that can be diverted to the Los Angeles area has been reduced.

The Colorado River Aqueduct, which now provides approximately 25 percent of the region’s water supply, was completed in 1941. Contracts allow the diversion of 1.21 million acre-feet per year to the Los Angeles area.

In an average year, 75 percent of the water used in the Los Angeles area comes from the eastern Sierras via the Los Angeles Aqueduct. Wells in the San Fernando Valley and other local groundwater basins supply approximately 15 percent of the water.

Annually, approximately 628,000 acre-feet of water are provided to the Los Angeles area. About two-thirds of the water demand is for residential uses. About one-quarter of the demand is for commercial and governmental uses. Therefore, industrial use represents a small part of the overall water use.

3.6.1.2 Santa Ana Basin

Both the Colorado River Aqueduct and the California Water Project deliver water to the Santa Ana Region. In addition, a Santa Ana River Watermaster guarantees minimum average annual flows and quality from the San Bernardino area to the lower basins. This water can consist of wastewater, imported water, and/or dry weather runoff. The Santa Ana River transports more than 125 million gallons per day of reclaimed water from Riverside and San Bernardino counties for recharge into the Orange County Groundwater Basin. This satisfies approximately 40 percent of the county’s water demand.

3.6.1.3 Refinery

The Refinery consumed approximately 12 million gallons of water per day in 2000. Approximately 8.5 million gallons per day of raw water, which is purchased from the Metropolitan Water District of Southern California, were used. In addition, 3.5 million gallons per day of reclaimed water, which is purchased from the West Basin Municipal Water District (WBMWD), were consumed. The WBMWD applies tertiary treatment to the secondary-treated effluent from the City of Los Angeles Hyperion Treatment Plant.

Raw water is typically used for boiler makeup water, cooling towers, fire water, and potable water. Approximately 200,000 gallons of reclaimed water per day are used for irrigation, and approximately three million gallons per day of nitrified reclaimed water are used for the cooling towers.

3.6.1.4 Terminals

Minimal water is used by the three terminal operations. Truck washing activities at the Van Nuys and Montebello facilities account for most of the water use at those sites. There are no truck washing activities at the Huntington Beach Terminal.

3.6.2 Water Quality

Extensive urbanization in the area has resulted in significant alteration and deterioration of the natural hydrologic environment. Presently, surface runoff at the project locations flows into a network of storm drains that empty into several large rivers and a complex of manmade channels. Due to extensive paving and surfacing of the land throughout the area, groundwater recharge by infiltration has steadily decreased while pumping has increased.

3.6.2.1 Surface Water Quality

The primary objective of the Federal Water Pollution Control Act, otherwise known as the CWA, is to restore and maintain the chemical, physical, and biological integrity of the nation's surface waters. Pollutants regulated under the CWA include "priority" pollutants, including various toxic pollutants; "conventional" pollutants, such as biochemical oxygen demand (BOD), total suspended solids (TSS), oil and grease, and pH; and "nonconventional" pollutants, including any pollutant not identified as either conventional or priority.

The CWA regulates both direct and indirect discharges. The NPDES Program (CWA §502) controls direct discharges into waters of the U.S. NPDES permits contain industry-specific, technology-based limits and may also include additional water quality-based limits, and establish pollutant monitoring requirements. A NPDES permit may also include discharge limits based on federal or state water quality criteria or standards.

In 1987, the CWA was amended to require a program to address stormwater discharges. In response, the U.S EPA promulgated the NPDES stormwater permit application regulations.

California received U.S. EPA approval of its NPDES permit program on May 14, 1973. Pursuant to §402(p) of the CWA and 40 CFR Parts 122, 123, and 124, the State Water Resources Control Board (SWRCB) adopted a general NPDES permit to regulate stormwater discharges associated with industrial activity. Stormwater discharges from petroleum refining operations are subject to requirements under this general permit unless a site-specific NPDES permit has been issued to the facility. Terminal operations are subject to NPDES stormwater requirements if vehicle or equipment maintenance is conducted onsite.

CWA requirements also include both spill prevention (Spill Prevention Control and Countermeasure) and spill response (Facility Response) plans for certain facilities.

On July 23, 1997, the SWRCB adopted a revised Water Quality Control Plan for Ocean Water of California (Ocean Plan). The Ocean Plan contains water quality objectives for coastal waters of California.

On May 18, 1972 (amended on September 18, 1975), the SWRCB adopted a Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan). The Thermal Plan contains temperature objectives for the Pacific Ocean.

On June 13, 1994, the Los Angeles Regional Water Quality Control Board (LARWQCB) adopted an updated Water Quality Control Plan for the Los Angeles Region (LA Basin Plan). The LA Basin Plan incorporates by reference the SWRCB's water quality control plans for ocean waters, control of temperature, significant SWRCB's policies that are applicable to the Los Angeles Region, and the antidegradation policy.

The LA Basin Plan contains water quality objectives for, and lists the following beneficial uses of, waterbodies in the vicinity of the Refinery:

- <u>Nearshore Zone</u> (Bounded by the shoreline and a line 1,000 feet from the shoreline or the 30-foot depth contour, whichever is farther from shore)

  Existing Beneficial Uses: Industrial service supply, navigation, water contact and non-water contact recreation, ocean commercial and sport fishing, preservation of areas of special biological significance, preservation of rare and endangered species, marine habitat, shellfish harvesting, and fish spawning.

- Offshore Zone (Beyond the Nearshore Zone)

  Existing Beneficial Uses: Industrial service supply, navigation, water-contact and non-water-contact recreation, ocean commercial and sport fishing, preservation of rare and endangered species, marine habitat, and shellfish harvesting.

- Dockweiler Beaches (Hydrologic Unit 405.12, specifically defined unit separate from the Nearshore Zone):

  Existing Beneficial Uses: Industrial service supply, navigation, water contact recreation, non-contact water recreation, commercial and sport fishing, marine habitat, and wild habitat.

  Potential Beneficial Uses: Spawning, reproduction, and/or early development of marine fishes.

Discharges from the Refinery must comply with the following objectives for these waterbodies:

Physical Characteristics

- Floating particulates and grease and oil shall not be visible.
- The discharge of waste shall not cause aesthetically undesirable discoloration of the ocean surface.
- Natural light shall not be significantly reduced at any point outside the initial dilution zone as the result of the discharge of waste.
- The rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded.

Chemical Characteristics

- The dissolved oxygen concentration shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen-demanding waste materials.
- The pH shall not be changed at any time more than 0.2 units from that which occurs naturally.
- The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions.
- The concentration of substances set forth in Chapter IV, Table B, in marine sediments shall not be increased to levels which would degrade indigenous biota.
- The concentration of organic materials in marine sediments shall not be increased to levels which would degrade marine life.
- Nutrient materials shall not cause objectionable aquatic growths or degrade indigenous biota.

Biological Characteristics

- Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded.
- The natural taste, odor, and color of fish, shellfish, or other marine resources used for human consumption shall not be altered.
- The concentration of organic materials in fish, shellfish, or other marine resources used for human consumption shall not bioaccumulate to levels that are harmful to human health.

Radioactivity

- Discharge of radioactive waste shall not degrade marine life.

On March 11, 1994, the Santa Ana RWQCB adopted an updated Water Quality Control Plan for the Santa Ana River Basin (Santa Ana Basin Plan) and the plan was approved by the U.S. EPA. The regional boundaries for the Santa Ana Region are the Los Angeles County line, the crest of the San Gabriel and San Bernardino Mountains, the Santa Margarita River, and the Pacific Ocean. Designated beneficial uses for the Santa Ana River in the vicinity of the Huntington Beach Terminal include both contact and non-contact recreation. Numeric water quality objectives have not been developed for the lower Santa Ana River. General qualitative water quality objectives for inland surface waters include:

Physical Characteristics

- Inland surface waters shall not contain taste- or odor-producing substances at concentrations which cause a nuisance or adversely affect beneficial uses.
- The natural receiving water temperature shall not be altered.
- Waste discharges shall not contain floating materials, including solids, liquids, foam, or scum, which cause a nuisance or adversely affect beneficial uses.
- Inland surface waters shall not contain suspended or settleable solids in amounts which cause a nuisance or adversely affect beneficial uses.
- Waste discharges shall not result in coloration of receiving waters which causes a nuisance or adversely affect beneficial uses.
- Inland surface waters shall be free of changes in turbidity which adversely affect beneficial uses.

Chemical Characteristics

- Boron concentrations shall not exceed 0.75 milligrams per liter (mg/L) in inland surface waters as a result of controllable water quality factors.
- The pH shall not be raised above 8.5 or depressed below 6.5 as a result of controllable water quality factors.
- The toxicity of cadmium, copper, and lead varies with water hardness. Water quality

objectives that would apply to a water sample with 200 mg/L total hardness are: 1.7 mg/L of cadmium, 18.2 mg/L of copper, and 4.1 mg/L of lead.

- Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations which result in a visible film or which cause a nuisance or adversely affect beneficial uses.
- The dissolved sulfide content of inland surface waters shall not be increased as a result of controllable water quality factors.

Radioactivity

- Radioactive materials shall not be present in concentrations which are deleterious to human, plant, or animal life.

Refinery

The Refinery is located adjacent to the Santa Monica Bay (Bay) on the Pacific Ocean. The Bay is recognized by the U.S. EPA and the State as a natural resource of national significance and is preserved and protected under the National Estuary Program.

The Santa Monica Bay Restoration Project (SMBRP) is a coalition of environmentalists, government, scientists, business, and the public that was formed in 1988 to develop a restoration plan for the Bay. It was one of the first National Estuary Programs nationwide. The SMBRP is funded by the U.S. EPA, the State of California, and the Santa Monica Bay Restoration Foundation. The project was approved by Governor Wilson in 1994, and by U.S. EPA Administrator Browner in 1995. The pollutants of concern identified by the SMBRP for the El Segundo subwatershed include heavy metals (cadmium, chromium, copper, lead, nickel, silver, zinc), debris, pathogens, oil and grease, chlordane, and polycyclic aromatic hydrocarbons (PAHs). In addition, the SMBRP implements the Mass Emission Approach. The objective is to reduce mass emissions of pollutants that have detectable inputs into the Bay and can accumulate in the marine environment. Copper, lead, silver, and zinc have interim mass emission performance caps. These caps are reflected in Chevron's NPDES permit discharge limits.

In addition to the pollutants identified by the SMBRP, the 1998 CWA Section 303(d) California List, approved by the U.S. EPA on May 12, 1999, identified the following as pollutants of concern for the Bay (Offshore and Nearshore): dichloro-diphenyl trichloroethane (DDT), polychlorinated biphenyls (PCBs), PAHs, chlordane, heavy metals (cadmium, copper, lead, mercury, nickel, silver, zinc), and debris.

Under NPDES Permit No. CA0000337, which expires in July 2002, the Refinery is authorized to discharge up to 8.8 million gallons of treated wastewater during dry weather and up to 23 million gallons per day during wet weather to the Bay (Pacific Ocean), near Dockweiler State Beach in El Segundo. The wastewater is discharged through Refinery Outfall 001, which is located approximately 3,500 feet offshore.

The requirements of the permit specifically address effluent discharges to the Bay, receiving water quality, and monitoring/reporting. Effluent limitations are identified in Tables 3.6-1, 3.6-2, and 3.6-3. Effluent monitoring reports are submitted monthly to the LARWQCB.

Wastewater is collected and treated in two separate drain and treatment systems, a segregated system and an unsegregated system. The unsegregated system, which consists of an API separator and induced air flotation (IAF) units, is normally used for non-process wastewater, including cooling tower blowdown, steam condensate, a portion of the water pumped from groundwater recovery wells, and other wastewater streams containing free oil recovered with primary (physical) treatment only. Primary treatment consists of the separation of oil, water, and solids in two stages. During the first stage (API separator), wastewater moves very slowly through the separator allowing free oil to float to the surface and be skimmed off, and solids to settle to the bottom. Periodically, the separator is shut down and the sludge is collected for disposal. The second stage utilizes an IAF unit, which bubbles air through the wastewater, and both oil and suspended solids are skimmed off the top. The unsegregated system is also used to collect and treat stormwater. Both structural (impoundments, berms, and curbs) and non-structural (inspections and training) controls are used to keep contaminants from entering the unsegregated system.

Table 3.6-1
Effluent Limitations and Performance Goals
Constituents with Instantaneous and Daily Limitations

Constituents	Units	Discharge Limitations[1]		Performance Goals[1,5]	
		Monthly (30-day average)	Daily[3]* Maximum	Instantaneous[9] Maximum	Monthly (30-day average)
Conventional and Nonconventional Pollutants					
$BOD_5 20^oC$[4]	lbs/day mg/l	1,976[2] 30	3,952 60	NA	——[6a]
Suspended solids	lbs/day mg/l	1,976[2] 30	3,952 60	NA	——[6a]
Chemical oxygen demand (COD)	lbs/day mg/l	17,597[8] 264	35,194 528	NA	11,300 169[6]
Oil and grease	lbs/day mg/l	733[8] 12	1,466 24	NA	——[6a]
Phenolic compounds	lbs/day µg/l	13[8] 195	26 390	NA	——[6a]
Ammonia (as N)	lbs/day mg/l	1,375[8] 21	2,750 42	NA	870 13[6]
Sulfide	lbs/day µg/l	13[8] 195	26 390	NA	5 75[6]
Total chromium	lbs/day µg/l	15[8] 225	30 450	NA	——[7] ——

Table 3.6-1 (continued)
Effluent Limitations and Performance Goals
Constituents with Instantaneous and Daily Limitations

Constituents	Units	Discharge Limitations[1]		Performance Goals[1,5]	
		Monthly (30-day average)	Daily[3]* Maximum	Instantaneous[9] Maximum	Monthly (30-day average)
Hexavalent chromium	lbs/day µg/l	1.2[8] 19	2.4 38	NA	____[7] ____
Toxic Constituents – Marine Aquatic Life					
Arsenic	µg/l kg/day lbs/day	198[10] 6 13.21	1,134 34.4 75.7	3,006 91.4 201	39[6b] 1.2 3
Copper	µg/l kg/day lbs/day	41[10] 1.24 2.74	392 12 26.2	1,094 33.2 73	____[7] ____ ____
Cadmium	µg/l kg/day lbs/day	39[10] 1.18 2.6	156 4.72 10.4	390 11.8 26	____[7] ____ ____
Lead	µg/l kg/day lbs/day	78[10] 2.37 5.2	312 9.48 20.8	780 23.4 52	____[7] ____ ____
Mercury	µg/l kg/day lbs/day	1.5[10] 0.05 0.10	6.2 0.19 0.42	15.6 0.47 1.04	____[7] ____ ____
Nickel	µg/l kg/day lbs/day	195[10] 5.91 13.01	780 23.64 52.04	1,950 59.1 130.1	27[6] 819 2
Selenium	µg/l kg/day lbs/day	____[11] ____ ____	____ ____ ____	____ ____ ____	157[6] 4.8 11
Silver	µg/l kg/day lbs/day	21[10] 0.64 1.4	103 3.2 7	267 8.1 17.8	____[7] ____ ____
Zinc	µg/l kg/day lbs/day	476[10] 14.44 31.76	2,816 86 188	7,496 227 500	____[7] ____ ____
Cyanide	µg/l kg/day lbs/day	39[10] 1.18 2.6	156 4.72 10.4	390 11.8 26	____[7] ____ ____

Table 3.6-1 (continued)
Effluent Limitations and Performance Goals
Constituents with Instantaneous and Daily Limitations

Constituents	Units	Discharge Limitations[1]		Performance Goals[1,5]	
		Monthly (30-day average)	Daily[3]* Maximum	Instantaneous[9] Maximum	Monthly (30-day average)
Total residual chlorine	µg/l kg/day lbs/day	78[10] 2.37 5.2	312 9.48 20.8	2,340 71 156	____[7] ____ ____
Chlorinated phenolics[12]	µg/l kg/day lbs/day	39[10] 1.18 2.6	156 4.72 10.4	390 11.8 26	____[7] ____ ____
Endosulfan	ng/l gm/day lbs/day	351[10] 10.45 0.023	702 20.9 0.046	1,053 31.35 0.069	____[7] ____ ____
Toxicity chronic[13]	TU_c	____	39	____	____
Endrin	ng/l gm/day lbs/day	78[10] 2.36 0.005	156 4.72 0.011	234 7.08 0.016	____[7] ____ ____
HCH[14]	ng/l gm/day lbs/day	156[10] 4.73 0.011	312 9.45 0.021	468 14.18 0.032	____[7] ____ ____

1 The mass emission calculations are/or shall be based on the average flow of 8 million gallons per day (mgd).
2 Based on previous permit limit (full secondary requirements of the Clean Water Act).
3 The daily maximum effluent concentrations limit shall apply to flow-weighted 24-hour composite samples.
4 Analysis using Standard Method 5210 shall be reported as $CBOD_5$. When the nitrification inhibitor is not used, the monitoring report shall so state and the results shall be reported as BOD_5.
5 The performance goals are based upon the actual performance of the discharge facility and are specified only as an indication of the treatment efficiency of the facility. They are not considered as limitations or standards for the regulation of the treatment facility. Chevron shall make best efforts to maintain the effluent quality performance goals. The Executive Officer may modify any of the performance goals if Chevron requests and has demonstrated that the change is warranted.
6 Numerical effluent quality performance goals were derived statistically using effluent performance data for the period from May 1992 through October 1996. Effluent values (X) are assumed to be lognormally distributed. The use of logarthmic transformation equation, Y=Ln (X), results in effluent values (Y) that are normally distributed. Effluent quality performance goals are determined by the equation:

$$X_{.95} = \exp\left[U_n + (Z_{.95})(\sigma_n)\right]$$

where $X_{.95}$ = discharge effluent quality performance goal at the 95th percentile of the normal distribution.
U_n = mean of the distribution of the average of n values transformed.
$Z_{.95}$ = z-value from the Table of Areas under the Standard Normal Curve: equal to 1.645 at 95%.
σ_n = standard deviation of the distribution of the average of n values transformed.
Exp is exponential to the base "e" value = 2.7183.

Table 3.6-1 (concluded)
Effluent Limitations and Performance Goals
Constituents with Instantaneous and Daily Limitations

Constituents	Units	Discharge Limitations[1]		Performance Goals[1,5]	
		Monthly (30-day average)	Daily[3]* Maximum	Instantaneous[9] Maximum	Monthly (30-day average)

6a. No performance goals are prescribed when performance data are less than one order-of-magnitude lower than the limit.
6b. Based on the previous permit.
7. No performance goals are prescribed for pollutants which monitoring data have consistently showed nondetectable levels, or which have been occasionally detected at levels less than the Practical Quantitation Levels (PQL), and have been determined not to have reasonable potential to cause or contribute to exceedance of water quality objectives. However, these pollutants shall be monitored at an appropriate frequency.
8. Based on the previous permit limit (40 CFR Part 419 Subpart b) and 8 million gallons per day.
9. The instantaneous maximum shall apply to grab samples determinations.
10. Based on Ocean Plan limits using a minimum dilution factor of 38.
11. The prescribed performance goal is orders-of-magnitude lower than the calculated limit based on the Ocean Plan objectives and have been determined not to have reasonable potential to cause or contribute to exceedance of water quality objectives. Therefore, no numerical limit was prescribed; instead a narrative limit to comply with all Ocean Plan objectives is provided.
12. Sum of 2-chlorophenol, 4-chloro-3-methylphenol, 2,4-dichlorophenol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, and pentachlorophenol.
13. Sum of heptachlor and heptachlor epoxide.
14. HCH means the sum of the alpha, beta, gamma (lindane), and delta isomers of hexachlorocyclohexane.
* The monthly (30-day average) discharge limitations listed in Table 3.6-2 may be added to the constituents within this table.

Table reference from CARB, Los Angeles Region, NPDES No. CA0000337 Waste Discharge Requirements for Chevron El Segundo Refinery, California

mg/l = milligram per liter; kg/day = kilogram per day; ng/l = nanogram per day; µg/l = microgram per liter; and TU_C= toxicity unit of chronic

Table 3.6-2
Effluent Limitations and Performance Goals*

Constituents	Units	Discharge Limitations	
		Monthly (30-day average)	Daily[1] Maximum
Incremental Limits for Discharges with Ballast Water			
BOD_5	Lbs/1,000 gpd of ballast water flow	0.21	0.40
TSS	Lbs/1,000 gpd of ballast water flow	0.17	0.26
COD	Lbs/1,000 gpd of ballast water flow	2.0	3.9
Oil and grease	Lbs/1,000 gpd of ballast water flow	0.067	0.126

Table 3.6-2 (concluded)
Effluent Limitations and Performance Goals*

Constituents	Units	Discharge Limitations	
		Monthly (30-day average)	Daily[1] Maximum
Incremental Limits During Wet Weather Discharges			
$BOD_5$20ºC	Lbs/1,000 gpd of contaminated rainfall runoff	0.22	0.40
Suspended solids	Lbs/1,000 gpd of contaminated rainfall runoff	0.18	0.28
COD	Lbs/1,000 gpd of contaminated rainfall runoff	1.5	3.0
Oil and grease	Lbs/1,000 gpd of contaminated rainfall runoff	0.067	0.13
Phenolic compounds	Lbs/1,000 gpd of contaminated rainfall runoff	0.0014	0.0029
Total chromium	Lbs/1,000 gpd of contaminated rainfall runoff	0.0018	0.0050
Hexavalent chromium	Lbs/1,000 gpd of contaminated rainfall runoff	0.00023	0.00052
Incremental Limits for Additional Groundwater Discharges			
BOD_5	Lbs/1,000 gpd of groundwater	0.17	0.34
Total suspended solids	Lbs/1,000 gpd of groundwater	0.12	0.24
Oil and grease	Lbs/1,000 gpd of groundwater	0.013	0.026
COD	Lbs/1,000 gpd of groundwater	0.85	1.7
Ammonia as N	Lbs/1,000 gpd of groundwater	0.10	0.20

1. The daily, maximum effluent concentration limit shall apply to flow-weighted 24-hour composite samples.
* May be added to those constituents listed in Table 3.6-1.
gpd gallons per day.
Table reference from CARB, Los Angeles Region, NPDES No. CA0000337 Waste Discharge Requirements for Chevron El Segundo Refinery, California

Table 3.6-3
Effluent Limitations and Performance Goals
Constituents with Monthly Limitations

Constituents	Units	Discharge Limitations	Performance Goals[1,5]
		Monthly (30-day average)	Monthly (30-day average)
Toxic Constituents – Marine Aquatic Life – Noncarcinogens			
Bis(2-chloroethoxy)methane	µg/l	172[10]	____[7]
2,4-Dinitrophenol	µg/l	156[10]	____[7]
Nitrobenzene	µg/l	191[10]	____[7]
Tributyltin	ng/l	55[10,11,12]	____
Toxic Constituents – Marine Aquatic Life –Carcinogens			
Acrylonitrile	µg/l	3.9[10]	____[7]
Aldrin	ng/l	0.86[10,11]	____[7]
Benzene	µg/l	230[10]	____[7]
Beryllium	ng/l	1,287[10,11]	____[7]
Bis(2-chloroethyl) ether	µg/l	1.8[10]	____[7]
Bis(2-ethylhexyl) phthalate	µg/l	136[10]	____[7]
Benzidine	ng/l	2.7[10,11]	____[7]
Carbon tetrachloride	µg/l	35[10]	____[7]
Chlordane[13]	ng/l	0.90[10,11]	____[7]
DDT[14]	ng/l	6.6[10,11]	____[7]
1,4-Dichlorobenzene	µg/l	702[10]	____[7]
3,3-Dichlorobenzidine	ng/l	316[10,11]	____[7]
1,3-Dichloropropene	µg/l	347[10]	____[7]
Dieldrin	ng/l	1.6[10,11]	____[7]
2,4-Dinitrotoluene	µg/l	101[10]	____[7]
1,2-Diphenylhydrazine	µg/l	6.2[10]	____[7]
Heptachlor[15]	ng/l	28[10,11]	____[7]
Hexachlorobenzene	ng/l	8.2[10,11]	____[7]
Hexachlorobutadiene	µg/l	546[10]	____[7]
Hexachloroethane	µg/l	98[10]	____[7]
N-nitrosodimethylamine	µg/l	285[10]	____[7]
N-nitrosoldiphenylamine	µg/l	97[10]	____[7]
PAHs[16]	ng/l	343[10,11]	____[7]
PCBs[17]	ng/l	0.74[10,11]	____[7]
TCDD equivalents[18]	pg/l	0.15[10,11]	____[7]
Toxaphene	ng/l	8.2[10,11]	____[7]
2,4,6-Trichlorophenol	µg/l	11[10]	____[7]

Table 3.6-3 (concluded)
Effluent Limitations and Performance Goals
Constituents with Monthly Limitations

Constituents	Units	Discharge Limitations	Performance Goals[1,5]
		Monthly (30-day average)	Monthly (30-day average)

Notes 1 through 10 are referenced in Table 3.6-1.

11. These constituents have calculated numerical limits (based on the Ocean Plan) which are below the Method Detection Limits (MDL). Compliance shall be determined based on PQL. Published values for MDLs and PQLs shall be used except where MDLs and PQLs based on laboratory performance evaluations are available and were approved by the Executive Officer, in which the latter shall be used. If performance PQLs are not available, then the PQL shall be determined by multiplying the published MDL with the Ocean Plan factors of five for carcinogens and 10 for noncarcinogens. All analytical data shall be reported uncensored with detection limits and PQLs identified.
12. Chevron has been reporting tributyltin as total tin, thus, compliance with the limit cannot be ascertained and the detection limit is relatively high compared to the limit. Chevron shall therefore investigate lower MDL and report tributyltin as tributyltin. If necessary to comply with the requirements, conduct a study to identify the source(s) of this pollutant, implement all reasonable measures to reduce this pollutant in the effluent. The work plan and schedule for the study(ies) shall be approved by the Executive Officer and shall be submitted in writing within 30 days of the effective date of this Order.
13. Sum of chlordane-alpha, chlordane-gamma, chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlorgamma, and oxychlordane.
14. Sum of 4,4'-DDT, 2,4'-DDT, 4,4'-DDT, 2,4'-DDE, 2,4'-DDD, and 2,4'-DDD.
15. Sum of heptachlor and heptachlor epoxide.
16. Sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo(k)fluoranthene, 1,12-benzoeprylene, benzo(a)pyrene, chrysene, dibenzo(ah)anthracene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene.
17. Sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260.
18. Sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7.,8-CDFs) multiplied by their respective toxicity factors, as shown in below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8-tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
octa CDF	0.001

Table reference from CARB, Los Angeles Region, NPDES No. CA0000337 Waste Discharge Requirements for Chevron El Segundo Refinery, California

The segregated system is normally used to treat process wastewater containing emulsified oil, organic chemicals, and a portion of the water pumped from groundwater recovery wells. This system consists of gravity separators, a dissolved air flotation (DAF) unit, and activated sludge units for secondary (biological) treatment. In secondary treatment, dissolved oil and other organic pollutants may be consumed biologically by microorganisms. Effluent that does not meet the discharge limits may receive additional solids removal from an auxiliary off-specification DAF unit, or be routed to two auxiliary effluent diversion tanks for additional IAF treatment. The biosolids from the biological treatment is disposed to the sanitary sewer for treatment by the Hyperion Treatment Plant under an Industrial Waste Discharge Permit.

The two auxiliary effluent diversion tanks are available for handling wastewater from either of the two systems and excess stormwater runoff. During severe rainstorms, excess runoff is collected and pumped into the diversion tanks, which have a holding capacity of 13,770,540 gallons. From the tanks, the water can be routed to either system for treatment prior to discharge.

California Senate Bill 1196 allows dischargers to adjust their discharge requirements to reflect the additional contaminants in reclaimed water not normally present in potable water. The Refinery's NPDES permit implements this allowance and provides the method of calculating the credit associated with the use of reclaimed water. However, Chevron has not requested any credit under Senate Bill 1196 since 1995.

The ground surface generally slopes from east to west in the site vicinity. Surface water flows into impound basins located throughout the Refinery. Each of the impound basins can only be emptied by manual activation of pumps, ejectors, or vacuum trucks. None of the impound basins is connected to the Refinery drainage system; however, rainfall runoff from these areas may be pumped to the wastewater system.

Because Chevron contains or treats all of its stormwater flows, the only applicable requirement from the California General Stormwater Permit (General Permit) is to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). The Refinery has complied with this requirement. Additionally, a Spill Prevention Control and Countermeasure (SPCC) Plan and an approved Emergency Response Plan have been prepared for the Refinery.

Montebello Terminal

The Montebello Terminal is located in a predominantly commercial and light industrial area. Several ASTs are located onsite, with a total capacity of approximately 200,000 bbls. Tanks are gauged regularly and the product levels are continuously monitored. Drain valves and tank water draw-off valves are closed and locked when not in use. All tanks are located within secondary containment.

Stormwater that accumulates in the diked tank farm flows to the southwest corner of the tank farm, where there is a catch basin. A drain line equipped with a dike drain valve connects to a vault outside the tank farm. Stormwater is inspected, the drain valve is opened, and discharge drains to the vault if no sheen is present. If hydrocarbons are present, the water is pumped into vacuum trucks and hauled offsite for disposal. The vault drains to the storm system in Flotilla Street.

Surface runoff from yard areas generally flows toward the southeast. Drainage at the loading rack drains to the underground wastewater tank.

The facility is covered by the General Permit for stormwater discharges and a SWPPP has been prepared for the facility. A SPCC Plan has also been prepared for the facility that describes spill prevention measures, which include loading/unloading procedures, inspections, and training requirements.

Effluent from the truck wash rack is discharged to the municipal sewer under Industrial Wastewater Discharge Permit No. 4840, which was issued by the Los Angeles County Sanitation District (LACSD).

A 20,000-gallon double-walled underground storage tank (UST) collects wastewater generated onsite. The contents are pumped out by vacuum truck and transported offsite to a recycler or treatment facility.

Van Nuys Terminal

The Van Nuys Terminal is located in a predominantly commercial and light industrial area. Several ASTs are located onsite, with a total capacity of approximately 76,150 bbls. Tanks are automatically gauged and the product levels are continuously monitored. The onsite ASTs are equipped with a level detection and warning system. Drain valves and tank water draw-off valves are closed and locked when not in use. All tanks are located within secondary containment. There are four hydrocarbon sensors located throughout the facility that are attached to an emergency shutdown system.

Stormwater discharges from the terminal are regulated by NPDES Permit No. 96-018, which expired on March 10, 2001. A permit application was submitted on December 27, 2000 for a new permit; however, the facility has not yet received a new permit. Until the new permit is received, stormwater discharges from the terminal continue to be regulated by permit No. 96-018. Up to 50,000 gallons of stormwater per day are intermittently discharged via a storm drain to Outfall 001, which is located in Sepulveda Boulevard and Oxnard Street and Outfall 002, which is located in Oxnard Street. Stormwater that collects in the tank farm passes through an oil/water separator and sedimentation unit prior to discharge to Outfall 001. Stormwater from the parking lot is discharged through Outfall 002. Effluent limits for the discharge include limitations on the concentrations of oil and grease, BOD, suspended solids, settleable solids, and phenols. Monitoring reports are provided to the RWQCB on a regular basis.

A SWPPP has been prepared for the facility. A SPCC Plan has also been prepared for the facility that describes spill prevention measures, which include loading/unloading procedures, inspections, and training requirements.

Effluent from the truck wash rack is discharged to the municipal sewer under Industrial Wastewater Permit No. W-249548, which was issued by the City of Los Angeles Department of Public Works.

Huntington Beach Terminal

The Huntington Beach Terminal is located in the Santa Ana River Basin and is surrounded to the north, west, and south by Huntington Central Park, a large regional park encompassing several hundred acres of open space and a lake. Several ASTs are located at the terminal, with a total capacity of approximately 86,500 bbls. Each tank is equipped with a level detection and warning system. Drain valves and tank water draw-off valves are closed and locked when not in use. All tanks are located within secondary containment.

Stormwater that collects in the diked areas flows to catch basins, which lead to a storm drain adjacent to Talbert Lake.

Sheet flow from paved areas flow either southwest toward a concrete berm or north toward a bermed catch basin. The valve at the concrete berm is maintained in a closed position and drains to an adjacent gravel field when opened. The valve at the bermed catch basin is locked in the closed position and drains to Talbert Lake when opened.

Sheet flow from the loading rack area drains to the off-spec product tank. This water is shipped to the Refinery for reprocessing.

The facility is covered by the General Permit for stormwater discharges and a SWPPP has been prepared for the facility. A SPCC Plan has also been prepared for the facility that describes spill prevention measures, which include loading/unloading procedures, inspections, and training requirements.

3.6.2.2 Groundwater Quality

Refinery and Montebello Terminal

The Refinery and the Montebello Terminal are located in the Los Angeles Basin, which is bordered by the Newport-Inglewood Fault on the east, by the Santa Monica Bay on the west, by the Ballona Gap on the north, and by the Palos Verdes Hills on the south. Many of the shallow water-bearing units in the Los Angeles Basin area are hydraulically connected to offshore sediments. Withdrawal of fresh water from these zones has resulted in significant seawater intrusion into the groundwater basins. The West Coast Basin Barrier Project is an ongoing project operated by the Los Angeles County Department of Public Works (LACDPW), which involves a series of injection and monitoring wells installed and maintained by the LACDPW to prevent seawater intrusion.

Groundwater resources are managed by the Water Replenishment District of Southern California, formerly known as the Central and West Basin Water Replenishment District. The State

Department of Water Resources acts as the court-appointed Watermaster in connection with water rights adjudications. In addition to limiting total extractions from the Basin, groundwater resources management programs administered by the Water Replenishment District include:

- Purchase of imported and reclaimed water for replenishment.
- Creation of fresh water barriers along the coast by injection of purchased imported water into injection wells. (This allows water levels in the more inland portions of the Basin to be drawn below sea level without the threat of seawater intrusion.)
- Monitoring of groundwater quality and determination of the relative quantities of local, imported, and reclaimed water to be used for replenishment to maintain the chemical quality of the groundwater.

Several measures have been taken to stabilize groundwater levels in the project vicinity and thereby combat the further intrusion of seawater (e.g., groundwater extractions are limited to adjudicated amounts under court control).

The groundwater below the Refinery has been impacted by past site operations. In May 1988, the LARWQCB issued cleanup and abatement orders for the extraction and treatment of hydrocarbon-contaminated groundwater from the Old Dune Sand Aquifer underneath the Refinery. In August 1995, the order was revised requiring Chevron to increase the rate of groundwater extraction to enhance free product removal in order to prevent further vertical migration of petroleum hydrocarbons into deeper aquifers.

Van Nuys Terminal

The Van Nuys Terminal is located in the San Fernando Valley. The groundwater quality of the San Fernando Valley Groundwater Basin been impacted by VOCs from industry and nitrates from subsurface sewage disposal and past agricultural activities. The basin does not have continuous effective confining layers above groundwater, and as a result, pollutants have seeped through the upper sediments into the groundwater.

Huntington Beach Terminal

The Huntington Beach Terminal is located in the Santa Ana Region, which is characterized as a group of connected inland groundwater basins and open coastal basins drained by surface streams flowing generally southwest toward the Pacific Ocean. Contaminated groundwater underlies many areas of the region, resulting from historic discharges of chlorinated solvents.

MTBE

The nationwide use of MTBE in gasoline dates back to 1979. As an oxygenate and an octane-enhancing additive, MTBE offered more efficient and cleaner fuel combustion than lead, thereby reducing the lead concentrations in the atmosphere.

In recent years, however, MTBE has been detected in groundwater and surface water. This is a matter of great concern in California because of the potential threat to local water resources. To address this issue, Senate Bill 521 (SB 521) directed the University of California to study the human and environmental health impacts of MTBE. These studies show environmental risks associated with the use of MTBE as an oxygenate in gasoline. In addition to its disagreeable taste and odor, this chemical compound is very water-soluble and persistent in the environment.

Because of its high solubility, MTBE readily affects California's water reservoirs and infiltrates subsurface aquifers at a rapid rate. Groundwater and surface water contamination may result from point sources such as USTs and surface pipelines. As a result, through Executive Order D-5-99, Governor Gray Davis banned the use of MTBE in reformulated gasoline on March 25, 1999.

3.7 Land Use and Planning

This section provides a discussion of existing land uses in the vicinity of each of the affected project sites.

3.7.1 Regional Setting

With the exception of the Huntington Beach Terminal (located in Orange County), the Refinery and terminals are located in Los Angeles County. The areas of Los Angeles County where the facilities are located are generally urbanized and include a substantial amount of industrial and port-related development, due to the proximity of the Ports of Los Angeles and Long Beach. The Refinery is located in the City of El Segundo. The Montebello Terminal is located within the City of Montebello, and the Van Nuys Terminal is located within the City of Los Angeles. The Huntington Beach Terminal is located within the City of Huntington Beach in Orange County.

Los Angeles County is one of the nation's largest counties, encompassing 4,083 square miles. It is bordered on the east by Orange and San Bernardino counties, on the north by Kern County, on the west by Ventura County, and on the south by the Pacific Ocean. It has the largest population (9.8 million as of July 1999) of any county in the nation. Approximately 29 percent of California's residents live in Los Angeles County (County of Los Angeles, 2000).

Orange County is comprised of approximately 800 square miles, including 42 miles of coastline, and is situated between Los Angeles and San Diego Counties (County of Orange, 2000). Orange

County is the third most populous county in California and one of the most densely populated areas in the United States. Between 1950 and 1990, the population has increased tenfold. The growth is expected to continue, with the population projected to rise from 2.8 million to approximately 3.3 million people by 2020 (County of Orange, 2000).

The areas surrounding the project sites can generally be characterized as a blend of heavy and light industrial, commercial, medium- and high-density residential, and industrial/manufacturing.

3.7.2 Project Site and Vicinity Land Uses

Refinery

The proposed modifications to the Refinery will be developed within existing Refinery property boundaries. Land use on the Refinery grounds is dominated by heavy industry and manufacturing.

Land to the north of the Refinery on the north side of El Segundo Boulevard is primarily industrial and commercial. Residential development is located farther north of the industrial and commercial uses fronting El Segundo Boulevard. Land to the northeast of the Refinery is designated for mixed-use commercial purposes.

Land uses east of the Refinery on the east side of Sepulveda Boulevard include primarily light and heavy industrial, with some areas designated for open space and public facilities.

South of the Refinery is Rosecrans Avenue, beyond which are single-family residences located within the City of Manhattan Beach. Land uses southeast of the Refinery within the Manhattan Beach city limits include mixed-use commercial development such as hotels, shopping centers, and office buildings.

West of the Refinery is Vista Del Mar Boulevard, beyond which is Dockweiler State Beach and the Pacific Ocean. Other coastal development in the vicinity of the Refinery includes City of Los Angeles facilities such as the Hyperion Sewage Treatment Plant and the Los Angeles Department of Water and Power's Scattergood Generating Station, as well as the El Segundo Power II LLC power plant.

Montebello Terminal

The Montebello Terminal is located inland from the coast in the San Gabriel Valley area of Los Angeles County. Land use in the immediate vicinity is dominated by heavy industry and manufacturing, with some residential development north of the terminal site.

Directly to the north of the terminal is a railroad right-of-way owned by the Los Angeles and Salt Lake Railroad Company. Beyond the railroad right-of-way is residential development within the Montebello city limits and within unincorporated Los Angeles County.

Adjacent to the east side of the terminal is Vail Avenue, beyond which are light industrial and commercial land uses. Farther east of the light industrial/commercial development (approximately ½-mile east of the terminal), land use is primarily residential.

To the south of the terminal is Flotilla Street, beyond which is a vacant lot. Farther south beyond the vacant lot, land uses include commercial and industrial development.

Adjacent to the west of the terminal is a Metrolink Rail Station and vacant land. Farther west is industrial development located within the Commerce city limits.

Van Nuys Terminal

The Van Nuys Terminal is located within the northern portion of the City of Los Angeles. Land uses in the immediate vicinity are primarily industrial, but also consist of open space/recreational uses.

To the north of the terminal is a large industrial warehouse building, beyond which is a branch of the Union Pacific Railroad. Farther north beyond the railroad tracks are parking areas and additional warehouse buildings.

Adjacent and to the east of the terminal is an office building, beyond which is Sepulveda Boulevard. Farther east on the other side of Sepulveda Boulevard are additional office and warehouse buildings.

To the south of the terminal is Oxnard Street, beyond which are various light industrial and commercial businesses. Businesses include a towing shop, a self-storage facility, a mechanics shop, and a lighting installation company.

Adjacent and to the west of the terminal is a parking area for the large industrial warehouse building adjacent to the north of the terminal. Beyond the parking area is the Sepulveda Dam Recreation Area.

Huntington Beach Terminal

The Huntington Beach Terminal is located in the City of Huntington Beach in a mixed-use area consisting of recreational, light industrial, and commercial land uses.

To the north, south, and west of the terminal is Huntington Central Park, a regional park encompassing several hundred acres of open space, equestrian trails, and camping facilities. A public library is located within the park, to the west of the terminal. Additional park acreage on the south side of Talbert Avenue is the proposed site of a sports complex.

Adjacent to the east of the terminal is Gothard Street, beyond which are light industrial and commercial facilities, including business parks, warehousing facilities, professional office buildings, and retail centers.

3.7.3 Zoning

The following is a summary of the zoning designations for the Refinery and the terminals.

Refinery

The Refinery is zoned by the City of El Segundo as Heavy Industrial (M-2). Zoning surrounding the Refinery (see Figure 3.7-1) varies from commercial to industrial.

To the north of the Refinery, zoning designations (from west to east) include Open Space (O-S) and Multi-Family Residential (R-3), Parking (P), Downtown Specific Plan (DSP), Medium Manufacturing (MM), and Corporate Office (CO). To the east of the Refinery, zoning designations include Open Space (O-S), Light Industrial (M-1), Public Facilities (P-F), and Heavy Industrial (M-2). A small portion along the east side of Sepulveda Boulevard, just south of El Segundo Boulevard, is designated Parking (P) and General Commercial (C-3). South of the Refinery, zoning designations (City of Manhattan Beach) include Medium Density Residential (RM), Single Family Residential (RS), and High Density Residential (RH). West of the Refinery is the Pacific Ocean.

Land use at the Refinery and in the surrounding vicinity is consistent with the City of El Segundo General Plan land use designations for the area. The Land Use element of the General Plan currently in force was adopted in December 1992. No revisions to the Land Use element have occurred since December 1992.

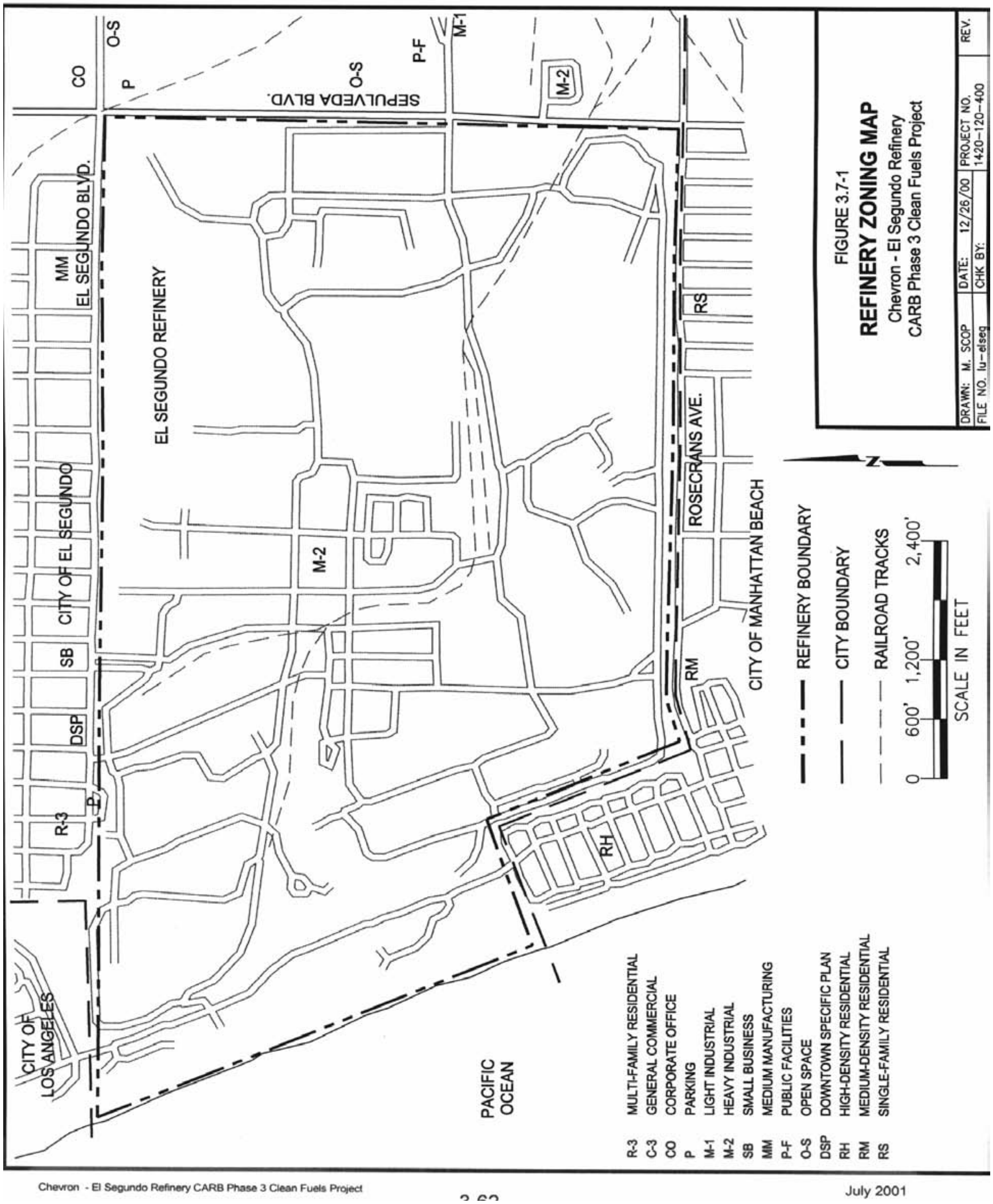


Figure 3.7-1 Zoning - Refinery

Montebello Terminal

The Montebello Terminal is zoned by the City of Montebello as Heavy Manufacturing (M-2). Zoning to the north of the terminal, across the railroad right-of-way, is Single-Family Residential (R-1). East of the terminal across Vail Avenue, zoning is Light Manufacturing (M-1). South and west of the site, zoning is Heavy Manufacturing (M-2).

Land use at the terminal site is a permitted use in the M-2 zone and is consistent with the City of Montebello General Plan. Figure 3.7-2 depicts zoning in the vicinity of the Montebello Terminal.

Van Nuys Terminal

The Van Nuys Terminal is zoned by the City of Los Angeles as Light Industrial (M2). The railroad right-of-way adjacent to the north is zoned Public Facilities (PF) and land north of the railroad right-of-way is zoned Limited Industrial (M1). Adjacent to the east, south, and west of the terminal, land is zoned Light Industrial (M2). To the west beyond the I-405 Freeway is the Sepulveda Dam Recreation Area and zoning is designated Public Facilities (PF). To the east across Sepulveda Boulevard, zoning is Light Industrial (M2) and Heavy Industrial (M3).

Land use at the Van Nuys Terminal site is a permitted use in the M2 zone and is consistent with the Van Nuys-Sherman Oaks Community Plan. Figure 3.7-3 depicts zoning in the vicinity of the Van Nuys Terminal.

Huntington Beach Terminal

The Huntington Beach Terminal is zoned by the City of Huntington Beach as General Industrial (IG). Zoning to the north and west is Open Space – Parks and Recreation (OS-PR). To the southwest and south beyond Talbert Avenue, zoning is Open Space – Parks and Recreation (OS-PR). Land south of the terminal at the southwestern corner of the intersection of Gothard Street and Talbert Avenue is zoned General Industrial (IG). Zoning to the east beyond Gothard Street is General Industrial (IG).

Land use at the terminal site is a conditionally permitted use in the IG zone and is consistent with the City of Huntington Beach General Plan. Figure 3.7-4 depicts the zoning in the vicinity of the Huntington Beach Terminal.

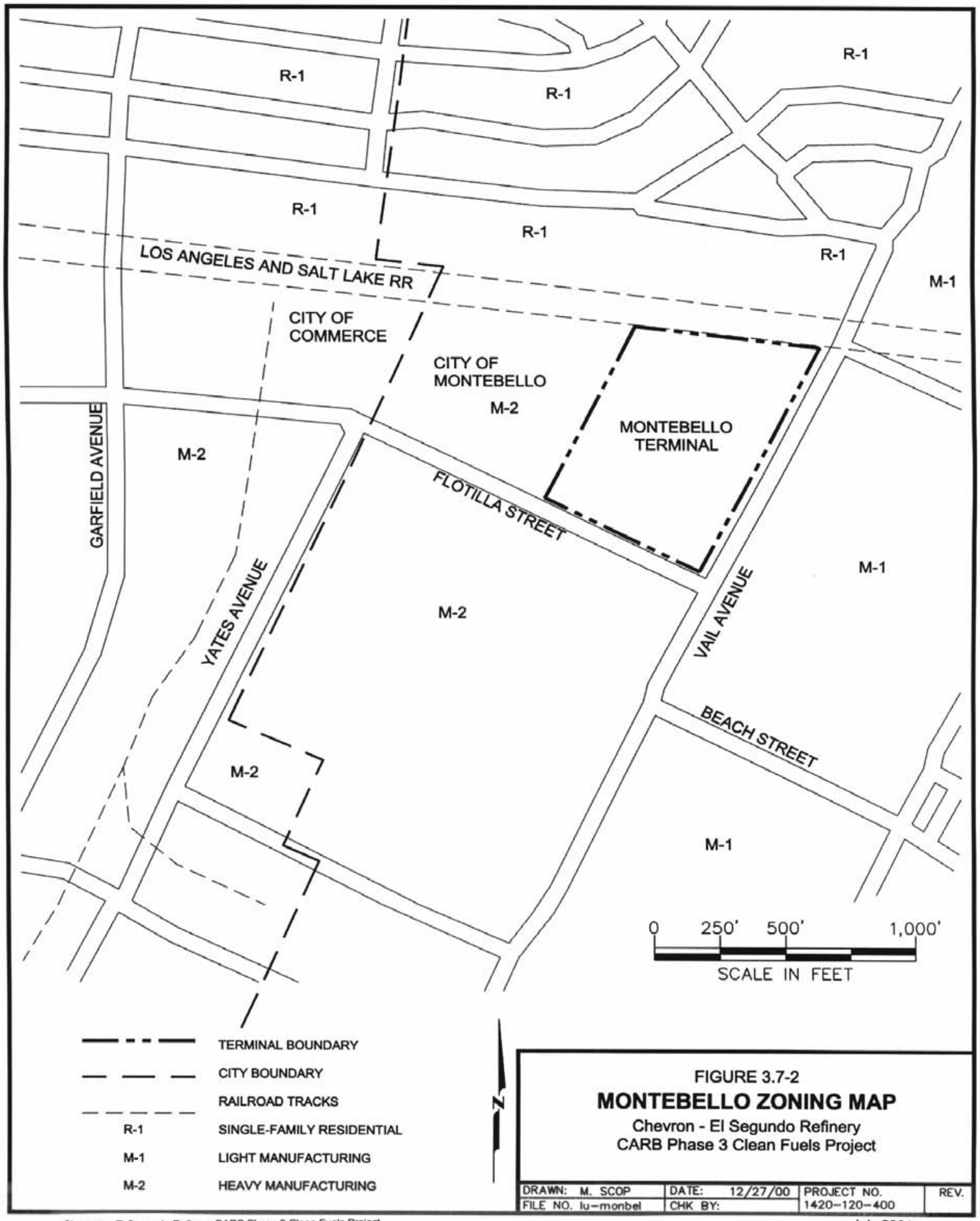


Figure 3.7-2 Zoning – Montebello Terminal

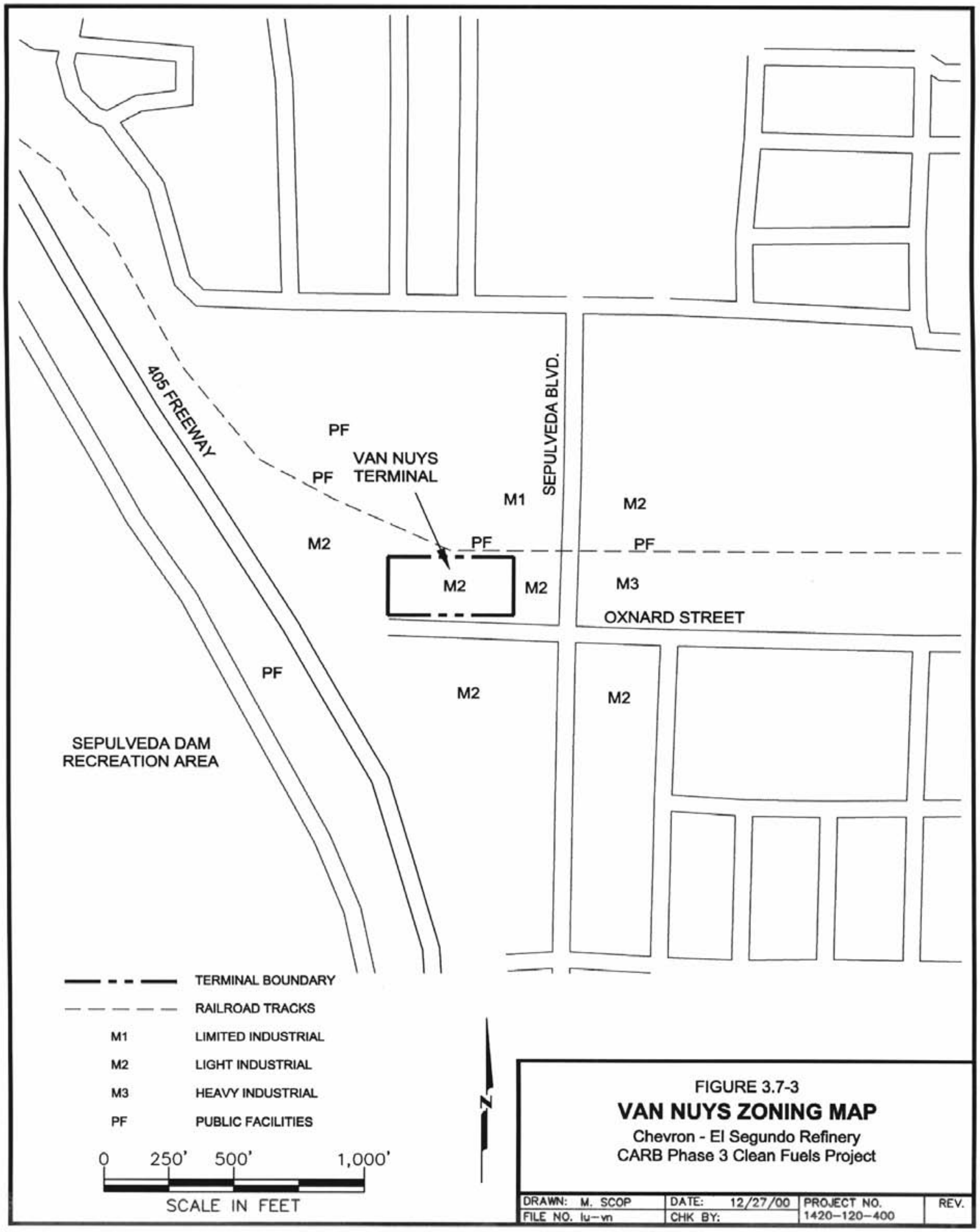


Figure 3.7-3 Zoning – Van Nuys Terminal

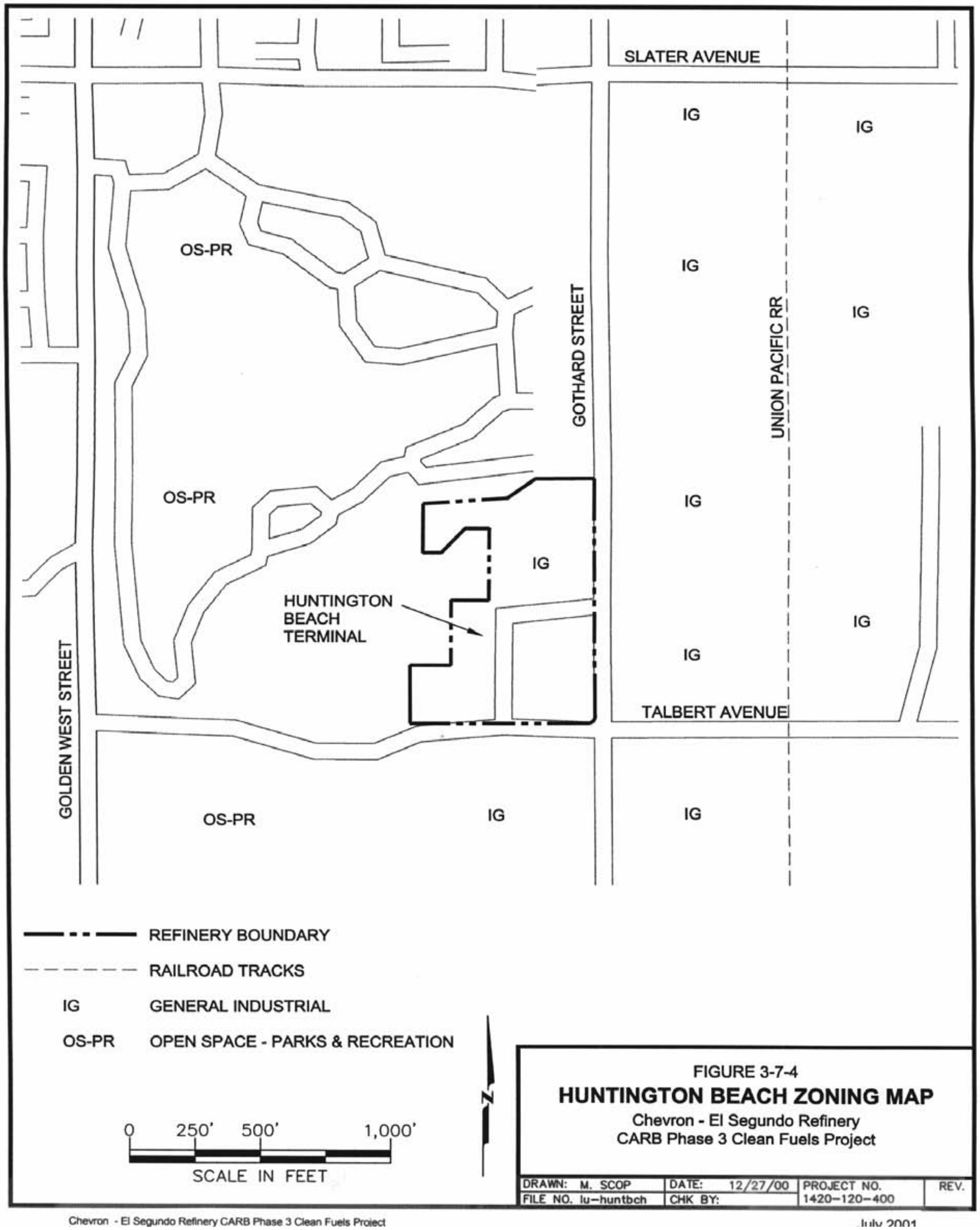


Figure 3.7-4 Zoning – Huntington Beach Terminal

3.7.4 Land Use Development Plans

The following information summarizes land use development plans in the areas of the Refinery and the terminals.

Refinery

According to the Land Use Element of the City of El Segundo General Plan (El Segundo, 1992), the City of El Segundo is almost entirely built out, with only 103 acres of vacant land within the city limits. Also indicated in the Land Use Element is the noticeable trend toward light manufacturing, research and development, and warehousing/distribution rather than heavy manufacturing. Heavy manufacturing includes about 30 percent of the City's planning area; 93 percent of this area is the Refinery (El Segundo, 1992).

Given the decreasing availability of vacant land and the reduction of new manufacturing and heavy industrial uses, the City is encouraging mixed-use development to effectively address future potential planning problems such as traffic management, infrastructure constraints, and parking (El Segundo, 1992).

The strip of development on the north side of El Segundo Boulevard between Main Street and Sepulveda Boulevard is part of the Smoky Hollow Specific Plan. This area houses some of the City's older industrial uses, but the Specific Plan allows for a combination of industrial, retail, office, and residential uses (El Segundo, 1992).

Montebello Terminal

The Montebello Terminal is located in the City of Montebello's industrial planning district. No significant changes in the boundaries or composition of this land use district are planned, and industrial uses would continue to be focused in the southern portion of the city (City of Montebello, 1990). A review of the City's Redevelopment Element indicates no specific plans for redevelopment or planned changes of the residential area north of the terminal site (Duong, 2000)

Van Nuys Terminal

The Van Nuys Terminal is located in the City of Los Angeles' Van Nuys-North Sherman Oaks planning district. No significant changes in the boundaries or composition of this area are planned (Rigamet, 2000).

Huntington Beach Terminal

According to the City of Huntington Beach General Plan, industrial uses comprise approximately eight percent of the City's total land area (City of Huntington Beach, 1998). No changes to land uses are planned for the existing areas designated for industrial development (City of Huntington Beach, 1998).

3.8 Noise

Noise is usually defined as sound that is undesirable because it interferes with speech communication and hearing, is intense enough to damage hearing, or is otherwise annoying (unwanted sound). Sound levels are measured on a logarithmic scale in decibels (dB). The universal measure for environmental sound is the “A” weighted sound level, dBA, which is the sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. “A” scale weighting is a set of mathematical factors applied by the measuring instrument to shape the frequency content of the sound in a manner similar to the way the human ear responds to sounds. A complete discussion of noise measurement, perception, effects, and regulations is included as Appendix E.

3.8.1 Guidelines and Local Ordinances

Noise impacts from the operation and construction of the proposed project at the Refinery and terminals are determined by the local city noise regulations summarized in Table 3.8-1, and by an incremental increase in existing noise. In addition, most community local noise elements contain land use compatibility standards required by the State of California. Figure 3.8-1 shows state land use categories and the recommended noise levels associated with each.

Table 3.8-1
Local Noise Guidelines and Ordinances

City	Facility	Construction Limit	Operations Limit (exterior dBA except where noted)
El Segundo	Refinery	L_{50}= 65 dBA No construction noise from 6:00 PM to 7:00 AM or Sundays/holidays	Residential[a]: L_{50}= 5 dBA over ambient noise level; Commercial/Industrial[a]: L_{50}= 8 dBA over ambient noise level
Manhattan Beach	Refinery	Construction allowed: Monday through Friday 7:30 AM to 6:00 PM, Saturday 9:00 AM to 6:00 PM, and Sunday 10:00 AM to 4:00 PM	Residential[ac]: L_{50}= 50 dBA (daytime) Commercial[ac]: Residential limits + 15 dBA Industrial[a]: Residential limits + 20 dBA
Los Angeles	Van Nuys Terminal	75 dBA at 50 feet within 500 feet of residential zone when technically feasible	Agricultural/Residential [bdef]: L_{25}=55dBA (7 AM to 10 PM) Commercial[cdef]: L_{25}=65dBA Industrial/Zones (M1, MR1, MR2)[def]: L_{25}=70dBA Industrial (Zones M2, M3)[def]: L_{25}=75dBA
Montebello	Montebello Terminal	Construction allowed: Monday through Friday 7:00 AM to 8:00 PM and Saturday and Sunday 9:00 AM to 6:00 PM	Residential[acde]: L_{50}= 65 dBA (7 AM to 10 PM); and L_{50}= 60 dBA (10 PM to 7 AM) Commercial[ade]: L_{50}= 70 dBA Industrial[ade]: L_{50}= 75 dBA
Huntington Beach	Huntington Beach Terminal	No construction noise from 8:00 PM to 7:00 AM or Sundays/holidays	Zone 1 (residential)[acde]: L_{50}= 55 dBA (7 AM to 10 PM) at residential properties Zone 2 (professional offices/public institutional properties)[ade]: L_{50}= 55 dBA (residences) Zone 3 (commercial)[ade]: L_{50}= 70 dBA (residences) Zone 4 (industrial)[ade]: L_{50}= 70 dBA (residences) Interior Zone 1[ceg]: $L_{8.3}$= 55 dBA (7 AM to 10 PM) Interior Zones 2, 3 and 4[eg]: $L_{8.3}$= 55 dBA

[a] $L_{25} = L_{50} + 5$ dBA; $L_{8.3} = L_{50} + 10$ dBA; $L_{1.7} = L_{50} + 15$ dBA; $L_{<1.7}$ or $L_{max} = L_{50} + 20$ dBA
[b] Nighttime limits (10:00 PM to 7:00 AM) are 10 dBA lower
[c] Nighttime limits (10:00 PM to 7:00 AM) are 5 dBA lower
[d] If ambient noise exceeds limit then limit is increased to ambient noise
[e] Tonal or impulsive type noise also reduces limit by 5 dBA
[f] $L_{8.3} = L_{25} + 5$ dBA; $L_{<8.3} = L_{25} + 10$ dBA
[g] $L_{1.7} = L_{8.3} + 5$ dBA; $L_{max} = L_{8.3} + 10$ dBA
L_x, - A-weighted sound level, L, that may not be exceeded more than “x” percent of any one hour time period
L_{max} – Maximum A-weighted sound level

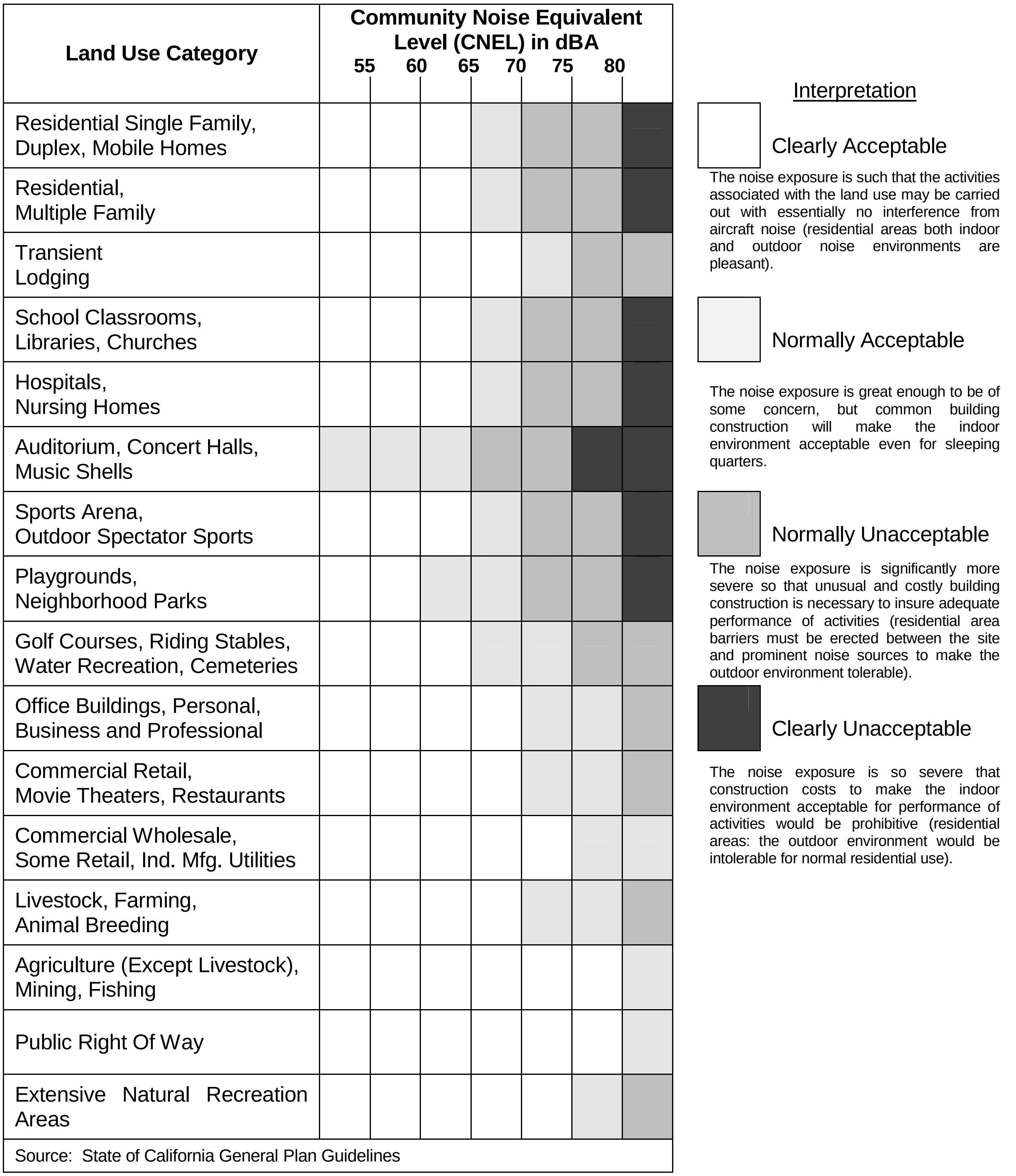


Figure 3.8-1 Land Use Compatibility for Community Noise Environments

City of El Segundo

The Refinery is located within the City of El Segundo. El Segundo's Municipal Code, Section 9.06, limits construction noise to 65 dBA in the daytime (7:00 AM to 6:00 PM). In addition, construction occurring between 6:00 PM and 7:00 AM, or on Sundays or holidays may not cause a disturbance.

El Segundo's municipal code also limits operational noise to specific statistical sound levels, Lx, where "L" is the A-weighted sound level that may not be exceeded over "x" percent of the measured time period. El Segundo bases its noise limits on a 60-minute period and specifies L_{50} (30 minutes of every hour) limits for two zone types: residential and commercial/industrial. El Segundo limits are summarized for residential and commercial/industrial zones in Table 3.8-1 and limit the L_{50} to five dBA above ambient (existing) sound level for residential zones and eight dBA above ambient for commercial or industrial zones.

City of Manhattan Beach

The City of Manhattan Beach is located adjacent to the southern boundary of the Refinery. The City of Manhattan Beach Noise Ordinance Number 1957, Chapter 5.48.160, limits noise from construction to Monday through Friday from 7:30 AM to 6:00 PM, Saturday from 9:00 AM to 6:00 PM, and Sunday from 10:00 AM to 4:00 PM.

The City of Manhattan Beach noise ordinance limits operational noise according to zone designation to a 60-minute L_{50}, L_{25}, $L_{8.3}$, $L_{1.7}$, and L_{max}. The Refinery and adjoining properties are located in a mix of residential, commercial, and industrial zones. Noise limits for these zones are summarized in Table 3.8-1.

City of Los Angeles

The Van Nuys Terminal is located within the City of Los Angeles. The Los Angeles Municipal Code Section 111 limits construction noise to 75 dBA at 50 feet within 500 feet of residential zones when technically feasible.

The Los Angeles Municipal Code also limits operational noise according to zone designation to a 60 minute L_{25}, $L_{8.3}$, $L_{1.7}$, and L_{max}. The Van Nuys Terminal and adjoining properties are zoned M3 and PF with exterior noise limits as summarized in Table 3.8-1. Interior noise levels are limited within residences to 35 dBA nighttime (10:00 PM to 7:00 AM) and 45 dBA daytime; within schools to 45 dBA daytime and within hospitals to 40 dBA. If the existing ambient noise already exceeds noise limits, then the limits are raised in five dBA increments to encompass the high ambient noise. Noise ordinance limits are reduced by five dBA for tonal or impulsive noise sources.

City of Montebello

The Montebello Terminal is located within the City of Montebello. The Montebello Municipal Code Chapter 17.22 does not address construction noise, but limits operational noise according to zone designation to a 60-minute L_{25}, $L_{8.3}$, $L_{1.7}$, and L_{max}. The Montebello Terminal is located in an industrial zone and adjoining properties are zoned low-density residential. Exterior noise limits for these zones are summarized in Table 3.8-1.

City of Huntington Beach

The Huntington Beach Terminal is located within the City of Huntington Beach. The City of Huntington Beach General Plan Chapter 8.40 prohibits construction noise from occurring between 8:00 PM and 7:00 AM, or on Sundays or holidays.

The Huntington Beach Municipal Code limits outdoor and indoor operational noise to a 60-minute L_{50}, L_{25}, $L_{8.3}$, $L_{1.7}$, and L_{max}. for residential, office/public, commercial, and industrial zone types. The Huntington Beach Terminal is zoned general industrial and adjoining properties are located in a mix of public use and light commercial/industrial zones. Huntington Beach noise limits are summarized in Table 3.8-1.

3.8.2 Existing Noise Environment

Refinery

The Refinery land use is generally designated commercial and residential to the north, industrial, open, and public land to the east, residential to the south, and industrial to the west. Land uses are further described in Section 3.7. The ambient noise environment in the project vicinity is composed of the contributions from equipment and operations within these commercial and industrial areas, and from the traffic on roads along or near each of its property boundaries (El Segundo Boulevard, Sepulveda Boulevard, Rosecrans Avenue, and Vista Del Mar).

The nearest sensitive receptors of Refinery noise are residences located in the City of Manhattan Beach, approximately 200 to 400 feet south of the Refinery along Rosecrans Avenue. The next nearest sensitive receptors are residences approximately ⅛-mile north of the Refinery.

A noise survey was performed north of the Refinery on December 15 through 17, 2000, and south of the Refinery on January 5 through 6, 2001 and January 13 through 17, 2001. Results of the noise survey are summarized in Table 3.8-2, and discussed in further detail in Appendix E. The noise survey locations are shown on Figure 3.8-2. Based on the noise survey, the existing community noise equivalent level (CNEL) in the residential area to the south of the Refinery is 59 to 62 dBA and in the “normally acceptable” to “conditionally acceptable” range for residential land use categories. Also, based on the survey, the existing CNEL in the vicinity of commercial and residential areas to the north of the Refinery is 61 to 63 dBA and in the "normally acceptable" range for both commercial and residential land use.

The existing CNEL noise environment in the vicinity of commercial and park receptors to the west and east of the Refinery are estimated to be 60 to 65 dBA based on the CNEL noise contours in the El Segundo General Plan, and are in the "normally acceptable" range for their respective land use categories according to the State of California General Plan Guidelines.

Table 3.8-2
Noise Survey Results

Location	Description	Zoning Designation	Date/Time Period	CNEL[1] (dBA)	L50[2] (dBA)
1	Gate 20 - Refinery south property line	Industrial	Jan. 17-18, 2001/1400 - 1400	70	53-65
2	Gate 21 - Refinery south property line	Industrial	Jan. 13-14, 2001/1600 - 1600 Jan. 14-15, 2001/1600 - 1600 Jan. 16-17, 2001/1300 - 1300	71 71 71	56-65 56-65 56-65
3	Gate 22 - Refinery south property line	Industrial	Jan. 5-6, 2001/1400 - 1400	67	54-63
4	3600 Pine Ave. - ~500 ft. south of Gate 20	Residential	Jan. 17-18, 2001/1500 - 1500	62	50-57
5	Pacific Ave. - ~900 ft. south of Gate 21	Residential	Jan. 16-17, 2001/1300 - 1300	61	50-59
6	Armory Ave. - ~200 ft. south of Gate 22	Residential	Jan. 5-6, 2001/1400 - 1400	59	49-54
7	Lomita Ave. and El Segundo Blvd. - near north property line of Refinery	Commercial	Dec. 15-16, 2000/1600 - 1600	72	61-67
8	Lomita Ave. and Franklin Ave. - ~600 ft. north of Refinery	Commercial	Dec. 16-17, 2000/1900 - 1900	63	52-61
9	Lomita Ave. at school behind St. Anthony's Church - ~1,000 ft. north of Refinery	Commercial/ Residential	Dec. 16-17, 2000/1900 - 1900	61	47-61

1. CNEL – Community Noise Equivalent Level - 24-hr A-weighted sound level from weighted average of hourly equivalent sound level.
2. L_{50}, - A-weighted sound level that occurred 50 percent of any one hour time period.

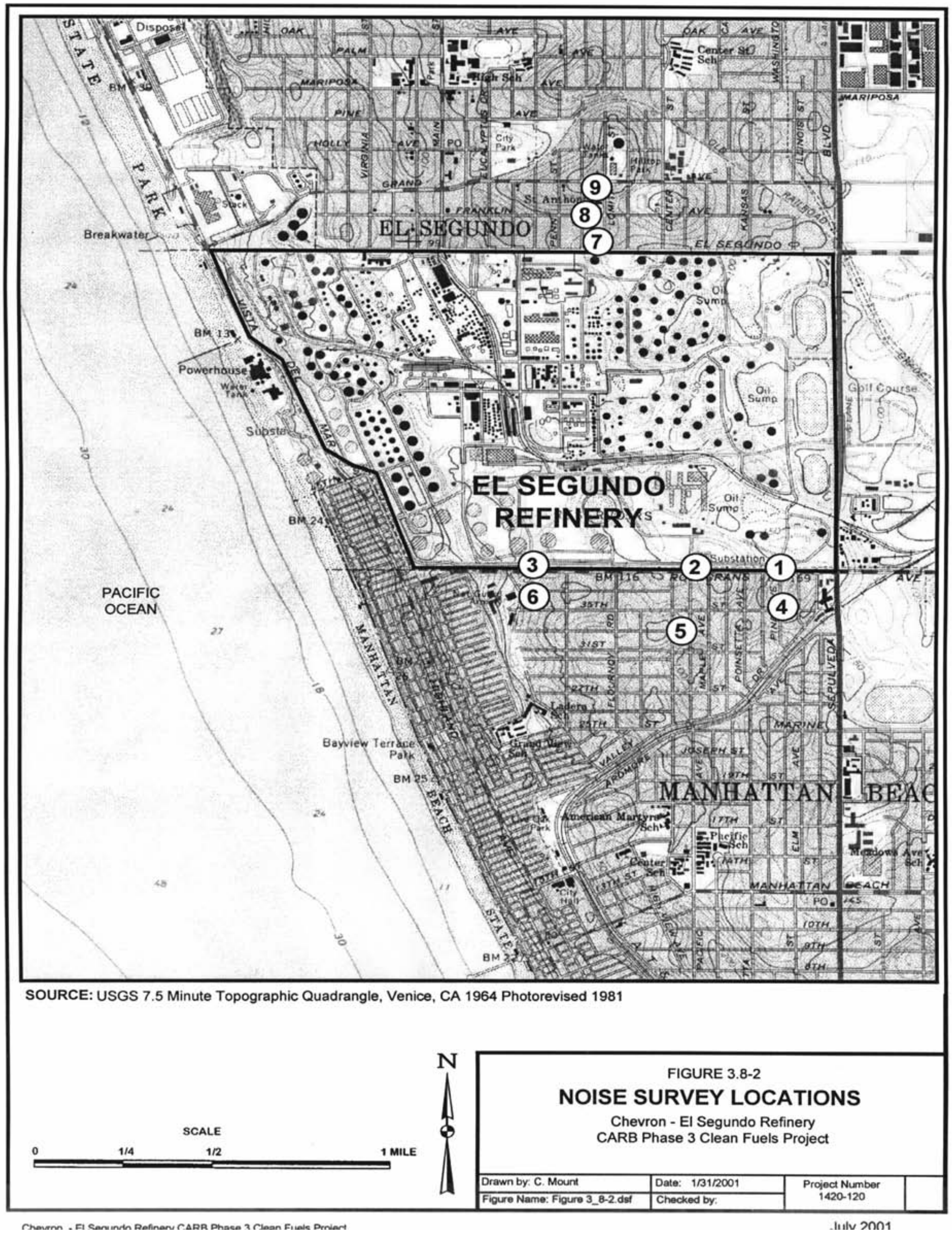


Figure 3.8-2 Noise Survey Locations

Van Nuys Terminal

Land uses around the Van Nuys Terminal include primarily industrial zoning with some open space land use zones to the west beyond I-405. The ambient noise environment in the terminal vicinity is composed of the contributions from equipment and operations within these commercial and industrial areas; a railroad to the north; and traffic on I-405, Sepulveda Boulevard, and Oxnard Street. The nearest receptors are several commercial businesses to the immediate south and residences approximately ¼-mile away to the north, northeast, and southeast.

The existing ambient CNEL around the Van Nuys Terminal has not been measured. The estimated ambient CNEL noise environment in the vicinity of Van Nuys is expected to be 65 to 75 dBA surrounding the terminal, and 55 to 65 dBA in the nearby residential area based on the "normally acceptable" state land use compatibility ranges of the current land uses.

Montebello Terminal

Land use within approximately ¼-mile of the Montebello Terminal is designated industrial to the northeast, east, south, and west, and low density residential to the north. The ambient noise environment in the terminal vicinity is composed of the contributions from terminal operations within these industrial areas, the railroad tracks to the north, and from the traffic on Garfield Avenue to the west and Vail Avenue to the east. The nearest residences lie approximately 100 feet north of the Montebello Terminal property line just north of the railway.

The existing ambient CNEL around the Montebello Terminal has not been measured. The estimated ambient CNEL noise environment in the vicinity of the Montebello Terminal is expected to be 65 to 75 dBA in the industrial areas, and 60 to 65 dBA in the residential area, based on the "normally acceptable" state land use compatibility ranges for the current land uses.

Huntington Beach Terminal

Land uses surrounding the Huntington Beach Terminal include public facilities to the south, west, and north, and light industrial/commercial to the east. The ambient noise environment in the terminal vicinity is composed of the contributions from terminal operations traffic on Talbert Avenue to the south and Gothard Street to the east. The nearest sensitive receptor is the Huntington Central Park to the north, south, and west of the Terminal. Huntington Central Park is a regional park encompassing several hundred acres of open space, equestrian trails, and camping facilities.

The existing ambient CNEL around the Huntington Beach Terminal has not been measured. The estimated CNEL noise environment in the vicinity of Huntington Beach Terminal is expected to be 65 to 75 dBA in the commercial/industrial area, and 60 to 70 dBA in the public facility (Huntington

Central Park) area, based on the “normally acceptable” state land use compatibility ranges for the current land uses.

3.9 Public Services

As indicated in the Initial Study for the proposed project, the only public service agency that could be adversely affected by the proposed project is related to fire protection; therefore, the discussion herein is limited to fire protection services.

3.9.1 Refinery Fire Protection

Chevron maintains its own onsite fire department at the Refinery. This organization is recognized by the California State Fire Marshal’s Office as a professional functioning fire department. The Refinery fire department is regulated by both federal and state OSHA standards and adheres to National Fire Protection Association standards. The Refinery fire department is capable of responding to petroleum and structural fires, hazardous material releases and spills, and confined-space rescues.

The Refinery notifies the City of El Segundo Fire Department when an incident occurs that may impact the environment or pose a life safety hazard to employees or the public. The Refinery also maintains a mutual aid agreement with other refineries in the Los Angeles area. Under this mutual aid agreement, the Refinery can request the assistance and resources of other refineries to control and manage a major incident.

Chevron’s fire department includes 20 full-time members. A four-person crew is on duty at the Refinery at all times. In addition, a Fire Prevention Officer and the Fire Chief are on duty Monday through Friday during the day shift. Fire and rescue personnel are trained on an on-going basis. The on-duty fire crews are also supported by volunteer firemen who are trained to assist in the event of an emergency.

The Refinery is also served by the City of El Segundo Fire Department, which maintains two fire stations within the city limits. All personnel are certified Emergency Medical Technicians. Average response time for all facilities within city limits is between two and four minutes (Rodomsky, 2000).

3.9.2 Terminal Fire Protection

Each of the terminals maintains a Fire Control Plan, which outlines procedures for employee training and control tactics for fire emergencies. The Fire Control Plans are updated annually and are reviewed with the local fire departments. Additionally, annual hypothetical drills are conducted with the local fire departments. The Fire Control Plans include procedures to follow for different fire emergency scenarios, as well as the various foam or water requirements to control the fires.

In addition to the Fire Control Plans, the terminals have been designed with fire protection/safety features to minimize fire emergencies. For example, storage tanks are equipped with leak detection systems and are contained inside berms to minimize spills and leaks. Other fire protection safety features include foam storage and dispensing systems on loading racks and fire hydrants installed on terminal property.

The following is a summary of the local fire departments serving each of the terminal sites and each of the fire department's average emergency response times:

- Fire protection services for the Van Nuys Terminal are provided by the City of Los Angeles Fire Department's Station 39 at 14415 Sylvan Street. Station 39 has an average response time of three minutes (Barrios, 2000).
- Fire protection services for the Montebello Terminal are provided by the City of Montebello Fire Department's Station 2 located at the intersection of Date and Greenwood. Station 2 has an average response time of three to four minutes (Gatt, 2000).
- Fire protection services for the Huntington Beach Terminal are provided by the City of Huntington Beach Fire Department's Gothard Station. Average response time to an emergency call is five minutes (Groat, 2000).

3.10 Solid and Hazardous Waste

Current waste disposal practices at the Refinery and the terminal sites are presented in this section.

3.10.1 Nonhazardous Solid Waste

Chevron currently uses the Bradley Canyon Landfill located in Sun Valley, California, for the disposal of nonhazardous solid waste. This landfill is owned by Waste Management and is permitted to receive a maximum of 10,000 tons of solid waste per day (Workman, 2001). The Bradley Canyon Landfill is expected to close in 2007; however, the landfill will likely reduce the daily amount accepted beginning in 2003 (Workman, 2001).

The LACSD maintains three active Class III landfills that handle approximately 20,000 tons per day of nonhazardous solid waste. These landfills include Puente Hills Landfill, Scholl Canyon Landfill, and Calabasas Landfill. Projected closure dates for the three landfills range from 2003 at Puente Hills Landfill to 2018 at Scholl Canyon. Permitted daily capacity ranges from 3,500 tons per day at Calabasas to 13,200 tons per day at Puente Hills (Nellor, 2000).

Orange County Integrated Waste Management Department (OCIWMD) maintains three active Class III landfills that are permitted to accept nonhazardous solid waste. These landfills include the Frank R. Bowerman Landfill in Irvine, the Olinda Alpha Landfill in Brea, and the Prima Deshecha Landfill in San Juan Capistrano. The Frank R. Bowerman Landfill is currently authorized to receive an annual average of 7,015 tons of waste per day and is permitted to receive a daily maximum of no more than 8,500 tons per day. Frank R. Bowerman Landfill opened in 1990 and is scheduled to close in approximately 2024. Olinda Alpha is currently authorized to receive an annual average of 7,000 tons of waste per day and is permitted to receive a daily maximum of no more than 8,000 tons per day. Olinda Alpha opened in 1960 and is scheduled to close in approximately 2013. Prima Deshecha Landfill is permitted to accept up to 4,000 tons of waste per day. Prima Deshecha was opened in 1976 and is scheduled to close in approximately 2040 (County of Orange, 2000).

3.10.2 Hazardous Waste

There are three Class I landfills in California that are approved to accept hazardous wastes. Chemical Waste Management Corporation in Kettleman City is a treatment, storage, and disposal facility that has a permitted capacity of 10 million cubic yards and an expected closure date of 2020 (SCAQMD, 2000). Safety-Kleen Corporation operates a Class I landfill in Buttonwillow, Kern County, California that has a permitted capacity of 10.7 million cubic yards and an expected closure date of 2007 (SCAQMD, 2000). Safety-Kleen maintains an additional Class I facility in Imperial County that has a permitted capacity of 2.6 million cubic yards, a remaining capacity of 0.2 million cubic yards, and an expected closure date of 2005 (SCAQMD, 2000).

3.10.3 Waste Minimization

Chevron maintains a Source Reduction Evaluation Plan as required under the Hazardous Waste Source Reduction and Management Review Act of 1989 (Senate Bill 14). The waste minimization strategies used at the Refinery include recycling, loss prevention, employee training programs, and waste segregation.

3.11 Transportation/Circulation

This section describes the project sites in relation to the regional transportation setting. The existing circulation system is discussed, and existing traffic volumes and levels of service are summarized.

3.11.1 Surrounding Highway Network

Regional facilities in the vicinity of the project are illustrated in Figure 1.1-1 in Chapter 1, and provide excellent accessibility to the entire southern California region. The Refinery site is located west of the San Diego Freeway (Interstate 405) and provides full ramp connections at El Segundo Boulevard and Rosecrans Avenue. In addition, the Glenn M. Anderson Freeway (I-105) and its related rail transit is immediately north of the Refinery. The Montebello Terminal is located approximately 1.5 miles north-northeast of the Santa Ana Freeway (I- 5) and approximately three miles west of Interstate 605. The Van Nuys Terminal is located immediately east of I-405 and approximately one mile north of Highway 101. The Huntington Beach Terminal is located approximately three miles west-southwest of Interstate 405 and approximately two miles from the Pacific Coast Highway (Highway 1).

In addition to the vehicular system, the project sites are serviced by a network of railroad facilities. This system provides an alternative mode of transportation for the distribution of goods and materials. The railroad network includes an extensive system of private railroads and several publicly-owned freight lines. The Southern California Regional Rail Authority operates commuter rail systems in the Los Angeles area. Additionally, Amtrak provides inter-city service, principally between San Diego and San Luis Obispo. The Los Angeles area is served by two main-line freight railroads, the Burlington Northern Santa Fe and the Union Pacific Railroad. These freight railroads connect southern California with other U.S. regions, Mexico, and Canada via their connections with other railroads.

3.11.2 Local Roadways and Circulation Routes

A traffic analysis was performed for the project by Austin-Foust Associates. The analysis is included in Appendix F. The anticipated construction traffic at the Montebello, Van Nuys, and Huntington Beach Terminals is forecast to be below the Congestion Management Program (CMP) guidelines. The CMP is a state-mandated program to improve mobility and reduce traffic congestion to acceptable levels. Construction-generated traffic at these facilities will be less than 50 trips per hour. Operation-generated vehicular traffic at these sites will be less than 30 trips per day. Access to these sites is available via direct access routes to regional roadway and freeway facilities. Based on the minimal anticipated impacts, the existing traffic conditions in the vicinity of the Van Nuys and Huntington Beach Terminals are not included in this section and will not be further analyzed in Chapter 4.

The rail car deliveries at the Montebello Terminal are expected to have an affect on vehicular traffic on Vail Avenue (adjacent to the east of the terminal) and to a lesser extent on Maple Avenue. Thus, an analysis of the impacts on traffic on Vail Avenue and Maple Avenue due to operation of the rail spur at the Montebello Terminal is included in Chapter 4. The rail car delivery of ethanol is proposed to occur Monday through Friday between 10:00 AM and 1:00 PM, with traffic on Vail Avenue blocked for up to 9.5 minutes total per day with the longest continuous closure being up to four minutes during this three -hour window. The interruption along Maple Avenue will be up to two minutes per day. Traffic volume counts for Vail Avenue were collected every 15 minutes for a 24-hour period on a typical weekday. Table 3.11-1 summarizes the observed traffic volumes on the portion of Vail Avenue between Mines Street and the Union Pacific Railroad right-of-way. Table 3.11-2 summarizes the observed traffic volumes on portions of Maple Avenue between Mines Street and the Union Pacific Railroad right-of-way.

Table 3.11-1
Existing Traffic Volumes on Vail Avenue

15-Minute Increment	AM Volumes			PM Volumes		
	NB	SB	Total	NB	SB	Total
12:00-12:15	7	5	12	82	46	128
12:15-12:30	1	4	5	46	42	88
12:30-12:45	7	4	11	**66**	**76**	**142**
12:45-1:00	5	3	8	69	48	117
1:00-1:15	3	1	4	67	54	121
1:15-1:30	2	7	9	45	73	118
1:30-1:45	2	4	6	66	66	132
1:45-2:00	4	1	5	47	51	98
2:00-2:15	2	5	7	68	56	124
2:15-2:30	1	1	2	55	49	104
2:30-2:45	0	4	4	114	54	168
2:45-3:00	3	3	6	56	50	106
3:00-3:15	2	5	7	84	60	144
3:15-3:30	7	5	12	49	57	106
3:30-3:45	2	2	4	124	64	188
3:45-4:00	4	8	12	77	60	137
4:00-4:15	5	3	8	92	60	152
4:15-4:30	8	6	14	86	74	160
4:30-4:45	6	12	18	128	58	186
4:45-5:00	10	20	30	118	76	194
5:00-5:15	6	8	14	146	96	242
5:15-5:30	14	18	32	106	64	170
5:30-5:45	14	54	68	124	78	202
5:45-6:00	24	58	82	67	65	132
6:00-6:15	17	22	39	61	52	113
6:15-6:30	28	36	64	50	46	96
6:30-6:45	25	66	91	43	49	92
6:45-7:00	48	70	118	42	46	88

Table 3.11-1 (concluded)
Existing Traffic Volumes on Vail Avenue

15-Minute Increment	AM Volumes			PM Volumes		
	NB	SB	Total	NB	SB	Total
7:00-7:15	44	61	105	56	40	96
7:15-7:30	64	82	146	44	22	66
7:30-7:45	118	110	228	30	36	66
7:45-8:00	64	140	204	23	33	56
8:00-8:15	80	68	148	17	27	44
8:15-8:30	38	66	104	33	22	55
8:30-8:45	42	72	114	27	23	50
8:45-9:00	45	44	89	20	24	44
9:00-9:15	38	47	85	25	17	42
9:15-9:30	21	31	52	22	19	41
9:30-9:45	60	30	90	12	16	28
9:45-10:00	39	33	72	25	13	38
10:00-10:15	44	28	72	23	15	38
10:15-10:30	37	48	85	16	7	23
10:30-10:45	36	40	76	19	10	29
10:45-11:00	28	39	67	11	14	25
11:00-11:15	54	30	84	14	8	22
11:15-11:30	46	38	84	7	21	28
11:30-11:45	41	31	72	7	6	13
11:45-12:00	42	44	86	12	5	17

Table 3.11-2
Existing Traffic Volumes on Maple Avenue

15-Minute Increment	AM Volumes			PM Volumes		
	NB	SB	Total	NB	SB	Total
12:00-12:15	3	8	11	52	42	94
12:15-12:30	7	1	8	42	37	79
12:30-12:45	1	2	3	30	52	82
12:45-1:00	3	0	3	32	40	72
1:00-1:15	5	0	5	40	30	70
1:15-1:30	8	0	8	32	34	36
1:30-1:45	3	2	5	50	38	88
1:45-2:00	5	3	8	64	42	106
2:00-2:15	1	4	5	56	52	108
2:15-2:30	8	28	10	32	44	76

Table 3.11-2 (continued)
Existing Traffic Volumes on Maple Avenue

15-Minute Increment	AM Volumes			PM Volumes		
	NB	SB	Total	NB	SB	Total
2:30-2:45	4	1	5	44	41	85
2:45-3:00	4	1	5	62	34	96
3:00-3:15	2	5	7	45	59	104
3:15-3:30	7	4	11	45	40	85
3:30-3:45	8	1	9	74	43	117
3:45-4:00	7	9	16	60	44	104
4:00-4:15	9	2	11	64	52	116
4:15-4:30	8	3	11	53	47	100
4:30-4:45	16	6	22	68	64	132
4:45-5:00	12	11	23	56	31	87
5:00-5:15	8	10	18	58	44	102
5:15-5:30	10	10	20	60	51	111
5:30-5:45	22	14	36	56	50	106
5:45-6:00	9	12	21	50	36	86
6:00-6:15	8	11	19	50	40	90
6:15-6:30	24	13	37	47	47	94
6:30-6:45	22	12	34	53	39	92
6:45-7:00	20	21	41	38	34	72
7:00-7:15	43	33	76	26	31	57
7:15-7:30	58	29	87	32	24	56
7:30-7:45	80	53	133	28	22	50
7:45-8:00	62	74	136	18	34	52
8:00-8:15	49	35	84	22	17	39
8:15-8:30	35	30	65	20	14	34
8:30-8:45	40	20	60	12	18	30
8:45-9:00	28	25	53	25	19	44
9:00-9:15	40	20	60	21	14	35
9:15-9:30	30	18	48	10	20	30
9:30-9:45	40	28	68	15	12	27
9:45-10:00	42	31	73	19	7	26
10:00-10:15	42	28	70	11	13	24
10:15-10:30	40	37	77	9	2	11
10:30-10:45	52	34	86	10	12	22
10:45-11:00	37	27	64	14	14	28
11:00-11:15	38	28	66	10	8	18
11:15-11:30	52	18	70	6	6	12

Table 3.11-2 (concluded)
Existing Traffic Volumes on Maple Avenue

15-Minute Increment	AM Volumes			PM Volumes		
	NB	SB	Total	NB	SB	Total
11:30-11:45	29	31	60	3	3	6
11:45-12:00	42	40	82	10	3	13

The anticipated construction traffic at the Refinery will be above CMP guidelines; therefore, local roadways and intersections in the vicinity of the Refinery were analyzed in detail (Chapter 4). The following 12 intersections, including the northbound (NB) and southbound (SB) freeway ramps, in the vicinity of the Refinery have been included in the traffic analysis:

1. Sepulveda/SR-1 & El Segundo Blvd
2. Sepulveda/SR-1 & Rosecrans Ave
3. Sepulveda/SR-1 & Imperial Hwy
4. Aviation Blvd & El Segundo Blvd
5. Aviation & Rosecrans Ave
6. La Cienega Blvd & I-405 SB on/off
7. La Cienega Blvd & El Segundo Blvd
8. I-405 SB on & El Segundo Blvd
9. I-405 NB on/off & El Segundo Blvd
10. I-405 SB off & Rosecrans Ave
11. I-405 NB on/off & Rosecrans Ave
12. Hindry Ave & I-405 SB on/off

Intersection capacity utilization values are presented in Table 3.11-3 and are a means of representing peak hour volume/capacity ratios. The intersection capacity utilization is the proportion of an hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. If an intersection is operating at 80 percent of capacity, then 20 percent of the signal cycle is not used. The signal could show red on all indications 20 percent of the time and the signal would just accommodate approaching traffic.

Table 3.11-3
Existing Level of Service Summary

Intersection	Existing AM Peak Hour Volume/Capacity Ratio	Existing PM Peak Hour Volume/Capacity Ratio
1. Sepulveda/SR-1 and El Segundo Blvd.	.969	.953
2. Sepulveda/SR-1 and Rosecrans Ave.	1.195	1.066
3. Sepulveda/SR-1 and Imperial Hwy.	.959	1.115
4. Aviation Blvd. and El Segundo	1.159	.949
5. Aviation Blvd. and Rosecrans	1.185	1.203
6. La Cienega and I-405 SB on/off	.570	.569
7. La Cienega and El Segundo	.727	.706
8. I-405 SB on and El Segundo	.852	.629
9. I-405 NB on/off and El Segundo	.865	.742
10. I-405 SB off and Rosecrans	.742	.635
11. I-405 NB on/off and Rosecrans	.695	.689
12. Hindry Avenue and I-405 SB on/off	.805	.765
Levels of Service Ranges: .00-.60 A; .61-.70 B; .71-.80 C; .81-.90 D; .91-1.0 E; Above 1.0 F		

As indicated in Table 3.11-3, five intersections (numbers 1, 2, 3, 4, and 5 above) are presently operating at an unacceptable level of service during the AM or PM peak hour under existing conditions.

Existing morning (AM) and afternoon (PM) peak hour turning movement volumes at these intersections were counted by Traffic Data Services, Inc. and are illustrated in Figures 3.11-1 and 3.11-2.

3.12 Other Issue Areas Eliminated During the Initial Study

Based on the assessment completed for the Initial Study, the following areas were eliminated from further consideration in this EIR:

- Aesthetics/Recreation
- Agricultural Resources
- Energy
- Mineral Resources
- Population/Housing

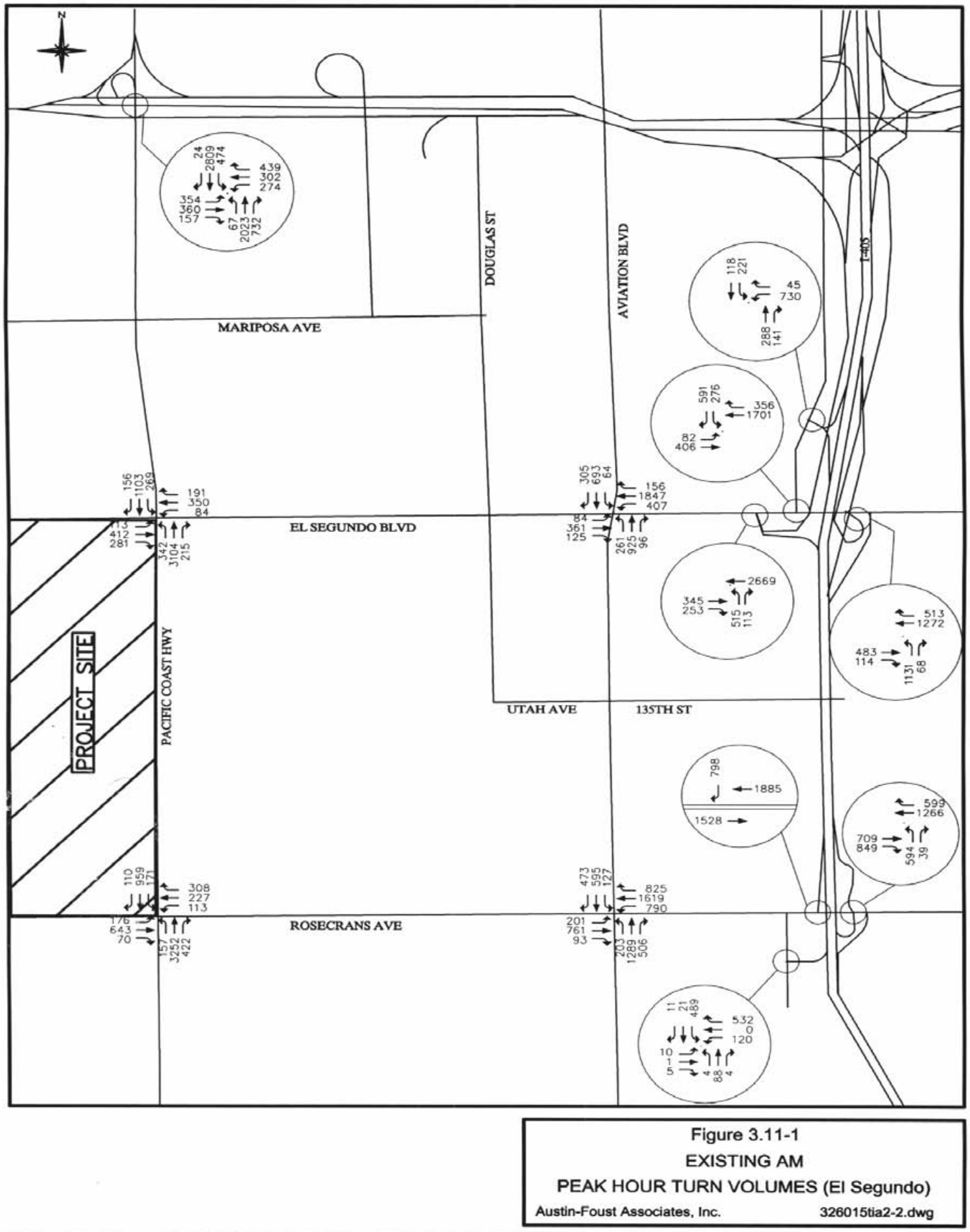


Figure 3.11-1 Existing AM Peak Hour Turn Volumes

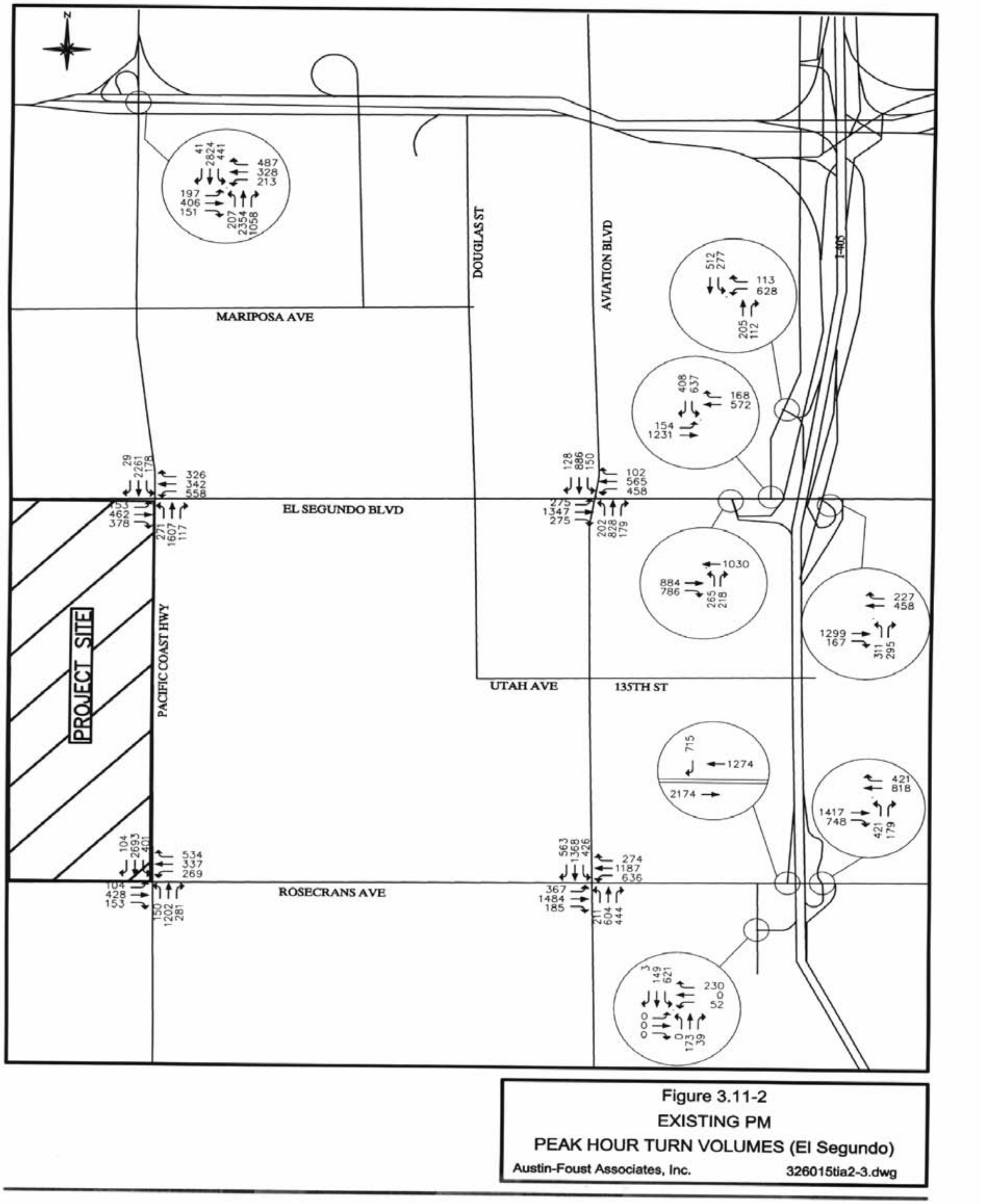


Figure 3.11-2 Existing PM Peak Hour Turn Volumes

The modifications and additions to the Refinery and the terminals are not expected to negatively affect aesthetics/recreation since the sites are located in developed industrial areas and/or equipment will be located entirely within existing Refinery/terminal boundaries. Additionally, no agricultural or mineral resources exist at the project sites. The proposed project will result in only small increases in natural gas and electricity consumption. Thus, aesthetics/recreation, agricultural resources, mineral resources, and energy would not be impacted. Labor for construction of the proposed project would be drawn from a well-supplied local labor pool and there would be no influx of workers for operation; therefore, there would be no impacts to population/housing. For a more complete treatment of these issue areas, please refer to the Initial Study in Appendix A.

LIST OF FIGURES

LIST OF TABLES