CHAPTER 3

ENVIRONMENTAL SETTING

INTRODUCTION
ENVIRONMENTAL BASELINE
AIR QUALITY
HAZARDS AND HAZARDOUS MATERIALS
TRANSPORTATION/TRAFFIC

CHAPTER 3.0

EXISTING ENVIRONMENTAL SETTING

INTRODUCTION

CEQA Guidelines §15125 requires that an EIR include a description of the environment within the vicinity of the proposed project as it exists at the time the NOP is published, or if no NOP is published, at the time the environmental analyses commences, from both a local and regional perspective. This Chapter describes the existing environment around the Paramount Refinery that could be adversely affected by the proposed project.

The environmental topics identified in this chapter include both a regional and local setting. The analyses included in this Chapter focus on those aspects of the environment that could be adversely affected by the proposed project and not those environmental topic areas that will not be significantly adversely affected by the proposed project, as determined by the Initial Study (see Appendix A).

ENVIRONMENTAL BASELINE

The appropriate baseline for an existing and previously permitted facility such as the Refinery needs to accurately reflect equipment and operations at the Refinery with existing approved permits, even if the current level of operations is less than the maximum level allowed. As discussed in the CEQA Guidelines (§15125(a)), a CEQA document must include, "a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced . . ." For a project that consists of a modification or expansion of an existing, previously permitted facility, the existing conditions include operation (and associated environmental effects) at the maximum level achieved consistent with prior approvals (permit conditions), even if that level of operation is not currently occurring. The full Refinery operated most recently during part of 1997 and portions of the equipment not currently operating have operated intermittently and continue to run presently. The Refinery has valid permits including air quality permits, conditional use permits, wastewater treatment permits, stormwater permits, and can resume operating any and all permitted units at the Refinery without additional discretionary approvals. Thus, for this project, the baseline needs to reflect the Refinery operations and equipment that are currently permitted including equipment that has not been operating or has operated on an intermittent basis recently. Therefore, the baseline will assume that all permitted equipment is operating under normal conditions.

A. AIR QUALITY

Meteorological Conditions

The proposed project site is located within the Basin, which consists of all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The climate in the Basin generally is characterized by sparse winter rainfall and hot summers tempered by cool ocean breezes. A temperature inversion, a warm layer of air that traps the cool marine air layer underneath it and prevents vertical mixing, is the prime factor that allows contaminants to accumulate in the Basin. The mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds. The climate of the area is not unique but the high concentration of mobile and stationary sources of air contaminants in the western portion of the Basin, in addition to the mountains, which surround the perimeter of the Basin, contribute to poor air quality in the region.

Temperature and Rainfall

Temperature affects the air quality of the region in several ways. Local winds are the result of temperature differences between the relatively stable ocean air and the uneven heating and cooling that takes place in the Basin due to a wide variation in topography. Temperature also has a major effect on vertical mixing height and affects chemical and photochemical reaction times. The annual average temperatures vary little throughout the Basin, averaging 75^{o}F. The coastal areas show little variation in temperature on a year round basis due to the moderating effect of the marine influence. On average, August is the warmest month while January is the coolest month. Most of the annual rainfall in the Basin falls between November and April. Annual average rainfall varies from nine inches in Riverside to 14 inches in downtown Los Angeles.

Wind Flow Patterns

Wind flow patterns play an important role in the transport of air pollutants in the Basin. The winds flow from offshore and blow eastward during the daytime hours. In summer, the sea breeze starts in mid-morning, peaks at 10-15 miles per hour and subsides after sundown. There is a calm period until about midnight. At that time, the land breeze begins from the northwest, typically becoming calm again about sunrise. In winter, the same general wind flow patterns exist except that summer wind speeds average slightly higher than winter wind speeds. This pattern of low wind speeds is a major factor that allows the pollutants to accumulate in the Basin.

The normal wind patterns in the Basin are interrupted by the unstable air accompanying the passing storms during the winter and infrequent strong northeasterly Santa Ana wind flows from the mountains and deserts north of the Basin.

Existing Air Quality

Local air quality in the Basin is monitored by the SCAQMD, which operates a network of monitoring stations throughout the Basin. CARB operates additional monitoring stations.

Criteria Pollutants: Criteria air pollutants are those pollutants for which the federal and state governments have established ambient air quality standards or criteria for outdoor concentrations in order to protect public health with a margin of safety (see Table 3-1). National Ambient Air Quality Standards were first authorized by the federal Clean Air Act of 1970 and have been set by the U.S. EPA. California Ambient Air Quality Standards were authorized by the state legislature in 1967 and have been set by the CARB. Air quality of a region is considered to be in attainment of the standards if the measured concentrations of air pollutants are continuously equal to or less than the standards.

TABLE 3-1

AMBIENT AIR QUALITY STANDARDS

POLLUTANT	NATIONAL STANDARDS	STATE STANDARDS
Ozone		
1-hour (federal)	0.12 ppm(1)	0.09 ppm
Carbon Monoxide		
1-hour	35 ppm	20 ppm
8-hour	9 ppm	9 ppm
Nitrogen Dioxide		
1-Hour	None	0.25 ppm
Annual	0.053 ppm	None
Suspended Particulates		
PM10: 24-hour	150 ug/m^3(2)	50 ug/m^3
Annual	50 ug/m^3	20 ug/m^3, AAM(3)
PM2.5: 24-hour	65 ug/m^3	None
Annual	15 ug/m^3	12 ug/m^3, AAM(3)
Sulfur Dioxide		
1-hour	None	0.25 ppm
24-hour	0.14 ppm	0.04 ppm
Annual	0.03 ppm	None
Lead		
30-Day Average	None	1.5 ug/m^3
Quarterly Average	1.5 ug/m^3	None
Sulfate		
24-hour	None	25 ug/m^3
Visibility 8-hour (10 am -6 p.m.)	None	10 miles for hours with humidity less than 70%
Hydrogen Sulfide		
1-hour	None	0.03 ppm
Vinyl Chloride		
24-hour	None	0.01 ppm

Notes:
(1) ppm = parts per million
(2) ug/m^3 = micrograms per cubic meter
(3) AAM = Annual Arithmetic Mean

Health-based air quality standards have been established by the U.S. EPA and the CARB for ozone, CO, NOx, PM10, SO_2, and lead. The California standards are more stringent than the federal air quality standards. California also has established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride. Hydrogen sulfide and vinyl chloride currently are not monitored in the Basin because they are not a regional air quality problem but are generally associated with localized emission sources. The Basin is not in attainment for CO, PM10, and ozone for both state and federal standards. The Basin, including the project area, is classified as attainment for both the state and federal standards for NOx, SO_2, sulfates, and lead.

The sources of air contaminants in the Basin vary by pollutant but generally include on-road mobile sources (e.g., automobiles, trucks, and buses), other off-road mobile sources (e.g., airplanes, ships, trains, construction equipment, etc.), residential/commercial sources, and industrial/manufacturing sources.

Mobile sources account for approximately 63 percent of VOC emissions, 90 percent of the NOx emissions, 57 percent of SOx emissions, 97 percent of the CO emissions, and 14 percent of PM10 emissions in the Basin (SCAQMD, 2003).

Regional Air Quality: The SCAQMD monitors levels of various criteria pollutants at 30 monitoring stations. In 2002, the district exceeded the federal and state standards for ozone at most monitoring locations on one or more days. The federal and state one-hour ozone standards were exceeded thirty-two and eighty-one days respectively. The East and Central San Bernardino Mountains and the Santa Clarita Valley exceeded standards most frequently. Other areas that exceeded the state ozone standards included the San Gabriel Valley, San Fernando Valley, Riverside County including the Coachella Valley and San Bernardino Valley.

In 2002, the state and federal maximum concentrations of CO were exceeded one day in the Basin in South Central Los Angeles.

The federal PM10 standards were not exceeded in the Basin in 2002. The state PM10 standards were exceeded at all of the monitoring locations in the Basin including the coast, central Los Angeles, East San Fernando Valley, East San Gabriel Valley, Santa Clarita Valley, Central Orange County, Saddleback Valley, Riverside County excluding Metropolitan Riverside County 2 and Lake Elsinore, the Coachella Valley and, San Bernardino County. The state standard was exceeded on a total of ninety days in the Basin in 2002. The federal PM2.5 standard was exceeded on ten monitoring locations in the Basin.

In 2002, neither federal nor state standards for NO_2, SO_2, lead and sulfates were exceeded. Currently, the district is in attainment with the ambient air quality standards for lead, SO_2, and NO_2 (SCAQMD, 1998). The SCAQMD predicts that the Basin will comply with the federal PM10 requirements by 2006, and the federal ozone standard by 2010 (SCAQMD, 2003). Compliance with the state standards for ozone and PM10 are not expected until after 2010 (SCAQMD, 2003).

Local Air Quality: The project site is located within the SCAQMD's South Central Los Angeles monitoring area. Recent background air quality data for criteria pollutants for the South Central Los Angeles monitoring station are presented in Table 3-2. The data generally indicate an improvement in air quality in recent years with decreases in the maximum concentrations of most pollutants. Air quality in the South Central Los Angeles monitoring area is considered to be in attainment for the state and federal ambient air quality standards for NOx, SOx, lead, and sulfate. The air quality in the area also is in compliance with the federal eight-hour ozone standard, the 24-hour and annual PM10 standard and the PM2.5 federal standard. The air quality in the South Central Los Angeles area is not in compliance with the state and federal eight-hour CO standard.

Refinery Air Quality Baseline: The Paramount Refinery baseline includes the maximum level achieved consistent with prior approved operations. For example, although the entire Refinery operated as recently as 1997, the air quality baseline is a combination of annual emissions data from 1994 – 1995 and 2001-2002. Emissions for currently non-operating units are based on the 1994-1995 annual emissions data, the last full year in which these units all were operating at the same time. The resulting emissions for the non-operating units are then added to the 2001-2002 annual emissions for currently operating units in order to generate the baseline for the entire Refinery. The emissions of criteria pollutants during the Refinery baseline phase are as follows: 339 lbs/day of CO, 1,237 lbs/day of VOCs, 758 lbs/day of NOx, 356 lbs/day of SOx, and 156 lbs/day of PM10 and are shown in Table 3-3.

Toxic Air Contaminants

The California Health and Safety Code (§39655) defines a toxic air contaminant (TAC) as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health. Under California's toxic air contaminant program (Assembly Bill 1807, Health and Safety Code §39650 et seq.), the CARB, with the participation of the local air pollution control districts, and the Office of Environmental Health Hazard Assessment (OEHHA) identifies TACs and sets control standards. OEHHA evaluates the potential health effects of these substances and estimates the levels of exposure that may cause or contribute to adverse health effects. The general goal of this program is to reduce public exposure to non-carcinogens to levels below which they will not cause or contribute to adverse health effects, and for carcinogens, to minimize exposure to TACs to the maximum extent feasible.

Ambient monitoring for TACs is limited compared to monitoring for criteria pollutants because toxic pollutant impacts are typically more localized than criteria pollutant impacts. CARB conducts air monitoring for a number of toxic air contaminants every 12 days at approximately 20 sites throughout California (CARB, Mike Redgrave, personal communication, April 1999). Paramount is located closest to the North Long Beach monitoring station. Table 3-4 presents a summary of 1999-2001 to average TAC data from this site. CARB considers this data to appropriately represent background TAC levels for the Long Beach area, which is the closest TAC monitoring station to Paramount’s Refinery.

TABLE 3-2

AMBIENT AIR QUALITY
SOUTH CENTRAL LOS ANGELES COUNTY MONITORING STATION (2000-2002)
Maximum Observed Concentrations

CONSTITUENT	2000	2001	2002
Ozone:			
1-hour (ppm)	0.09	0.077	0.072
Federal Standard	(0)	(0)	(0)
State Standard	(0)	(0)	(0)
8-hour (ppm)	0.064	0.061	0.053
Carbon Monoxide:			
1-hour (ppm)	13	12	16
8-hour (ppm)	10	7.71	10.1
Nitrogen Dioxide:			
1-hour (ppm)	0.14	0.15	0.14
Annual (ppm)	0.0386	0.0369	0.0357
PM10:			
24-hour (ug/m^3)	105	91	65*
Federal standard	(0)	(0)	(0)
State standard	(12)	(10)	(8)
Annual (ug/m^3)			
Geometric	34	34.8	37.6
Arithmetic	37.6	37.4	39.3
PM2.5:			
24-hour (ug/m^3)	82.1	73.1	64.0
Federal standard	(2)	(3)	0
Annual (ug/m^3)	23	24.5	23.3
Sulfur Dioxide:			
1-hour (ppm)	0.05	0.05	0.02
24-hour (ppm)	0.014	0.012	0.016
Annual (ppm)	0.0015	--	--
Lead:			
30-day (ug/m^3)	0.09	0.23	0.04
Quarter (ug/m^3)	0.06	0.12	0.04
Sulfate:			
24-hour (ug/m^3)	11.4	15.4	15.3

Source: SCAQMD Air Quality Data Annual Summaries 2000-2002.
Notes: (18) = Number of days or percent of samples exceeding the state standard, -- = Not monitored, ppm = parts per million, ug/m^3 = micrograms per cubic meter, * Data from Central Los Angeles station since no data were collected for South Central Los Angeles monitoring station

TABLE 3-3

REFINERY BASELINE EMISSIONS

Emission Source	Reference	Criteria Pollutant				
		CO	VOC	NOx	SOx	PM10
Hydroprocessing	1994-1995 AER*	34,901	6,108	121,758	87,088	18,323
Tanks	1994-1995 AER**	0	57,897	0	0	0
Current Refinery Operations	2001-2002 AER	88,821	387,483	155,063	42,999	38,666
Total Baseline Emissions (lbs/yr)		123,722	451,487	276,821	130,087	56,990
Total Baseline Emissions (lbs/day)		339	1,237	758	356	156

* AER – Annual Emission Fee Report. Emissions for non-operating units are based on 1994-1995 annual emissions data. Emissions from operating units are based on 2001-2002 annual emissions data.

** Adjusted to reflect maximum operating throughput.

TABLE 3-4

AMBIENT AIR QUALITY
TOXIC AIR CONTAMINANTS – NORTH LONG BEACH
1999-2000

POLLUTANT	ANNUAL AVERAGE	POLLUTANT	ANNUAL AVERAGE
VOC's	ppb/v(1)		ppb/v
Acetaldehyde(2)	0.00	Methyl Ethyl Ketone(3)	0.78
Benzene	1.05	Methyl Tertiary Butyl Ether(3)	2.53
1,3-Butadiene	0.30	Methylene Chloride(3)	0.65
Carbon Tetrachloride(3)	0.10	Perchloroethylene(3)	0.17
Chloroform	0.04	Styrene(2)	0.00
o-Dichlorobenzene(3)	0.08	Toluene	2.31
p-Dichlorobenzene(3)	0.13	Trichloroethylene(3)	0.03
Ethyl Benzene	0.39	meta-Xylene	1.10
Formaldehyde(3)	2.88	ortho-xylene	0.38
Methyl Chloroform(3)	0.10		
PAH's	nanograms/m^3(4)		nanograms/m^3
Benzo(a)pyrene	0.13	Benzo(k)fluoranthene	0.07
Benzo(b)fluoranthene	0.17	Dibenz(a,h)anthracene	0.03
Benzo(g,h,i)perylene	0.54	Indeno(1,2,3-cd)pyrene	0.25

TABLE 3-4 (Concluded)

Inorganic Compounds	nanograms/m^3		nanograms/m^3
Aluminum(5)	1,430.0	Nickel(5)	6.3
Antimony(5)	4.1	Phosphorus(5)	60.7
Arsenic(2)	0.0	Potassium(5)	541.0
Barium(5)	51.2	Rubidium(5)	2.6
Bromine(5)	8.6	Selenium(5)	1.4
Calcium(5)	1110.0	Silicon(5)	3,610.0
Chlorine(5)	2,310.0	Strontium(5)	14.6
Chromium(5)	5.5	Sulfur(5)	994.0
Cobalt(5)	8.5	Tin(5)	5.6
Copper(5)	24.4	Titanium(5)	116.0
Hexavalent Chromium	0.12	Uranium(5)	1.0
Iron(5)	1,250.0	Vanadium(5)	12.8
Lead(5)	12.5	Yttrium(5)	1.3
Manganese(5)	24.3	Zinc(5)	85.6
Mercury(5)	1.5	Zirconium(5)	5.1
Molybdenum(5)	2.3		

Source: CARB, ambient toxics air quality data for 1999 and 2000. The CARB notes that sampling periods shorter than 12 months are inappropriate for purposes of calculating annual averages.

(1) ppb/v = parts per billion by volume.

(2) No data available for 1999 and 2000 because fewer than 12 months of valid data.

(3) Data are the annual average for 2000 as the data for 1999 are based on fewer than 12 months of valid data.

(4) nanograms/m^3 = nanograms per cubic meter.

(5) Data are the annual average for 1999 as the data for 2000 are based on fewer than 12 months of valid data.

CARB has estimated cancer risk based on exposure to the carcinogens for which CARB recognizes a unit risk factor (see Table 3-5). The resulting estimated background cancer risk for the Long Beach area, based on CARB monitoring data is about 305 per million (see Table 3-5). This risk estimate may be expressed as the theoretical probability of 305 people contracting cancer out of an exposed population of one million people. However, the risk estimate should not be interpreted as the expected rate of disease in the exposed population, but rather as an estimate of potential risk, based on current scientific knowledge. The risk values are best used as a comparison of risks from different sources, rather than as a predictor of disease.

TABLE 3-5

**CANCER RISK BASED ON CARB
TOXIC AIR CONTAMINANTS – NORTH LONG BEACH 1999-2000 DATA**

SUBSTANCE	CANCER RISK (per million)
Acetaldehyde[(2)]	6.9
Arsenic	5.0
Benzene	80.3
Benzo(a)pyrene	0.2
Benzo(b)fluoranthene	0.02
Benzo(k)fluoranthene	0.009
1,3-Butadiene	110.5
Carbon Tetrachloride[(1)]	31.3
Chloroform	0.9
Chromium (VI)	19.0
Dibenz(a,h)anthracene	0.01
Dichlorobenzene	10.3
Formaldehyde[(2)]	27.1
Indeno(1,2,3-cd)pyrene	0.03
Lead	0.15
Methylene Chloride	2.4
Nickel	1.85
Perchloroethylene	8.4
Trichloroethylene	0.3
TOTAL	305

Source: Mike Redgrave, CARB. Average of CARB 1997 and 1998 toxic air contaminant monitoring data, for the North Long Beach Station unless otherwise noted.

(1) Based on 1998 data only as incomplete data were collected in 1997.

(2) Based on 1997 data only as incomplete data were collected in 1998.

In addition to CARB's monitoring, the SCAQMD measured TAC concentration as part of its Multiple Air Toxic Exposure Study, referred to as the MATES-II study. The purpose of the study is to provide a complete estimate of exposure to TACs of individuals within the South Coast Air Basin. The SCAQMD conducted air sampling at about 24 different sites for over 30 different toxic air contaminants between April 1998 and March 1999 (see Table 3-6). The SCAQMD has released a Final Report from this study, which indicates the following: (1) cancer risk levels appear to be decreasing since 1990 by about 44 percent to 63 percent; (2) mobile source components dominate the risk; (3) about 70 percent of all risk is attributed to diesel particulate emissions; (4) about 20 percent of all risk is attributed to other toxic emissions associated with mobile sources; (5) about 10 percent of all risk is attributed to stationary sources; and (6) no local "hot spots" have been identified.

Based on the results of the MATES-II study, the average cancer risk from TAC emissions in the Basin is about 1,400 per million people. This means that 1,400 people out of a million are susceptible to contracting cancer from exposure to the known TACs over a 70-year period. The cumulative risk averaged over the four counties (Los Angeles, Orange, Riverside, San Bernardino) of the South Coast Air Basin is about 980 per million when diesel sources are included and about 260 per million when diesel sources are excluded (SCAQMD, 2000c). The cancer risk from mobile sources (alone) was about 240 per million. The complete final report on the MATES-II study is available from the SCAQMD (SCAQMD, 2000h). Again, however, the risk values should not be interpreted as the expected rate of disease, but are best used as a tool for comparing risks from different sources.

Baseline Health Risk Assessment

TACs are emitted from the baseline Refinery processes. Air toxics include carcinogens and non-carcinogens that can cause health impacts to the exposed population through various pathways including inhalation and noninhalation pathways. The baseline TAC emissions are derived from the baseline using stream speciations (i.e., toxic contaminant content) appropriate to each product. The list of TACs considered in the HRA were those listed in the AB2588 Air Toxic Hot Spots Act and by the Office of Environmental Health Hazard Assessment. The emissions of TACs associated with the baseline Refinery operations are shown in Table 3-7.

Using the emission inventory in Table 3-8, the HRA was prepared to assess the individual excess cancer risk resulting from baseline Refinery operations at various locations surrounding the Refinery, including residential areas, commercial areas, other industrial areas, and sensitive population locations (e.g., schools and hospitals). The HRA determined the individual excess cancer risk at the maximum exposed individual worker (MEIW) and the maximum exposed individual resident (MEIR). The risk for the MEIW represents exposure to carcinogenic air toxics over a period of 46 years (assumes exposure for eight hours per day, 240 days per year for 46 years); the risk to the MEIR represents a continuous exposure over a period of 70 years.

TABLE 3-6

TOXIC COMPOUNDS MODELED AND MEASURED UNDER THE SCAQMD MATES II STUDY

TOXIC COMPOUND	Modeled Annual Average Concentration (ug/m^3)	Measured Annual Average Concentration (ug/m^3)
Benzene	3.13	3.53
1,3-Butadiene	0.34	0.79
p-Dichlorobenzene	0.24	0.92
Methylene chloride	1.08	2.65
Chloroform	0.08	0.24
Perchloroethylene	2.46	1.96
Trichloroethylene	0.26	0.43
Carbon tetrachloride	0.78	0.65
Ethylene dibromide	0.01	0.38
Ethylene dichloride	0.10	0.26
Vinyl chloride	0.01	0.26
Formaldehyde	5.49	4.82
Acetaldehyde	5.21	3.17
Acetone	2.78	5.00
Methyl ethyl ketone	1.72	1.06
Styrene	0.53	1.23
Toluene	12.17	12.98
1,1-Dichloroethane	0.03	0.20
Chloromethane	1.24	1.31
Arsenic	1.69	1.56
Elemental carbon	3.40	3.36
Organic carbon	5.92	6.43
Chromium	0.01441	0.00487
Hexavalent chromium	0.00024	0.00018
Cadmium	0.00193	0.00605
Lead (point sources)	0.00292	0.0197
Lead (area sources)	0.04808	0.0197
Nickel	0.00775	0.00872
Selenium	0.00160	0.00197

Source: SCAQMD, 2000h

TABLE 3-7

PARAMOUNT REFINERY
EMISSIONS OF INDIVIDUAL CHEMICALS

CHEMICAL	CAS NO.	Maximum Hourly Emissions (lbs/hr)	Annual Average Emissions (lbs/yr)
Acetaldehyde	75-07-0	1.713E-03	3.761E+01
Acrolein	107-02-8	4.537E-05	4.624E+00
Ammonia	7664-41-7	1.246E-01	1.092E+03
Arsenic	7440-38-2	4.571E-05	3.510E-01
Benzene	71-43-2	2.309E-01	2.105E+03
1,3-Butadiene	106-99-0	9.207E-05	1.060E+00
Cadmium	7440-43-9	1.297E-04	9.946E-01
Carbon Tetrachloride	56-23-5	2.135E-07	1.870E-03
Chlorine	7782-50-5	9.365E-06	8.204E-02
Chloroform	67-66-3	1.663E-07	1.457E-03
Chromium (Hexavalent)	18540-29-9	2.585E-05	1.984E-01
Copper	7440-50-8	4.082E-04	3.130E+00
Ethylbenzene	100-41-4	8.558E-03	9.499E+01
Ethylene Dibromide	106-93-4	2.579E-07	2.260E-03
Ethylene Dichloride	107-06-2	1.377E-07	1.206E-03
Formaldehyde	50-00-0	3.401E-02	6.832E+02
Hexane	110-54-3	9.051E-01	7.929E+03
Hydrochloric Acid	7647-01-0	6.151E-05	5.388E-01
Hydrogen Sulfide	7783-06-4	3.345E-04	2.565E+00
Lead	7439-92-1	2.738E-06	2.399E-02
Manganese	7439-96-5	8.785E-04	6.738E+00
Mercury	7439-97-6	6.521E-05	5.011E-01
Methanol	67-56-1	3.048E-05	2.670E-01
Methyl Ethyl Ketone (MEK)	78-93-3	1.365E-07	1.196E-03
Methyl Tert-Butyl Ether (MTBE)	1634-04-4	4.246E-05	3.720E-01
Methylene Chloride	75-09-2	1.163E-07	1.019E-03
Naphthalene	91-20-3	2.095E-03	1.698E+01
Nickel	7440-02-0	1.046E-04	8.043E-01
Perchloroethylene (PCE)	127-18-4	5.900E-03	4.900E+01
Phenol	108-95-2	3.345E-04	2.565E+00
PAHs	1-15-0	7.994E-04	7.526E+00
Propylene	115-07-1	2.556E-06	8.760E+01
Propylene Oxide	75-56-9	3.310E-09	2.899E-05
Selenium	7782-49-2	7.262E-07	6.361E-03
Styrene	100-42-5	3.091E-06	2.708E-02
Toluene	108-88-3	1.918E-01	1.754E+03
Vinyl Chloride	75-01-4	8.690E-08	7.613E-04
Xylenes	1330-20-7	3.133E-02	3.154E+02
Zinc	7440-66-6	2.014E-03	1.574E+01

For assessing the potential effects posed by TACs, the analysis focuses on the area that is subject to a lifetime cancer risk equal to or greater than one in one million. Figure 3-1 shows the 70-year exposure cancer risk isopleth of one in a million for the existing Refinery. Figure 3-2 shows the locations of the MEIW and MEIR. Based on the results of the HRA, the cancer risk associated with exposure to TAC emissions from the baseline Refinery operations for the MEIW and MEIR were estimated to be 2.82 x 10^{-6} (about three per million) and 14.9 x 10^{-6} (fifteen per million) respectively (see Table 3-8).

TABLE 3-8

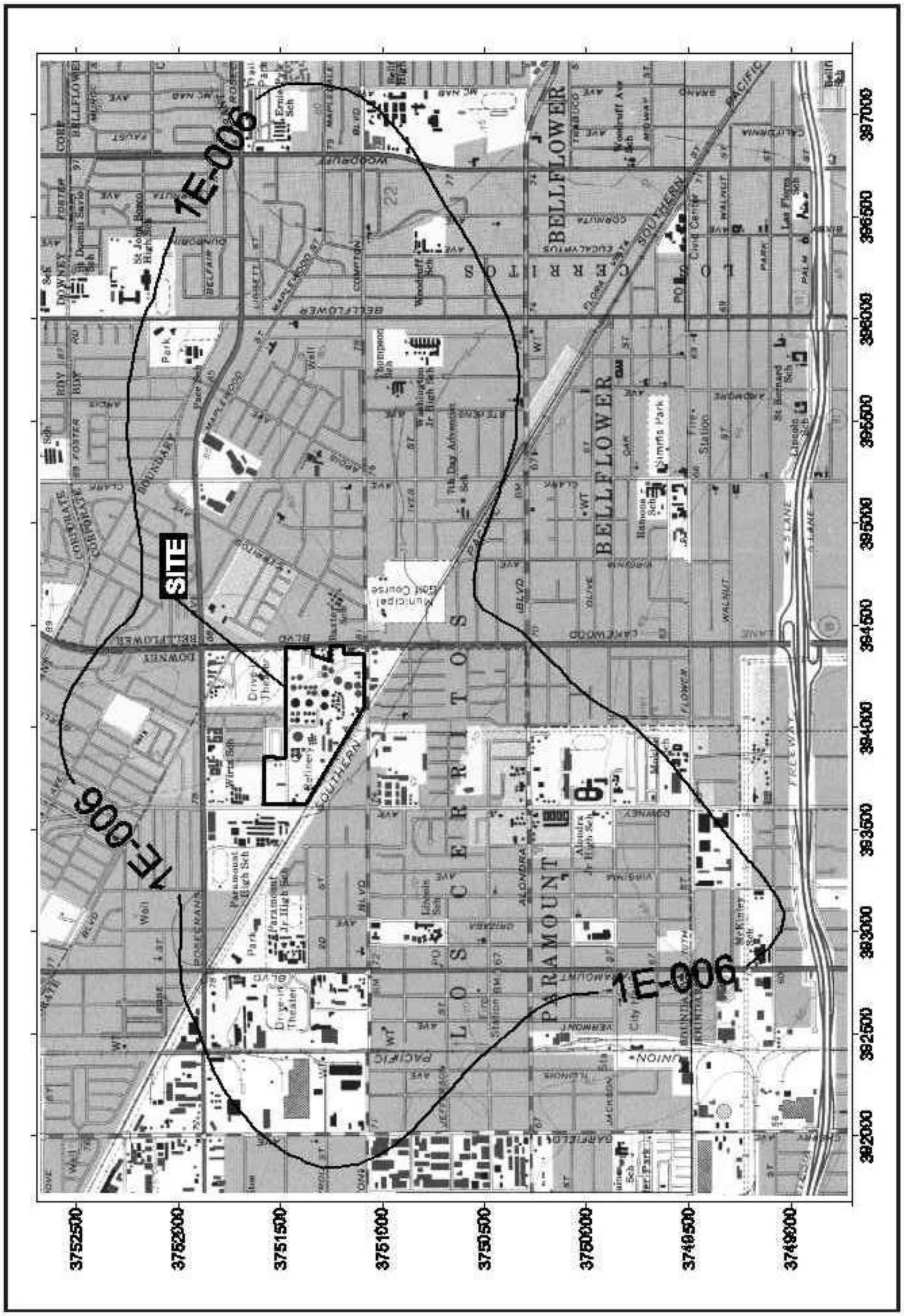
SUMMARY OF CANCER RISK

EXPOSURE PATHWAY	Maximum Exposed Individual Resident	Maximum Exposed Individual Worker
Inhalation	1.34E-05	2.49E-06
Dermal	1.46E-07	3.23E-08
Soil Ingestion	2.61E-07	5.70E-08
Water Ingestion	0.00E+00	0.00E+00
Ingestion of Home Grown Produce	1.11E-06	2.46E-07
Ingestion of Animal Products	0.00E+00	0.00E+00
Ingestion of Mother's Milk	0.00E+00	0.00E+00
Total Cancer Risk	**1.49E-05**	**2.82E-06**

The excess cancer burden was calculated using 2000 Census data for residential population, and Southern California Area Government data for worker population combined with predicted cancer risk at each census tract centroid. The total excess cancer burden is the sum of the product of the population and calculated cancer risk of the census tract within the one per million isopleth. The impact of the baseline emissions on the excess cancer burden is 0.146 and 0.0063 for the residential and occupational populations respectively. The total excess cancer burden is approximately 0.152 for residential and occupational populations combined.

The maximum cancer risk to a sensitive receptor was estimated to be 8.94E-06 or approximately nine per million at the Baxter Elementary School. This risk estimate is overly conservative as it is based on a seventy year continuous exposure period.

The HRA also included analysis of acute and chronic non-carcinogenic health impacts. The potential for acute/chronic health effects was evaluated by comparing the reference exposure levels (RELs) with the ground level concentrations developed by the ISCST3 model. The RELs represent the threshold for health effects. Exposure to contaminants at concentrations below the RELs is not expected to result in health effects. The acute/chronic RELs have been compared to the ground level concentration at the maximum impact point for each pollutant. The comparison of the acute/chronic RELs is used to estimate the total acute and chronic hazard indices for exposure to these pollutants. The total maximum acute and chronic hazard indices were

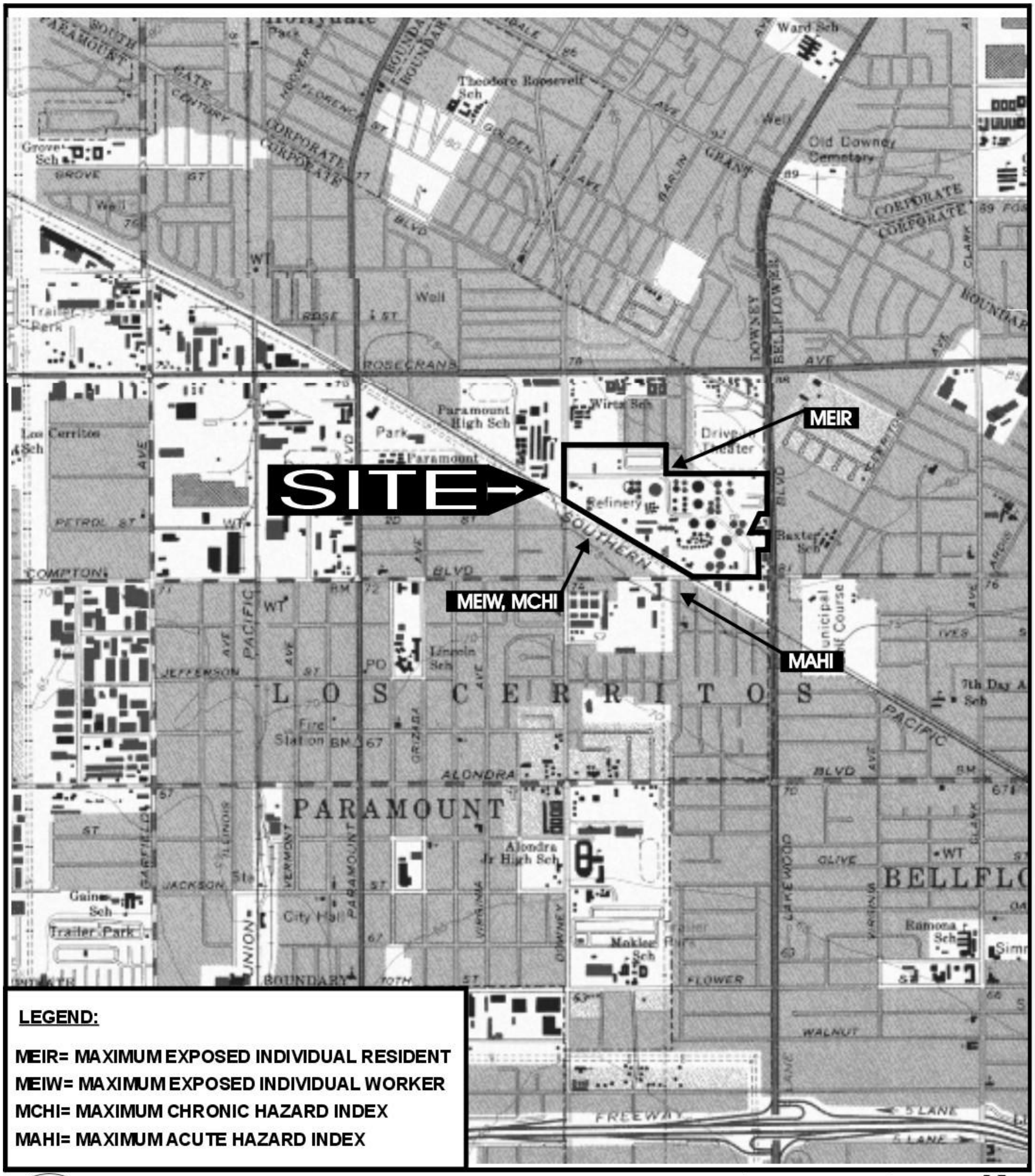


ONE IN A MILLION
BASELINE CANCER RISK ISOPLETH
PARAMOUNT PETROLEUM CORPORATION
PARAMOUNT, CALIFORNIA

Environmental Audit, Inc.

Project No. 2150

Figure 3-1



Environmental Audit, Inc.®

0 2500ft

N

BASELINE MAXIMUM IMPACT LOCATIONS
14700 Downey Avenue
Paramount, California

Figure 3-2

Project No. 2150
N:/2150/Baseline Max. Impact Loc.CDR

estimated to be 0.014 and 0.013, respectively. The maximum acute and chronic hazard indices locations are shown on Figure 3-2.

Regulatory Background

Ambient air quality standards in California are the responsibility of, and have been established by, both the U.S. EPA and CARB. These standards have been set at concentrations, which provide margins of safety for the protection of public health and welfare. Federal and state air quality standards are presented in Table 3-1. The SCAQMD has established levels of episode criteria and has indicated measures that must be initiated to immediately reduce contaminant emissions when these levels are reached or exceeded.
The federal, state, and local air quality regulations are identified below in further detail.

Federal Regulations: The U.S. EPA is responsible for setting and enforcing the National Ambient Air Quality Standards for oxidants (ozone), CO, NOx, SO_2, PM10, and lead. The U.S. EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

In 1990, the amendments to the federal CAA conditionally required states to implement programs in federal CO non-attainment areas to require gasoline to contain a minimum oxygen content in the winter beginning in November 1992. In response to the federal CAA requirements to reduce CO emissions, California established a wintertime oxygenate gasoline program requiring between 1.8 and 2.2 weight percent oxygen content in gasoline.

Other federal regulations applicable to the proposed project include Title III of the CAA, which regulates 189 toxic air contaminants. Standards for individual toxic air contaminants are being developed by the U.S. EPA under Title III of the CAA. Title V of the CAA establishes a federal permit program. Paramount has submitted its Title V permit application and the proposed project will require modifications to the Title V application and/or operating permit. The Title V program is implemented by the SCAQMD in the southern California area.

California Regulations: The CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act, responding to the federal CAA, and for regulating emissions from consumer products and motor vehicles. The CARB has established California Ambient Air Quality Standards for all pollutants for which the federal government has National Ambient Air Quality Standards and also has standards for sulfates, visibility, hydrogen sulfide and vinyl chloride. Hydrogen sulfide and vinyl chloride are not measured at any monitoring stations in the Basin because they are not considered to be a regional air quality problem. California standards are generally more stringent than the National Ambient Air Quality Standards. The CARB has established emission standards for vehicles sold in California and for various types of equipment. The CARB also sets fuel specifications to reduce vehicular emissions, although it has no direct regulatory approval authority over the proposed project. Federal and state air quality standards are presented in Table 3-1.

California gasoline specifications are governed by both state and federal agencies. During the past decade, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. Recent legislation in California (SB 521, The MTBE Public Health and Environmental Protection Act of 1997) directed the University of California to conduct a study of the health and environmental risks and benefits of MTBE in gasoline compared to other oxygenates, due to concerns raised by the use of MTBE. SB 521 also required the Governor to take appropriate action based on the findings of the report and information from public hearings.

In consideration of this study, public testimony, and other relevant information, California's Governor Davis found that, "on balance, there is significant risk to the environment from using MTBE in gasoline in California." In response to this finding, on March 25, 1999, the Governor issued Executive Order D-5-99 which directed, among other things, that California phase out the use of MTBE in gasoline. As part of the Executive Order, on December 9, 1999, CARB adopted the RFG Phase III requirements (see Table 2-2).

The California Clean Air Act (AB2595) mandates achievement of the maximum degree of emission reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date.

California also has established a state air toxics program (AB1807, Tanner) which was revised by the new Tanner Bill (AB2728). This program sets forth provisions to implement the national program for control of hazardous air pollutants.

The Air Toxic "Hot Spots" Information and Assessment Act (AB2588), and as amended by Senate Bill (SB) 1731, requires operators of certain stationary sources to inventory air toxic emissions from their operations and, if directed to do so by the local air district, prepare a health risk assessment to determine the potential health impacts of such emissions. If the health impacts are determined to be "significant" (greater than 10 per million exposures or non-cancer hazard index greater than 1.0), each facility must, upon approval of the health risk assessment, provide public notification to affected individuals.

Local Regulations: The Basin is under the jurisdiction of the SCAQMD which has regulatory authority over stationary source air pollution control and limited authority over mobile sources. The SCAQMD is responsible for air quality planning in the Basin and development of the Air Quality Management Plan (AQMP). The AQMP establishes the strategies that will be used to achieve compliance with national Ambient Air Quality Standards and California Ambient Air Quality Standards. The SCAQMD generally regulates stationary sources of air pollutants. There are a number of SCAQMD regulations that may apply to the proposed project including Regulation II – Permits, Regulation III – Fees, Regulation IV – Prohibitions, Regulation IX – New Source Performance Standards, Regulation X - National Emissions Standards for Hazardous Air Pollutants (NESHAPS) Regulations, Regulation XI – Source Specific Standards, Regulation XIII – New Source Review, Regulation XIV – New Source Review of Carcinogenic Air Contaminants (including Rule 1401, New Source Review of Toxic Air Contaminants and Rule 1403, Asbestos Emissions from Demolition/Renovation Activities), Regulation XVII – Prevention of Significant Deterioration, Regulation XX – Regional Clean Air Incentives Market (RECLAIM) Program, and Regulation XXX – Title V Permits.

B. HAZARDS AND HAZARDOUS MATERIALS

The Refinery handles hazardous materials with the potential to cause harm to people, property, or the environment. Accidental releases of hazardous materials at a facility can occur due to natural events, such as earthquake, and non-natural events, such as mechanical failure or human error. Potential consequences from the existing Refinery are those associated with accidental releases of toxic/flammable gas, toxic/flammable liquefied gas, and flammable liquids. Hazardous events associated with gas releases include toxic gas clouds, torch fires, and vapor cloud explosions. Hazardous events associated with potential releases of toxic/flammable liquefied gases include toxic clouds, torch fires, flash fires, and vapor cloud explosions. Releases of flammable liquids may result in pool fires, flash fires, and vapor cloud explosions. This section discusses existing hazards to the community from a release of hazardous materials at the existing Refinery, to provide a basis for evaluating the changes in hazards posed by the proposed project.

The Paramount Refinery currently uses a number of hazardous materials at the site to manufacture petroleum products. A more detailed discussion of the hazards associated with the existing Refinery is available in the Paramount Petroleum Risk Management Plan required under the federal Risk Management Program (RMP) and California Accidental Release Program (CalARP) regulations. Shipping, handling, storing, and disposing of hazardous materials inherently poses a risk of a release to the environment. The toxic substances handled by the refinery include hydrogen sulfide and ammonia, and regulated flammable substances including propane, butane, and other petroleum products including gasoline, fuel oils, diesel and other products, which pose a potential hazard in the event of a fire or explosion.

Types of On-Site Hazards

The potential consequences associated with Paramount's existing Refinery units are common to many petroleum facilities worldwide and are a function of the materials being processed, the processing systems and conditions, procedures used for operating and maintaining the facility, specific accidental release scenarios, and the hazard detection and mitigation systems. The consequences fall into the following categories.

Toxic Emissions from Gas Clouds: Gas clouds are releases of volatile chemicals that could form a cloud and migrate off-site, thus, exposing individuals. The Refinery produces an intermediate product known as hydrogen sulfide. Hydrogen sulfide is a toxic gas that can cause illness or fatality if inhaled in a sufficiently high concentration. If this material were accidentally released in large quantities the resulting gas cloud could migrate off-site, potentially exposing members of the public. Hydrogen sulfide is not stored at the Refinery but is created in the sulfur removal process. It is then immediately converted to elemental sulfur, a non-toxic liquid product, in the sulfur recovery process. “Worst-case” conditions tend to arise when very low wind speeds coincide with accidental release, which can allow the chemicals to accumulate rather than disperse. As a result, this type of accident is rare.

Thermal Radiation from torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases): The Refinery handles and stores large quantities of petroleum products that can burn if spilled or released under certain conditions. The heat generated by a fire is referred to as thermal radiation. Exposure to thermal radiation could result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the proximity of an individual to the fire.

Explosion/Overpressure: Explosions can occur when a gaseous or volatile flammable material is released and subjected to delayed ignition. When an explosion occurs, an atmospheric overpressure wave is generated. Depending on the intensity of the explosion, this overpressure wave can cause physical damage to certain types of structures and other property, and may also cause personal injury. The most common type of damage associated with industrial explosions is broken glass and the injury that may result. The specific conditions needed to create a strong explosion happen infrequently. As a result, this type of accident is rare.

Refinery Hazard Baseline: The EIR includes a hazard evaluation to determine the off-site consequences that could result from various accidental release scenarios that could occur during baseline Refinery operations (see Table 3-9), which represents the Refinery baseline for the hazard analysis for this EIR. See Appendix C for the detailed Hazards Analysis. In Chapter 4, these consequences are compared to scenarios that could occur after completion of the project to determine the proposed project impacts on hazards.

As shown in Table 3-9, several of the existing hazard scenarios could result in off-site impacts including potential releases from the reformer stabilizer overhead accumulator, the existing light naphtha stabilizer, the light naphtha Stabilizer Overhead Accumulator, butane and gasoline loading, and butane at gasoline blending.

Transportation Risks

A transportation accident involving the release of a hazardous substance could result in fire, explosion or other potentially harmful consequences depending on the nature of the released substance. In general, the greater the vehicle miles traveled, the greater the potential for an accident. Statistical accident frequency varies (especially for truck transport) and is related to the relative accident potential for the travel route since some freeways and streets are safer than others. The size of a potential release is related to the volume of hazardous materials being transported and the degree of damage to the vessel, e.g., rupture or leak. The potential consequences of the accident are related to the size of the release, the population density at the location of the accident, the specific release scenario, the physical and chemical properties of the hazardous material, and the local meteorological conditions.

TABLE 3-9

PARAMOUNT REFINERY
EXISTING REFINERY HAZARDS

	Release Form	Approximate Distance (ft) to Fenceline	Maximum Distance (ft) to LFL[(1)]	Maximum Distance (ft) to 30 ppm H_2S[(2)]	Offsite Hazard?
1	Reformer Stabilizer Overhead Accumulator	135	620	--	Yes
2	Existing Light Naphtha Stabilizer	220	655	--	Yes
3	Existing #1 HDS Stripper Overhead	245	75	50	No
4	Light Naphtha Stabilizer Overhead Accumulator	230	590	350	Yes
5	Butane Loading Hose	310	410	--	Yes
	Gasoline Loading Hose	75	180	--	Yes
6	Light Naphtha at Gasoline Blending	310	290	--	No
	Butane at Gasoline Blending	310	365	--	Yes
7	Reformer Stabilizer Offgas	140	60	--	No
	Reformer Produced Hydrogen	140	50	--	No

(1) LFL = the lower flammability limit. Hydrocarbon concentrations below this limit will not ignite
(2) H2S = hydrogen sulfide. The Emergency Response Planning Guideline Level 2 (ERPG-2) for H2S is 30 ppm.

The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, and driver training. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality and some accidents result in little or no property damage or personal injury. Additionally, not every truck accident result in an explosion or a release of hazardous substances.

Every time hazardous materials are moved from the site of generation, there is the potential for accidental release. A study conducted by the U.S. EPA indicates that the expected number of hazardous materials spills per mile shipped ranges from one in 100 million to one in one million, depending on the type of road and transport vehicle used. The U.S. EPA analyzed accident and traffic volume data from New Jersey, California, and Texas, using the Resource Conservation and Recovery Act Risk/Cost Analysis Model and calculated the accident rates presented in Table 3-10 (Los Angeles County, 1988).

TABLE 3-10

TRUCK ACCIDENT RATES FOR CARGO ON HIGHWAYS

HIGHWAY TYPE	ACCIDENTS PER 1,000,000 MILES
Interstate	0.13
U.S. and State Highways	0.45
Urban Roadways	0.73
Composite*	0.28

Source: U.S. Environmental Protection Agency, 1984.

* Average number for transport on interstates, highways, and urban roadways.

The accident rates developed based on transportation in California were used to predict the accident rate associated with trucks transporting materials to/from the Refinery. Table 3-11 estimates the accident rate for truck traffic assuming an average truck accident rate of 0.28 accidents per million miles travels (Los Angeles County, 1988). The estimated accident rate associated with the baseline Refinery is about 0.91 per year or about one accident every 1.1 year. The major portion of the truck traffic associated with the baseline Refinery operations is from the transport of asphalt which would not result in serious injury due to exposure, in the event of a release.

TABLE 3-11

PARAMOUNT PREDICTED TRUCK ACCIDENT RATES ASSOCIATED WITH THE CURRENT REFINERY OPERATIONS

Product	No. of Trips per Day(1)	Approx. Miles One Way	Estimated Accident Rate per Year(2)
Delivery/transport trucks:			
Liquified Petroleum Gas (LPG)(3)	3	90	0.028
Transportation Fuels(4)	17	30	0.052
Other (asphalt)	81	100	0.827
TOTALS:	**101**		**0.907**

(1) Number of truck trips that may involve the transport of hazardous materials. It is assumed that trucks that deliver or transport materials (e.g., petroleum products, ammonia trucks) would arrive carrying hazardous materials but would leave empty or vice versa (arrive empty and leave transporting materials).
(2) Reported accident rate for trucks is about 0.28 accidents per million miles traveled (Transportation Research Board, 1984). It should be noted that not every truck accident results in an explosion or release of hazardous substances.
(3) LPG is primarily used as refinery fuel.
(4) Transportation fuels include gasoline, jet fuel and diesel fuel.

The specific location and affected populations of an accidental release of a hazardous material associated with a traffic accident cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and residential areas into account.

The hazards associated with the transport of regulated hazardous materials would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Factors such as amount released, wind speed, ambient temperatures, route traveled, proximity to sensitive receptors are considered when determining the consequence of a hazardous material spill.

REGULATORY BACKGROUND

There are many federal and state rules and regulations that refineries and petroleum storage facilities must comply with which serve to minimize the potential impacts associated with hazards at these facilities. Under the Occupational Safety and Health Administration (OSHA) regulations [29 Code of Federal Regulations (CFR) Part 1910], facilities which use, store, manufacture, handle, process, or move highly hazardous materials must prepare a fire prevention plan. In addition, 29 CFR Part 1910.119, Process Safety Management (PSM) of Highly

Hazardous Chemicals, and Title 8 of the California Code of Regulations, General Industry Safety Order §5189, specify required prevention program elements to protect workers at facilities that have toxic, flammable, reactive or explosive materials. Prevention program elements are aimed at preventing or minimizing the consequences of catastrophic releases of the chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and an emergency response plan.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop Risk Management Programs (RMPs) to prevent accidental releases of these substances, U.S. EPA regulations are set forth in 40 CFR Part 68. In California, the California Accidental Release Prevention (CalARP) Program regulation (CCR Title 19, Division 2, Chapter 4.5) was issued by the Governor's Office of Emergency Services (OES). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program. RMPs for existing facilities were required to be submitted by June 21, 1999. The Los Angeles City Fire Department administers the CalARP program for the Refinery. Paramount is also required to comply with the U.S. EPA's Emergency Planning and Community Right-to-Know Act (EPCRA).

The Paramount Refinery has a Spill Prevention Containment and Countermeasures (SPCC) Plan per the requirements of 40 Code of Federal Regulations, Section 112. The SPCC is designed to prevent spills from on-site facilities and includes requirements for secondary containment, provides emergency response procedures, establishes training requirements, and so forth

The Hazardous Materials Transportation (HMT) Act is the federal legislation that regulates transportation of hazardous materials. The primary regulatory authorities are the U.S. Department of Transportation, the Federal Highway Administration, and the Federal Railroad Administration. The HMT Act requires that carriers report accidental releases of hazardous materials to the Department of Transportation at the earliest practical moment (49 CFR Subchapter C). Incidents which must be reported include deaths, injuries requiring hospitalization, and property damage exceeding $50,000. The California Department of Transportation (Caltrans) sets standards for trucks in California. The regulations are enforced by the California Highway Patrol.

California Assembly Bill 2185 requires local agencies to regulate the storage and handling of hazardous materials and requires development of a plan to mitigate the release of hazardous materials. Businesses that handle any of the specified hazardous materials must submit to government agencies (i.e., fire departments), an inventory of the hazardous materials, an emergency response plan, and an employee training program. The business plans must provide a description of the types of hazardous materials/waste on-site and the location of these materials. The information in the business plan can then be used in the event of an emergency to determine the appropriate response action, the need for public notification, and the need for evacuation.

C. TRANSPORTATION/TRAFFIC

Regional Circulation

The project site is bounded by Lakewood Boulevard to the east, Somerset Boulevard to the south, the Department of Water and Power easement and the UPRR railroad tracks to the southwest, and Downey Avenue to the west. Trucks enter the Paramount refinery via Andry Drive, an L-shaped street with access to Lakewood Boulevard and Somerset Boulevard. Regional access to the site is provided by the Rosecrans Avenue, Lakewood Boulevard, and Alondra Boulevard offramps of the San Gabriel River (I-605) and Long Beach (I-710) freeways, the Lakewood Boulevard exits of the Artesia (SR-91) Freeway, and the Lakewood Boulevard exits of the Century (I-105) Freeway.

Local Circulation

The Paramount Refinery is located at 14700 Downey Avenue, Paramount, California, approximately three-quarters of a mile south of Interstate 105. The refinery currently employs about 180 full-time employees and contractors. The existing roadway conditions for vehicular access to and from the project site are summarized below.

Lakewood Boulevard: Lakewood Boulevard has a north-south alignment and runs parallel to the eastern border of the project site. This four-lane roadway, divided by a raised median along the project frontage, is 90 feet wide. The median is 18 feet in width with 36 feet of travel width on each side. Parking is currently allowed on both sides of the street. The General Plan designates Lakewood Boulevard as a truck route.

Somerset Boulevard: Somerset Boulevard has an east-west alignment and provides access to commercial activities and residential developments through the cities of Compton, Paramount and Bellflower. This four-lane roadway is divided by a raised median along the project frontage, and is approximately 90 feet wide. The median is approximately 14 feet wide with 36 feet of travel width in each direction. Parking is permitted on both sides of the street. The Union Pacific Railroad tracks cross Somerset Boulevard and Downey Avenue and continue further northwest towards the industrial heart of Los Angeles. It also forms the southwestern border of the Paramount Refinery and the Somerset Village condominiums.

Downey Avenue: Downey Avenue has a north-south alignment and provides commercial and residential access through the cities of Downey, Paramount, and Long Beach. The Paramount refinery's western boundary is between the UPRR tracks and Contreras Street, opposite Paramount High School. Downey Avenue is classified as a secondary arterial by the City of Paramount. The roadway is approximately 70 feet wide, with a 14-foot median. Parking is allowed on both sides of the street.

Andry Drive: Andry Drive (a private road owned by Paramount Petroleum) is an L-shaped private street providing access to Paramount refinery from Lakewood and Somerset Boulevards. Andry Drive is an undivided street with one lane in each direction. Both left and right turns from

Andry Drive onto Somerset Boulevard are permitted. Lakewood Boulevard permits only right turns from Andry Drive. Trucks queue in parking stalls along Andry Drive before entering the refinery. Refinery personnel monitor the truck entrance to the site.

Employee and visitor access to the Paramount refinery is from the main driveway entrance at Downey Avenue. The driveway is a two-lane roadway with one entrance lane and one exit lane. The site entrance is gated and video monitored.

The operating characteristics of an intersection are defined in terms of the level of service (LOS), which describes the quality of traffic flow based on variations in traffic volume and other variables such as the number of signal phases. Intersections with LOS A to C operate well with no traffic delays. LOS C normally is taken as the design level for intersections in urban areas outside a regional core. LOS D typically is the level for which a metropolitan area street system is designed. LOS E represents intersection volumes at or near the capacity of the highway that will result in possible stoppages of momentary duration and fairly unstable traffic flow. LOS F occurs when an intersection or street is overloaded and is characterized by stop-and-go (forced flow) traffic with stoppages of long duration.

Traffic counts, including turn counts, were taken during April 2003 to determine the existing traffic in the vicinity of the Paramount Refinery. Peak hour LOS analyses were developed for intersections in the vicinity of the Refinery (see Table 3-12). The LOS for the intersections in the area are mostly A and B during the a.m. peak period, indicating relatively free flowing traffic conditions. During the p.m. peak period, the LOS are B, C and D. The LOS analysis indicates typical urban traffic conditions in the area surrounding the Paramount Refinery. Ten out of the eleven intersections which were analyzed during the morning peak hour, operated at LOS A. The intersection at Downey Avenue and SR91 westbound off and on ramps, and SR91 eastbound off ramp, operated at LOS B. During the evening peak hour, three intersections operated at LOS B, six at LOS C and two at LOS D.

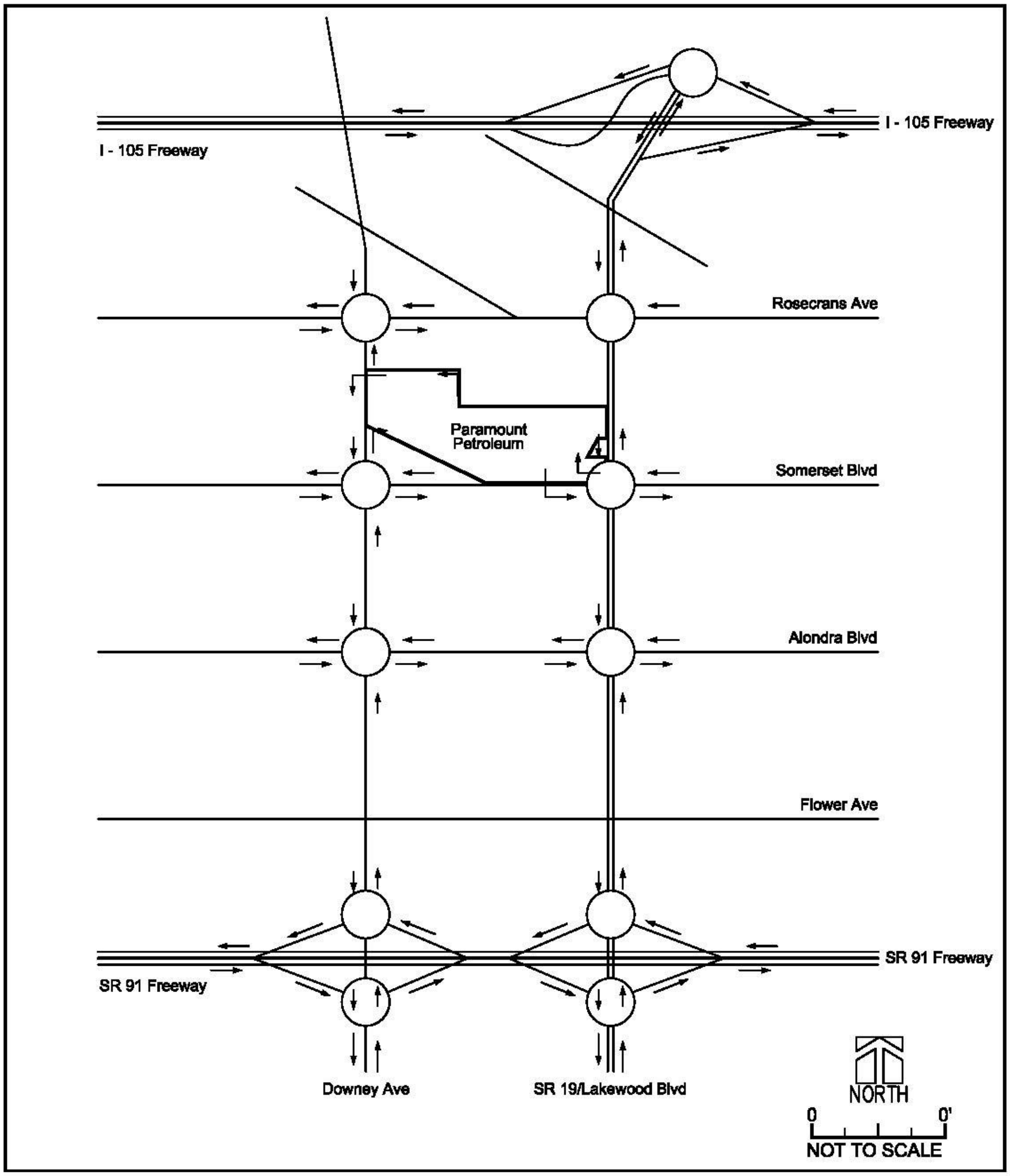
TABLE 3-12

PARAMOUNT REFINERY

EXISTING LEVEL OF SERVICE ANALYSIS AND VOLUME-TO-CAPACITY-RATIOS

	BASELINE(1) IMPACTS			
	AM PEAK		PM PEAK	
INTERSECTION	Level of Service	Volume to Capacity Ratio	Level of Service	Volume to Capacity Ratio
Downey Ave. & Rosecrans Ave.	B	0.662	C	0.761
Downey Ave. & Somerset Blvd.	D	0.854	B	0.687
Downey Ave. & Alondra Blvd.	B	0.637	C	0.793
Downey Ave. & SR91 WB offramp/ SR91 WB on & EB offramps.	C	0.780	B	0.625
Downey Ave. & SR91 EB onramp/ SR91 EB offramp.	B	0.661	B	0.662
Lakewood Blvd. & I105 EB offramp/ I105 WB offramp.	A	0.560	C	0.749
Lakewood Blvd. & Rosecrans Ave.	A	0.562	C	0.745
Lakewood Blvd. & Somerset Blvd.	A	0.598	B	0.671
Lakewood Blvd.& Alondra Blvd.	A	0.540	C	0.750
Lakewood Blvd & SR91 WB on/off ramps SR91 WB onramp.	A	0.418	A	0.586
Lakewood Blvd & SR91 EB onramp SR91 EB on/off ramps.	A	0.520	B	0.691

Note: (1) Based on Year 2003 traffic counts.
Note: (2) No increase is forecasted since project will be completed in less than a year.



ENVIRONMENTAL AUDIT, INC.®

LOCAL TRAFFIC MAP

Project No. 2150 Figure 3-3

I:\2150\Local Traffic Map

M:\DBS\2150 Paramount\Electronic EIR\Paramount CFP EIR 3.doc