# CHAPTER 3
# ENVIRONMENTAL SETTING

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# 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 Refinery that could be adversely affected by the proposed project. Information regarding the environmental setting has been developed in this ~~Draft~~ Final EIR.

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 determined to have no potential adverse impact from the proposed project, as determined by the Initial Study (see Appendix A).

## A. AIR QUALITY

### Meteorological Conditions

The proposed project site is located within the Basin which consists 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. v

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:** 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 are responsible for a large portion of the total Basin emissions of several pollutants.

Mobile source account for approximately 63 percent of VOC emissions, 90 percent of the NOx emissions, 57 percent of the sulfur dioxide (SOx) emissions, 97 percent of the carbon monoxide (CO) emissions, and 14 percent of the particulate matter less than ten microns (PM10) emissions in the Basin (SCAQMD, 2003a).

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.

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 designated as non-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 $NO_2$, $SO_2$, sulfates, and lead.

## TABLE 3-1

## AMBIENT AIR QUALITY STANDARDS

| POLLUTANT | NATIONAL STANDARDS | STATE STANDARDS |
|---|---|---|
| Ozone | | |
| 8-hour | 0.08 ppm(1) | None |
| 1-hour (federal) | 0.12 ppm | 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<br>8-hour (10 am to 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

**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 at 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, 2003a). 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, 2003a).

**Local Air Quality:** The project site is located within the SCAQMD's South Coastal Los Angeles County monitoring area. Recent background air quality data for criteria pollutants for the South Coast Los Angeles County monitoring station are presented in Table 3-2. The area has shown a general improvement in air quality with decreasing or consistent concentrations of most pollutants (see Table 3-2). Air quality in the South Coast Los Angeles County monitoring area complies with the state and federal ambient air quality standards for CO, NOx, SOx, lead, and sulfate. The air quality in the area also is in compliance with the federal eight-hour ozone standard, and the 24-hour and annual PM10 standard. The air quality in the South Coast Los Angeles County area is not in compliance with the state and federal one-hour average ozone standard and the 24-hour PM10 and PM2.5 standards.

### Refinery Criteria Pollutant Emissions

Operation of the existing Refinery results in the emissions of criteria pollutants. The reported emissions of criteria air pollutants from the Refinery for the last two-year period is are shown in Table 3-3.

## TABLE 3-2

### AMBIENT AIR QUALITY
### SOUTH COASTAL LOS ANGELES COUNTY MONITORING STATION (1998-2002)
### Maximum Observed Concentrations

| CONSTITUENT | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|
| Ozone: 1-hour (ppm) | 0.12 | 0.13 | 0.12 | 0.091 | 0.084 |
| Federal Standard | (0) | (1) | (0) | (0) | (0) |
| State Standard | (2) | (3) | (3) | (0) | (0) |
| 8-hour (ppm) | 0.08 | 0.08 | 0.08 | 0.07 | 0.065 |
| | (0) | (0) | (0) | (0) | (0) |
| Carbon Monoxide: | | | | | |
| 1-hour (ppm) | 8.0 | 7.0 | 10.0 | 6.0 | 6.0 |
| | (0) | (0) | (0) | (--) | (0) |
| 8-hour (ppm) | 6.6 | 5.4 | 5.8 | 4.71 | 4.6 |
| | (0) | (0) | (0) | (0) | (0) |
| Nitrogen Dioxide: | | | | | |
| 1-hour (ppm) | 0.16 | 0.15 | 0.14 | 0.13 | 0.13 |
| | (0) | (0) | (0) | (--) | (0) |
| Annual (ppm) | 0.0339 | 0.0342 | 0.0313 | 0.0308 | 0.0298 |
| PM10: | | | | | |
| 24-hour (ug/m$^3$) | 69 | 79 | 105 | 91 | 74 |
| Federal standard | (0) | (0) | (0) | (0) | (0) |
| State standard | (10.2%) | (13%) | (21%) | (17%) | (8.6%) |
| Annual (ug/m$^3$) | | | | | |
| Geometric | 29.2 | 38.9 | 34.0 | 34.8 | 34.1 |
| Arithmetic | 32.3 | 36.4 | 37.6 | 37.4 | 35.9 |
| PM2.5: | | | | | |
| 24-hour (ug/m$^3$) | -- | 66.9 | 81.5 | 72.9 | 62.7 |
| Federal standard | -- | (1%) | (1.3%) | (0.3%) | (0%) |
| Annual Arithmetic Mean | -- | 21.5 | 19.2 | 21.4 | 19.5 |
| Sulfur Dioxide: | | | | | |
| 1-hour (ppm) | 0.08 | 0.05 | 0.05 | 0.05 | 0.03 |
| | (0) | (0) | (0) | (0) | (0) |
| 24-hour (ppm) | 0.013 | 0.011 | 0.014 | 0.012 | 0.008 |
| | (0) | (0) | (0) | (0) | (0) |
| Annual (ppm) | -- | 0.0027 | 0.0015 | 0.00xx | 0.00xx |
| Lead: | | | | | |
| 30-day (ug/m$^3$) | 0.07 | 0.06 | 0.05 | 0.05 | 0.03 |
| | (0) | (0) | (0) | (0) | (0 |
| Quarter (ug/m$^3$) | 0.04 | 0.05 | 0.04 | 0.04 | 0.02 |
| | (0) | (0) | (0) | (0) | (0) |
| Sulfate: | | | | | |
| 24-hour (ug/m$^3$) | 14.5 | 13.7 | 26.7 | 15.9 | 15.2 |
| | (0%*) | (0%) | 1** | (0%) | (0%) |

Source: SCAQMD Air Quality Data Annual Summaries 1996-2000.

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, * = Less than 12 full months of data, so data may not be representative. ** = 1 day exceeded 24 hour state standard.

**TABLE 3-3**

**REFINERY BASELINE**
**CRITERIA POLLUTANT EMISSIONS**
**(tons/year)**

| REPORTING PERIOD | CO | VOC | NOx | SOx | PM10 |
|---|---|---|---|---|---|
| 2001-2002 | 145 | 121 | 253 | 781 | 211 |
| 2002-2003 | 152 | 173 | 268 | 682 | 153 |
| Average Baseline Emissions(1) | 149 | 147 | 261 | 732 | 182 |

(1) Baseline emissions are based on the annual emission fee reports prepared for the SCAQMD during the July 2001 through June 2002 and July 2002 through June 2003 reporting period.

**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 TAC program (Assembly Bill 1807, Health and Safety Code §39650 et seq.), the CARB, with the participation of the local air pollution control districts, evaluates and develops any needed control measures for air toxics. The general goal of regulatory agencies is to limit exposure to TACs to the maximum extent feasible.

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 TACs every 12 days at approximately 20 sites throughout California (CARB, Mike Redgrave, personal communication). The Refinery is located closest to the North Long Beach station. A summary of the averaged data from 1999-2001 monitoring from the Long Beach station for various TACs is considered to be an appropriate estimate of the TAC concentration in the Long Beach area (see Table 3-4).

## TABLE 3-4

### AMBIENT AIR QUALITY
### TOXIC AIR CONTAMINANTS – NORTH LONG BEACH
### 2000-2001

| POLLUTANT | ANNUAL AVERAGE | POLLUTANT | ANNUAL AVERAGE |
|---|---|---|---|
| VOC's | ppb/v(1) | | ppb/v |
| Acetaldehyde | 2.7 | Methyl Ethyl Ketone | 2.35 |
| Benzene | 1.05 | Methyl Tertiary Butyl Ether | 5.75 |
| 1,3-Butadiene | 0.85 | Methylene Chloride | 2.3 |
| Carbon Tetrachloride | 0.12 | Perchloroethylene | 0.5 |
| Chloroform | 0.04 | Styrene | 1.15 |
| o-Dichlorobenzene | 0.25 | Toluene | 2.3 |
| p-Dichlorobenzene | 0.3 | Trichloroethylene | 0.07 |
| Ethyl Benzene | 0.75 | meta-Xylene | 4.3 |
| Formaldehyde | 7.3 | ortho-xylene | 1.25 |
| Methyl Chloroform | 0.13 | | |
| PAH's | nanograms/m(2) | | nanograms/$m^3$ |
| Benzo(a)pyrene | 0.89 | Benzo(k)fluoranthene | 0.39 |
| Benzo(b)fluoranthene | 0.97 | Dibenz(a,h)anthracene | 0.13 |
| Benzo(g,h,i)perylene | 2.5 | Indeno(1,2,3-cd)pyrene | 1.45 |
| Inorganic Compounds | nanograms/m(2) | | nanograms/$m^3$ |
| Aluminum | 4,100.0 | Nickel | 15.0 |
| Antimony | 14.0 | Phosphorus | 172.0 |
| Arsenic | 0.0 | Potassium | 2,810.0 |
| Barium | 285.0 | Rubidium | 7.5 |
| Bromine | 33.5 | Selenium | 3.5 |
| Calcium | 3,200.0 | Silicon | 10,350.0 |
| Chlorine | 3,700.0 | Strontium | 52.5 |
| Chromium | 27.5 | Sulfur | 3,000.0 |
| Cobalt | 8.0 | Tin | 26.0 |
| Copper | 99.5 | Titanium | 360.0 |
| Hexavalent Chromium | 0.45 | Uranium | 2.0 |
| Iron | 3,750.0 | Vanadium | 42.0 |
| Lead | 107.0 | Yttrium | 2.5 |
| Manganese | 73.0 | Zinc | 230.0 |
| Mercury | 2.75 | Zirconium | 18.5 |
| Molybdenum | 5.5 | | |

Source: CARB, ambient toxics air quality data for 2000 and 2001.

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

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

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 to individuals within the Basin. The SCAQMD conducted air sampling at about 24 different sites for over 30 different TACs between April 1998 and March 1999. 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) approximately 70 percent of all risk is attributed to diesel particulate emissions; (4) about 20 percent of all risk is attributed to other toxics 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. The average carcinogenic risk 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 of time. The cumulative risk averaged over the four counties (Los Angeles, Orange, Riverside, San Bernardino) of the Basin is about 980 in one million when diesel sources are included and about 260 in one million when diesel sources are excluded. Of the ten monitoring sites in the MATES II study, Wilmington is the closest site to the Refinery. The cancer risk at the Wilmington site, based on monitoring data, was about 380 per million from stationary and mobile sources. 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, 2000).

CARB has estimated cancer risk based on exposure to the background concentrations of TACs in the Long Beach area (see Table 3-4). The CARB provides cancer risk estimates for carcinogens for which CARB recognizes a unit risk factor. A unit risk factor is needed to calculate cancer risk. The estimated background cancer risk at the Long Beach monitoring station, based on CARB monitoring data is about 288 per million (see Table 3-5).

The CARB completed air monitoring between May 2001 and July 2002, at Wilmington Park Elementary school because of the location of the school in proximity to refiners and the ports (CARB, 2003). Monitoring was completed for over 50 air pollutants. The key findings of the study were the following: (1) the air quality around the Wilmington Park Elementary school is similar to other parts of the Los Angeles urban area; (2) the estimated cancer risk in Wilmington was 278 per million as compared to Long Beach with a cancer risk of 279 per million and downtown Los Angeles at 341 per million; (3) local meteorology patterns in Wilmington appear to favor dispersion of local air pollution; and (4) PM10 levels measured in Wilmington were noticeably higher than in nearby Long Beach (CARB, 2003).

**Refinery Baseline Health Risk Assessment**

TACs are emitted from the existing Refinery. 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 current TAC emissions from the Refinery were recently quantified in an Air Toxics Inventory Report (ATIR) prepared for and submitted to the SCAQMD (September, 2000) to comply with the deadlines imposed under SCAQMD Rule 1402 – Control of Toxic Air Contaminants from Existing Sources. At SCAQMD's request, the Refinery's Health Risk Assessment (HRA), last done in 1991, was updated using the ATIR (September, 2000 which was based on 1999 Refinery emissions) and submitted to the SCAQMD (October, 2000). The most recently prepared HRA (October, 2000) will be used to describe the environmental setting associated with TACs emitted from the Refinery. More details of the

HRA are provided in Volume II of this EIR. The list of TACs considered in the HRA were those listed in the AB2588 Air Toxics Hot Spots Act and by the Office of Environmental Health Hazard Assessment (OEHHA). The emissions of TACs associated with the existing operations at the Refinery are shown in Table 3-6.

**TABLE 3-5**

**CANCER RISK BASED ON CARB NORTH LONG BEACH MONITORING STATION DATA**

| SUBSTANCE | CANCER RISK (per million) |
|---|---|
| Acetaldehyde | 5.5 |
| Benzene(1) | 92 |
| Benzo(a)pyrene | 0.1 |
| Benzo(b)fluoranthene | 0.02 |
| Benzo(k)fluoranthene | 0.007 |
| 1,3-Butadiene(1) | 104 |
| Carbon Tetrachloride(1) | 26 |
| Chloroform(1) | 1 |
| Chromium (VI)(1) | 18 |
| Dibenz(a,h)anthracene | 0.01 |
| Dichlorobenzene(1) | 8 |
| Formaldehyde | 21.5 |
| Indeno(1,2,3-cd)pyrene | 0.02 |
| Lead(2) | 0.1 |
| Methylene Chloride(1) | 2 |
| Nickel(2) | 2 |
| Perchloroethylene(1) | 7 |
| Trichloroethylene(1) | 0.3 |
| **TOTAL** | **288** |

Source: Average of CARB 2000 and 2001 toxic air contaminant monitoring data, unless otherwise noted.
(1) Based on 2000 data only as incomplete data were collected in 2001.
(2) Based on 2001 data only as incomplete data were collected in 2000.

## TABLE 3-6
## EMISSIONS OF INDIVIDUAL TOXIC AIR CONTAMINANTS FROM EXISTING OPERATIONS AT THE ULTRAMAR INC. -VALERO WILMINGTON REFINERY

| CHEMICAL | CAS No. | Emissions (lbs/hr) | Emissions (lbs/yr) |
|---|---|---|---|
| Acetaldehyde | 75-07-0 | 8.70E-01 | 5.93E+03 |
| Acrolein | 107-02-8 | 3.57E-03 | 1.70E-01 |
| Ammonia | 7664-41-7 | 9.10E+00 | 6.81E+04 |
| Aniline | 62-53-3 | 1.04E-02 | 9.11E+01 |
| Arsenic | 7440-38-2 | 1.15E-03 | 5.00E+00 |
| Benzene | 71-43-2 | 1.60E-01 | 9.73E+02 |
| Beryllium | 7440-41-7 | 1.78E-05 | 1.11E-01 |
| Butadiene-1,3 | 106-99-0 | 2.41E-02 | 1.08E+01 |
| Cadmium | 7440-43-9 | 7.93E-04 | 1.41E+00 |
| Carbon disulfide | 75-15-0 | 2.11E+00 | 1.57E+04 |
| Chlorobenzene | 108-90-7 | 2.79E-01 | 4.47E+01 |
| Chromium (hex.) | 18540-29-9 | 2.99E-04 | 2.14E+00 |
| Copper | 7440-50-8 | 3.17E-03 | 8.42E+00 |
| Cresols | 1319-77-3 | 1.78E-02 | 1.55E+02 |
| Dibromo3chloropropane | 96-12-8 | 7.22E-08 | 6.32E-04 |
| Ethyl Benzene | 100-41-4 | 5.68E-02 | 4.77E+02 |
| Formaldehyde | 50-00-0 | 4.78E-01 | 2.18E+03 |
| Hexane | 110-54-3 | 2.94E-01 | 2.55E+03 |
| Hydrochloric acid | 7647-01-0 | 1.96E-02 | 9.33E-01 |
| Hydrogen cyanide | 74-90-8 | 5.75E-01 | 3.35E+03 |
| Hydrogen fluoride | 7664-39-3 | 9.68E-03 | 8.48E+01 |
| Hydrogen sulfide | 7783-06-4 | 1.21E+00 | 9.14E+03 |
| Lead | 7439-92-1 | 3.12E-03 | 8.93E+00 |
| Manganese | 7439-96-5 | 4.50E-03 | 1.93E+01 |
| Mercury | 7439-97-6 | 8.27E-04 | 4.63E+00 |
| Methyl chloroform | 71-55-6 | 5.38E-03 | 4.71E+01 |
| Methyl Ethyl Ketone | 78-93-3 | 8.78E-04 | 5.83E+00 |
| Methyl methacrylate | 80-62-6 | 3.88E-05 | 3.40E-01 |
| Methyl t-Butyl Ether | 1634-04-4 | 1.02E-01 | 8.87E+02 |
| Naphthalene | 91-20-3 | 1.96E-02 | 1.51E+02 |
| Nickel | 7440-02-0 | 8.54E-03 | 3.66E+01 |
| Perchloroethylene | 127-18-4 | 3.24E-03 | 2.84E+01 |
| Phenol | 108-95-2 | 3.12E-01 | 1.86E+03 |
| Polycyclic arom. HC | 1-15-0 | 4.20E-03 | 3.64E+00 |
| Propylene | 115-07-1 | 1.16E-01 | 5.71E+02 |
| Selenium | 7782-49-2 | 6.23E-04 | 2.98E+00 |
| Styrene | 100-42-5 | 2.71E-03 | 2.38E+01 |
| Tetrachloroethane | 79-34-5 | 1.04E-07 | 7.61E-05 |
| Toluene | 108-88-3 | 4.04E-01 | 2.70E+03 |
| Xylene | 1-21-0 | 4.30E-01 | 2.94E+03 |
| Zinc | 7440-66-6 | 6.64E-02 | 2.38E+02 |

CAS No. = Chemical Abstract Service Number

(1) Emissions were calculated; however, health data do not exist for these compounds. Therefore,

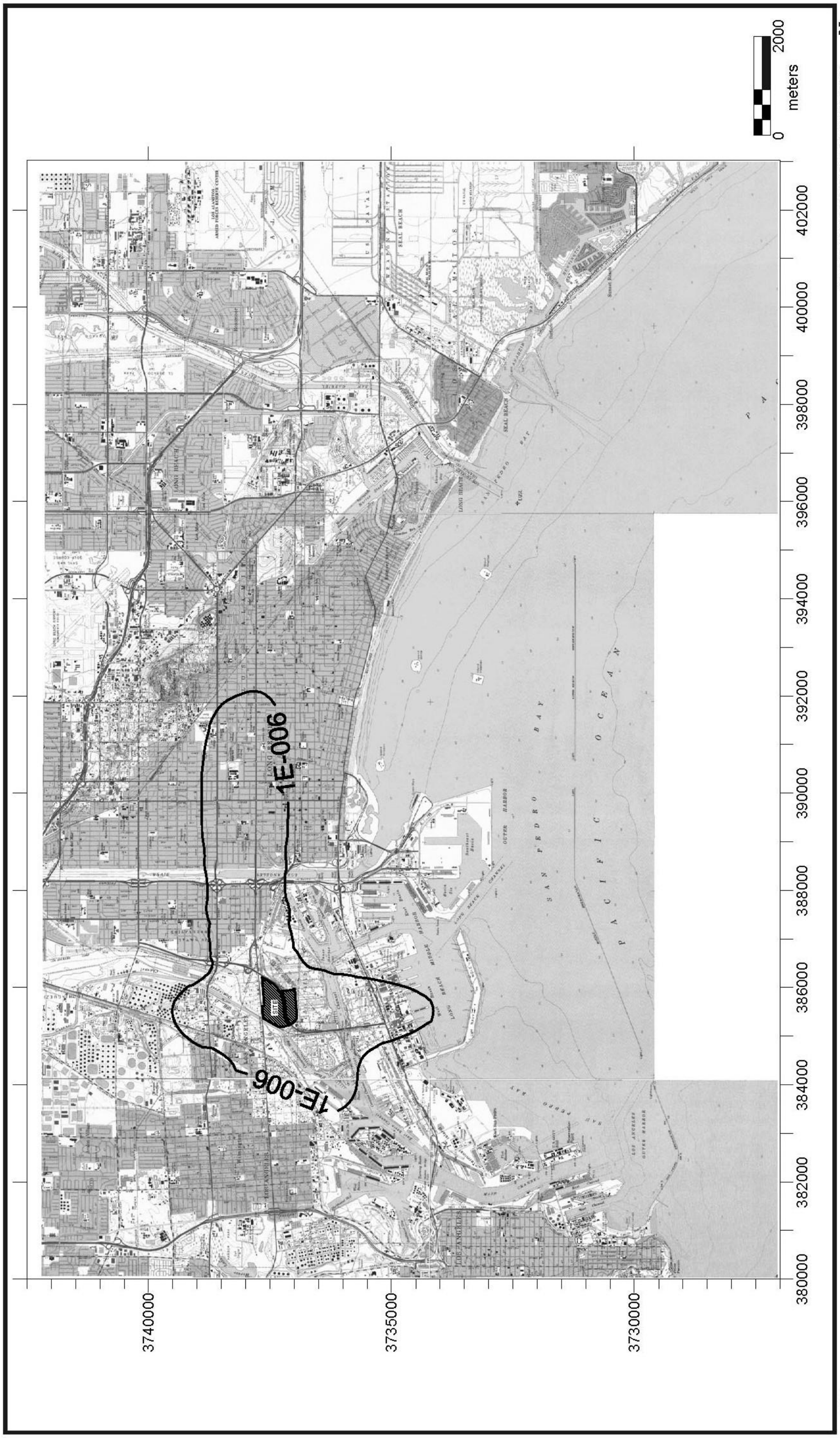
Using the emission inventory in Table 3-6, the HRA was prepared to assess the individual excess cancer risk at various locations surrounding the Refinery, including residential areas, commercial areas, other industrial areas, and sensitive population locations (e.g., schools and hospitals). The HRA identified 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.

For assessing the potential effects posed by existing TAC emissions, 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 existing MEIW and MEIR. Based on the results of the HRA, the cancer risk associated with exposure to TAC emissions from the existing Refinery operations for the MEIW and MEIR were estimated to be $1.03 \times 10^{-6}$ (about one per million) and $2.49 \times 10^{-6}$ (about 2.5 per million), respectively (see Table 3-7).

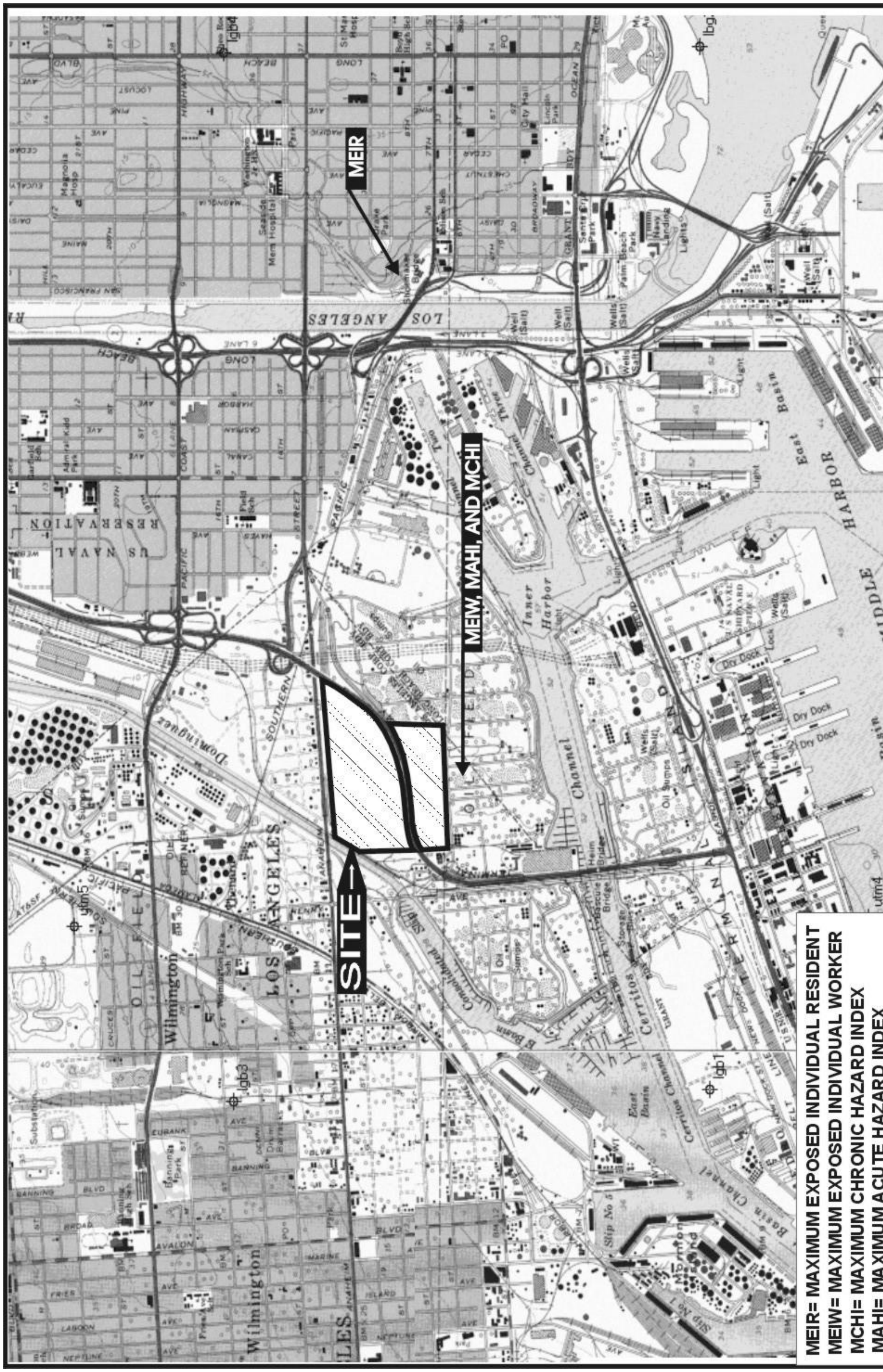
Existing cancer risk calculations also were provided for a number of sensitive populations near the Refinery including schools, daycare centers, hospitals, and retirement homes. The existing peak risk at a sensitive population was estimated to be $2.16 \times 10^{-6}$ or approximately two per million at the Edison School. This risk estimate is conservative as it is based on a 70-year continuous exposure.

Using the one per million isopleth from the coarse grid ACE1588 modeling as a study area, cancer risk levels at the census tract centroids with their respective populations contained within the one per million isopleth were developed. The excess cancer burden for each centroid was calculated by multiplying the predicted 70-year lifetime risk at each centroid with the population within the census tract. The total excess cancer burden is computed as the sum of cancer burden for each census tract. The total excess cancer burden within the area of influence was predicted to be 0.199 and 0.01 for the residential and occupational populations, respectively.

The HRA also included analyses of existing acute and chronic non-carcinogenic health impacts. The potential for chronic/acute 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 chronic/acute 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 existing total maximum acute and chronic hazard indices were estimated to be 0.795 and 0.071, respectively.



BASELINE ONE PER MILLION CANCER RISK ISOPLETH
ULTRAMAR INC. -
VALERO WILMINGTON REFINERY
1E-006
SITE
0
meters
2000
N
Figure 3-1
SOURCE: USGS TOPOGRAPHIC 7.5 MINUTE SERIES
TORRANCE, LONG BEACH, LOS ALAMITOS, CA
Environmental Audit, Inc.
Project No. 2185
3740000
3735000
3730000
380000
382000
384000
386000
388000
390000
392000
394000
396000
398000
400000
402000




SOURCE: U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, LONG BEACH AND TORRANCE, CA

SITE LOCATION & MAXIMUM IMPACT MAP
ULTRAMAR INC. -
VALERO WILMINGTON REFINERY

Figure 3-2

Project No. 2185
N:\2185\Site Loc. & Max. Impact Map (Fig 3-2)

**TABLE 3-7**

**SUMMARY OF CANCER RISK**

| EXPOSURE PATHWAY | Maximum Exposed Individual Worker | Maximum Exposed Individual Resident |
|---|---|---|
| Inhalation | 7.30E-07 | 1.90E-06 |
| Dermal | 1.11E-07 | 5.08E-08 |
| Soil Ingestion | 1.90E-07 | 1.53E-07 |
| Water Ingestion | - | - |
| Ingestion of Home Grown Produce | - | 3.82E-07 |
| Ingestion of Animal Products | - | - |
| Ingestion of Mother's Milk | - | - |
| **Total Cancer Risk** | **1.03E-06** | **2.49E-06** |

**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 Clean Air Act, which regulates 189 toxic air contaminants. The regulations implementing Title III have not been developed. Title V of the Act establishes a federal permit program. The Refinery 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**: CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act and federal Clean Air Act, and for regulating emissions from consumer products and motor vehicles. 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. CARB has established emission standards for vehicles sold in California and for various types of equipment. 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. CARB adopted the Reformulated Gasoline Phase III regulations which required, among other things, that California phase out the use of MTBE in gasoline by December 31, 2003.

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), 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 in all areas within the SCAQMD's jurisdiction. 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.

Asbestos is a toxic air contaminant and regulated under SCAQMD Rule 1403, Asbestos Emissions from Demolition/Renovation Activities. Rule 1403 requires that the facility conduct a survey of the structures to be removed for the presence of friable asbestos-containing material, notify the SCAQMD of the intent to demolish or renovate the facilities, remove asbestos-containing material before activities begin that would break up, dislodge, or disturb the asbestos-containing material, and establishes procedures for the handling of and control of asbestos-containing material.

## B. HAZARDS AND HAZARDOUS MATERIALS

Hazards at a facility can occur due to natural events, such as earthquake, and non-natural events, such as mechanical failure or human error. A hazard analysis generally considers compounds or physical forces that can migrate off-site and result in acute health effects to individuals outside of the proposed project site. The risk associated with a facility is defined by the probability of an event and the consequence (or hazards) should the event occur. The hazards can be defined in terms of the distance that a release would travel, or the number of individuals of the public affected by a maximum single event defined as a "worst-case" scenario. This section discusses existing hazards to the community from potential upset conditions at the Refinery to provide a basis for evaluating the changes in hazards posed by the proposed project.

The major types of public safety risks at the Refinery consist of risk from releases of regulated substances and from major fires and explosions. The discussion of the hazards associated with the existing Refinery relies on data in the Worst Case Consequence Analysis for the Alkylation Improvement Project (see Appendix C).

Shipping, handling, storing, and disposing of hazardous materials inherently poses a certain risk of a release to the environment. The regulated substances currently handled by the Refinery include chlorine, hydrofluoric acid, and ammonia. The Refinery also handles petroleum products including propane, butane, isobutane, gasoline, fuel oils, diesel and other products, which pose a risk of fire and explosion at the Refinery. Accident scenarios for the existing Refinery evaluated herein include releases of regulated substances and potential fires/explosions. The transportation risks are also described below.

### Types of On-Site Hazards

A hazard analysis generally considers the compounds or physical forces that can migrate off-site and result in acute health effects to individuals outside of the Refinery boundaries. It should be noted that hazards exist to workers on-site. However, the workers have the benefit of training in fire and emergency response procedures, protective clothing, access to respiratory protection, and so forth. The general public does not typically have access to these safety precautions and measures in the event that the hazard situation occurs or migrates off-site. Therefore, workers could be exposed to hazards and still be protected because of training and personal protective equipment.

Hazards can be defined in terms of the distance that a release may travel by maximum single events (defined as "worst-case" scenarios). “Worst-case” scenarios represent the maximum extent of potential hazards that could occur within the process area that was evaluated, based on "worst-case" (generally low wind speed) meteorological conditions and assuming a complete release of materials.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including the following events.

**Exposure to Toxic Gas Clouds:** Toxic gas clouds, (gas or liquefied gas with hydrogen fluoride or hydrogen sulfide), which could form a cloud and migrate off-site, thus, exposing individuals to toxic materials. “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.

**Exposure to Flame Radiation:** Flame (thermal) radiation is the heat generated by a fire and the potential impacts associated with exposure to it. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

Thermal radiation can be caused by pool fire (tank fire, spill into diked areas), torch fire (rupture of line followed by ignition), BLEVE (boiling liquid-expanding vapor explosion of a pressurized storage vessel) and/or flash fires (ignition of slow-moving flammable vapors).

**Exposure to Explosion Overpressure:** Several process vessels containing flammable explosive vapors and potential ignition sources are present at the Refinery. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source. The greatest threat could occur from a vapor cloud explosion (release, dispersion, and explosion of a flammable vapor cloud), or a confined explosion (ignition and explosion of flammable vapors within a building or confined area). An explosion could cause impacts to individuals and structures in the area due to overpressure.

A summary of the types of existing hazards at the Refinery associated with the units at the Refinery that are a part of the proposed project (Alkylation Improvement project) is shown in Table 3-8.

**Exposure to Contaminated Water:** An upset condition and spill has the potential to affect ground water and water quality. A spill of hazardous materials could occur under upset conditions, e.g., earthquake, tank rupture, and tank overflow. In the event of a spill, materials could migrate off-site if secondary containment and appropriate spill control measures are not in place.

**TABLE 3-8**

**SUMMARY OF EXISTING HAZARDS(1)**

| Area Description(2) | Type of Hazards Found in the Area |
|---|---|
| Process areas<br>NHT<br>LER1<br>LER2<br>MEROX<br>ALKY<br>FGTU<br>BUTAMER | Breach of liquid line or vessel resulting in:<br>Pool fire |
| | Breach of flashing liquid line or vessel resulting in:<br>Flash fire<br>Vapor cloud explosion<br>Pool fire<br>Torch fire<br>Toxic cloud (hydrogen fluoride, hydrogen sulfide) |
| | Breach of vapor line or vessel resulting in:<br>Torch fire<br>Vapor cloud explosion<br>Toxic cloud (hydrogen sulfide) |
| Storage<br>Tank<br>LPG<br>AQNH3 TANK | Breach of atmospheric storage resulting in:<br>Tank fire<br>Impounding area fire<br>Toxic cloud (ammonia) |
| | Breach of flashing liquid line or vessel resulting in:<br>Flash fire<br>Vapor cloud explosion<br>Pool fire<br>Torch fire |
| | BLEVE of pressurized storage vessel |
| Auxiliary systems<br>HOH<br>BOILER | Breach of low pressure piping resulting in:<br>Pool fire |
| | Breach of vapor line resulting in:<br>Torch fire |

(1) The hazard analysis is limited to the units being modified as part of the proposed project.
(2) FCCU = Fluid catalytic cracking unit. GCU/SHU = Gas concentration/selective hydrogenation unit. NHT = Naphtha hydrotreating unit. OLEFIN = Olefin treater unit. LER1, LER2 = Light ends recovery units. MEROX = Fuel gas mercapten treatment unit. VCE = Vapor cloud explosion. BLEVE = Boiling liquid expanding vapor explosion

## Transportation Risks

The transportation of hazardous substances poses a potential for fires, explosions, and hazardous materials releases. 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 maximum volume of a hazardous substance that can be released in a single accident, should an accident occur, and the type of failure of the containment structure, 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.

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.

Every time hazardous materials are moved from the site of generation, opportunities are provided for accidental (unintentional) 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 involvement rates presented in Table 3-9. This information was summarized from the Los Angeles County Hazardous Waste Management Plan (Los Angeles County, 1988).

**TABLE 3-9**

**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 | 0.70 |
| Composite* | 0.28 |

Source: Transportation Research Board, 1984.
* Average number for transport on interstates, highways, and urban roadways.

The County of Los Angeles has developed criteria to determine the safest transportation routes. Some of the factors which need to be considered when determining the safest direct routes include traffic volume, vehicle type, road capacity, pavement conditions, emergency response capabilities, spill records, adjacent land use, and population density. In managing the risk involved in the transportation of hazardous materials, all these factors must be considered.

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 3-10 estimates the accident rate for truck traffic assuming an average truck accident rate of 0.28 accidents per million miles traveled (Los Angeles County, 1988). The estimated accident rate associated with the existing Refinery is about 0.37, or about one accident every 2.7 years.

The actual occurrence 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.

**TABLE 3-10**

**REFINERY PREDICTED TRUCK ACCIDENT RATES ASSOCIATED WITH THE CURRENT REFINERY OPERATIONS**

| Trucks | No. of Trips per Week(1) | Approx. Miles One Way | Estimated Accident Rate per Year(2) |
|---|---|---|---|
| Delivery/transport trucks: | | | |
| Gas Oil | 257 | 25 | 0.094 |
| Propane | 78 | 25 | 0.028 |
| Butane | 61 | 25 | 0.022 |
| Sulfur | 82 | 10 | 0.012 |
| Chemicals | 17 | 25 | 0.006 |
| Distillate Materials | 375 | 30 | 0.164 |
| Deliveries | 100 | 25 | 0.036 |
| Misc. | 12 | 30 | 0.005 |
| **TOTALS:** | **982** | | **0.37** |

(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.

The hazards associated with the transport of regulated (CCR Title 19, Division 2, Chapter 4.5 or the CalARP requirements) hazardous materials, e.g., anhydrous ammonia and hydrogen fluoride, would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Ammonia and hydrogen fluoride are currently used and transported to the Refinery. Factors such as amount transported, wind speed, ambient temperatures, route traveled, distance 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. The most important and relevant regulations relative to hazards are summarized in the following paragraphs.

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 handle 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. Ultramar has complied with the RMP requirements and has submitted the appropriate reports. The Los Angeles City Fire Department administers the CalARP program for the Refinery. The Refinery is also required to comply with the U.S. EPA's Emergency Planning and Community Right-to-Know Act (EPCRA), which requires annual reporting of releases from the Refinery and specific requirements in the event of an emergency release.

All Refinery facilities have 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. Additional spill equipment is available through commercial contracts with suppliers that specialize in spill cleanup. Commercial contractors that specialize in oil cleanup are employed to place any additional booms or other spill capture equipment, if necessary, and to remove oil from the water, if the oil is released into waterways, e.g., the Dominguez Channel.

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. HYDROLOGY AND WATER QUALITY

### Water Demand

The Refinery purchases water from the Los Angeles Department of Water and Power (LADWP). Water is used in various refinery processes including crude desalting, cooling towers, and steam generation. The Refinery estimates that its current water consumption is about 650 gallons per minute or about 936,000 gallons per day (about 341,640,000 gallons per year).

### Ground Water Quality

The proposed project sites are located over the Los Angeles Basin ground water aquifer system. Four major aquifers are present within the Los Angeles Basin, and are used for industrial and municipal water supply outside of the harbor area. In the Wilmington area, no aquifers are present that have a usable fresh water supply because of salt water intrusion. From oldest to youngest, these aquifers include the Silverado, Lingo, Gaspur, and Gage Aquifers which are found within the San Pedro Formation. Movement along seismic faults within this zone has created barriers to the migration of ground water within these aquifers. These barriers subdivide the Los Angeles River Basin into separate ground water basins. The proposed project is located within the West Coast Basin. Site-specific ground water information described below is derived from the California Department of Water Resources Bulletin No. 104 (1961) and Zielbauer et al. (1962).

The top of the lower Pleistocene Silverado Aquifer is found at a depth of approximately 800 feet. It is divided into upper and lower zones reaching a total thickness between 400 and 450 feet. An unnamed aquatard, about 100 feet thick, overlies the Silverado Aquifer. (Note that an aquatard is a geologic formation through which virtually no water moves.) It is composed of marine clays, silt and sandy silt. The Lingo Aquifer, overlies this aquatard, and is found at a depth of 300 to 350 feet. It is approximately 50 feet thick. An unnamed aquatard overlies the Lingo Aquifer separating it from the overlaying Gage Aquifer. It consists of clays, silts, sandy silts, and sandy clays, reaching a thickness of about 50 feet. The upper Pleistocene Gage Aquifer is found at a depth between 100 to 250 feet below site, reaching a thickness of approximately 150 feet.

The recent Gaspur Aquifer fills a trench incised (or cut) into upper Pleistocene marine deposits (Gage Aquifer), down to a depth of about 180 feet below sea level. The aquifer is comprised of trench-filling sands and gravels of the ancestral Los Angeles River. This aquifer is in hydraulic continuity with the water of San Pedro Bay. The proposed project is located near the western boundary of this aquifer, where the ancestral river drained into the ocean. The top of the Gaspur Aquifer may be 90 feet below sea level at the site. The exact depth of the aquifer unit in the area is not known.

Ground water within the Silverado, Lingo, Gage, and Gaspur Aquifers underlying the project sites is not considered usable for a fresh water supply. Seawater intrusion has occurred along much of the coastal area as a result of historic fresh ground water removal in portions of the Los Angeles Basin. Chloride levels of the Gage Aquifer are estimated at 15,000 parts per million (ppm), and those of the Gaspur Aquifer are estimated at over 18,000 ppm. Both the Lingo and Silverado Aquifers also exhibit elevated chloride levels and very low transmissivities (the rate that water moves through a unit area times the thickness of the aquifer). Shallow saline ground water has no direct beneficial uses except for limited industrial uses such as reinjection water for enhanced oil recovery operations.

Steam injection wells are in use near the Refinery. These wells penetrate the Gaspur Aquifer to inject steam into the Tar Zone, which is about 2,500 feet below mean sea level. This steam flooding technology is used to enhance oil recovery operations within the Wilmington Oil Field.

The refinery has an on-going ground water monitoring program within the existing Refinery designed to detect hydrocarbon contamination. The monitoring program requires quarterly monitoring, sampling, and laboratory analyses for total petroleum hydrocarbons (as diesel and as gasoline), benzene, toluene, ethylbenzene, and total xylenes, MTBE, pH, electrical conductivity, and total dissolved solids. There are currently 20 ground water monitoring wells at the Refinery. Based on the results of recent monitoring, nine of the wells contained free hydrocarbon product. The majority of free product appears to be limited to the following areas: (1) near the intersection of E street and J Street; (2) the area southwest of Tank 95-TK-1; (3) the area southeast of tank 81-TK-4; and (4) the vicinity of the former safety basin. With the exception of the area around Tank 95-TK-1, these areas coincide with locations of historic oil field trenches, sumps, and or spreading grounds.

The depth to ground water also is monitored on a quarterly basis as part of the Refinery's ground water monitoring program. The depth to ground water ranges from about three to 10 feet below ground level. The ground water flow in the vicinity of the Refinery is generally south to southeast, i.e., towards the ocean.

In 1985, the RWQCB adopted Order 85-17 requiring the Refinery (and 14 other local refineries) to conduct subsurface investigations of soil and ground water. CEQA Section 21092.6 requires the lead agency to consult the lists compiled pursuant to Section 65962.5 of the Government Code to determine whether the project and any alternatives are located on a site which is included on such list. The SCAQMD has not received any list compiled and distributed by CalEPA in accordance with Government Code Section 65962.5. However, the SCAQMD has been informed that the Refinery is included on a list compiled by CalEPA and dated May 6, 1999. The SCAQMD was advised that the Refinery is listed on the May 6, 1999 list because it is on a list of Cleanup and Abatement Orders prepared by the State Water Resources Control Board (Order No. 97-118).

| | |
|---|---|
| Applicant: | Ultramar Inc. – Valero Wilmington Refinery |
| Address: | 2402 Anaheim Street, Wilmington, California 90809 |
| Phone: | (562) 491-6877 |
| Address of Site: | 2402 Anaheim Street, Wilmington, California 90809 |
| Local Agency: | Wilmington, City of Los Angeles |
| Assessor's Book: | 7440-2-20,22 |
| List: | See above. |
| Regulatory ID No: | 4B192023NO6 |
| Date of List: | See above. |

**Surface Water Quality Setting**

The Refinery is located immediately east of the Dominguez Channel, less than one-half mile north of the Cerritos Channel, and approximately 1.3 miles west of the Los Angeles River. The Los Angeles River and the Dominguez Channel are the major drainages that flow into the Los Angeles-Long Beach Harbor complex. Sediments and contaminants are transported into the harbor with the flows from the Los Angeles River and, to a lesser degree, the Dominguez Channel.

The Los Angeles River drains an 832-square mile basin, and enters Long Beach Harbor approximately 2.2 miles east of the proposed project. The Los Angeles River watershed is controlled by a series of dams and an improved river channel with a design flow capacity of 146,000 cubic feet per second.

The Dominguez Channel originates in the area of the Los Angeles International Airport and flows southward into the East Channel of the Los Angeles Harbor. The Dominguez Channel, an 8.5-mile long structure, drains approximately 80 square miles west of the Los Angeles River drainage basin. Permitted discharges from industrial sources are a substantial percentage of the persistent flows in the Dominguez Channel. Water quality objectives and beneficial uses for the Dominguez Channel tidal prism have been established by the Regional Water Quality Control Board, Los Angeles Region, in the Water Quality Control Plan for the Los Angeles River Basin.

**Storm Water**

Surface water runoff, and storm water runoff, is controlled by the Refinery in order to prevent direct runoff into the Dominguez and Cerritos Channels. Storm water which falls in the process units is processed through the Refinery's effluent water treatment system prior to discharge into the LACSD sewerage system. The Refinery has provisions to release storm water runoff from areas outside the process units to a storm water system owned by the Port of Long Beach. The storm water runoff is sampled according to the Port's National Pollutant Discharge Elimination System (NPDES) Permit issued by the RWQCB. The NPDES permit regulates discharges to surface water bodies. In accordance with the NPDES permit, effluent is monitored at the point of discharge to the Cerritos Channel. The storm water runoff must meet minimum oil and grease, phenol, and total residual chlorine requirements prior to discharge to the Cerritos Channel.

**Spill Control and Containment**

The Refinery has a Spill Prevention, Control and Countermeasure (SPCC) Plan, as required by 40 CFR Part 112. The purpose of these plans is to prevent the discharge of oil into navigable waters and to contain such discharge should they occur. The SPCC describes the spill prevention and containment methods implemented at the Refinery. Primary spill prevention methods implemented by the Refinery include: automatic tank gauging devices that measure the level in storage tanks; doubled bottom tanks; diking around all tanks to contain leaks or spills; and pipeline integrity testing. A wall, seven feet high, is constructed on the western boundary of the Refinery which provides a barrier to prevent spilled material from migrating into the Dominguez Channel.

The Refinery maintains an Oil Spill Contingency Plan which includes support by oil spill response companies that have the capability to provide additional oil booms and barriers in the event of a spill. Response times range from 15 minutes to one hour. In addition, there is a permanent oil containment boom installed across the Dominguez Channel at Henry Ford Avenue.

**Wastewater**

Major sources of wastewater at the Refinery include water containing impurities from splitters and strippers (stripped sour water); desalter water; water discharged from cooling towers (blowdown); boiler blowdown; oily water from drips, spills, washdown water, and contaminated storm water runoff from paved portions of the process areas; water softener regeneration; storage tank drainoff water; and ground water from free hydrocarbon recovery. A considerable volume of water is lost through evaporation at the cooling towers and through coke handling operations.

Oily wastewater, collected in the enclosed sewers, flows from a diversion box to an API separator, and then to a surge tank feeding an induced gas unit (IGU). Non-oily wastewater collected from other sources is stored in separate storage tanks and is pumped, with the discharge from the IGU, to the LACSD sewer. During periods of high water runoff (heavy rainfall), water in the diversion box is pumped into the storm water tank and is stored until it can be treated and discharged.

Sour water, produced in the Refinery process units, is treated in the Sour Water Strippers. Stripper overhead is sent to the Sulfur Recovery Unit and the Stripper bottoms are reused in the Refinery or are sent to the effluent water treating system. The Refinery utilizes a pressurized drain system to minimize fugitive hydrocarbon emissions. This drain system terminates at the Refinery vapor recovery area, where a knockout vessel removes liquids. Vapors are routed to the vapor recovery system, and the water is routed to the Sour Water Stripping Unit.

Wastewater generated by the Refinery is treated by the LACSD at its Joint Water Pollution Control Plant (JWPCP) located in Carson. The Refinery currently discharges an average of about 1.0 million gallons per day of wastewater. Wastewater discharge is regulated by the LACSD through an Industrial Wastewater Discharge Permit (Permit No. 11945 R1) which was issued on July 27, 2000. The LACSD regulates the discharges through enforceable permit conditions that limit the total wastewater discharge, the temperature, concentration of various pollutants, and pH. Table 3-11 provides the wastewater effluent limitations. The LACSD permit allows a discharge of 409.62 x $10^6$ gallons per year of wastewater.

**TABLE 3-11**

**MAXIMUM ALLOWABLE WASTEWATER CONCENTRATIONS FROM THE INDUSTRIAL WASTEWATER DISCHARGE PERMIT**

| CONSTITUENT | DAILY MAXIMUMS | UNITS |
|---|---|---|
| Flow | 409.42 | $10^6$ gal/yr |
| Temperature $^oF$ | <140 | $^oF$ |
| pH | >6 | pH units |
| Dissolved sulfides | 0.1 | mg/l |
| Oil and Grease | 75 | mg/l |
| Ammonia | 100 | mg/l |
| Total Mercaptans | 2.0 | mg/l |
| Thiosulfate | 50 | mg/l |
| Flammable materials | <20% | LEL |
| Arsenic | 3 | mg/l |
| Cadmium | 15 | mg/l |
| Chromium (total) | 10 | mg/l |
| Copper | 15 | mg/l |
| Lead | 40 | mg/l |
| Mercury | 2 | mg/l |
| Nickel | 12 | mg/l |
| Silver | 5 | mg/l |
| Zinc | 25 | mg/l |
| Cyanide (total) | 10 | mg/l |
| Chlorinated hydrocarbons | None | - |

**Regulatory Background**

The Federal Clean Water Act of 1972 primarily establishes regulations for pollutant discharges into surface waters. This Act requires industries that discharge wastewater to municipal sewer systems to meet pretreatment standards. The regulations authorize the U.S. EPA to set the pretreatment standards. The regulations also allow the local treatment plants to set more stringent wastewater discharge requirements, if necessary, to meet local conditions.

The 1987 amendments to the Clean Water Act enabled the U.S. EPA to regulate, under the National Pollutant Discharge Elimination System program, storm water discharges from industries and large municipal sewer systems. The U.S. EPA set initial permit application requirements in 1990. The State of California, through the State Water Resources Control Board, has authority to issue general industrial storm water permits, which meet U.S. EPA requirements, to specified industries.

The Porter-Cologne Water Quality Act is the state of California's primary water quality control law. It implements the state's responsibilities under the Federal Clean Water Act, but also establishes state wastewater discharge requirements. The RWQCB administers the state requirements as specified under the Porter-Cologne Water Quality Act, which include storm water discharge permits. The Los Angeles County Sanitation Districts assumes responsibility for establishing discharge standards for sewer discharges into the LACSD's system.

In response to the Federal Act, the State Water Resources Control Board prepared two state-wide plans that address storm water runoff: the California Inland Surface Waters Plan and the California Enclosed Bays and Estuaries Plan. These Plans contain similar provisions and complement each other. Both establish numerous water quality objectives for water bodies. The California Enclosed Bays and Estuaries Plan specifies the Los Angeles-Long Beach Harbor (to which surface water from the Los Angeles River eventually flows) as an enclosed bay.

## D. NOISE

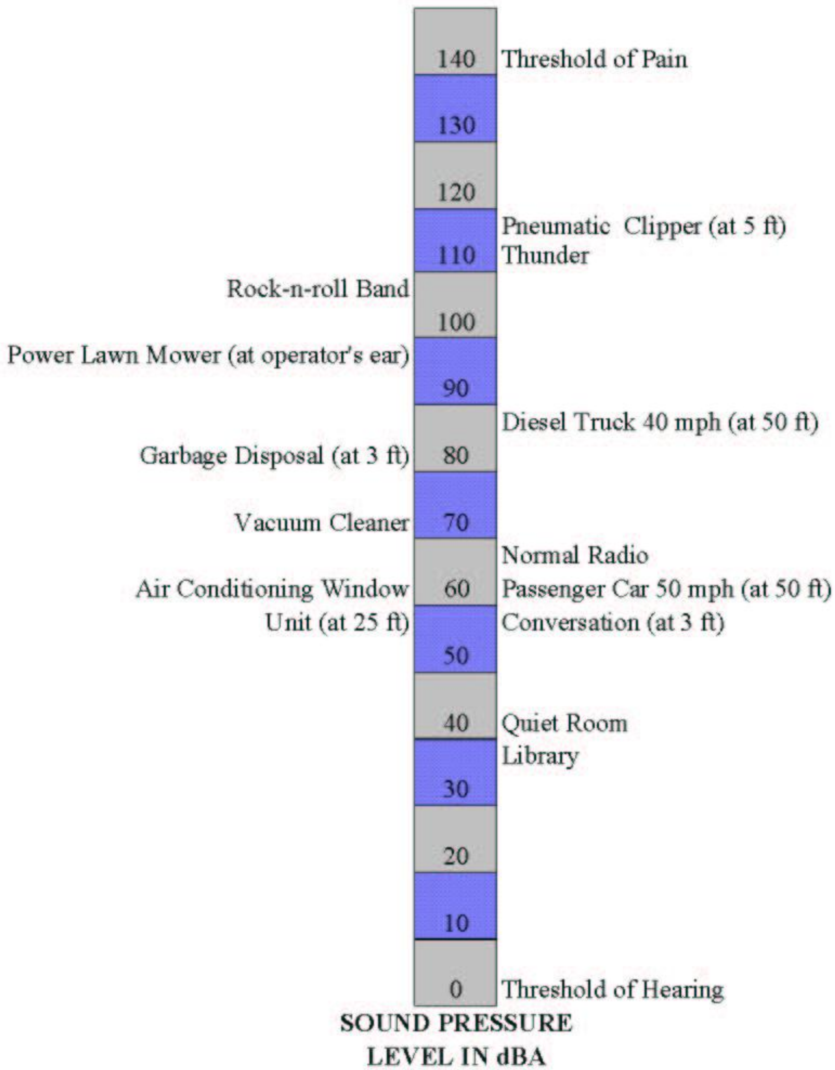
Noise is a by-product of urbanization and there are numerous noise sources and receptors in an urban community. Noise is generally defined as unwanted sound. The range of sound pressure perceived as sound is extremely large. The decibel is the preferred unit for measuring sound since it accounts for these variations using a relative scale adjusted to the human range for hearing (referred to as the A-weighted decibel or dBA). The A-weighted decibel is a method of sound measurement which assigns weighted values to selected frequency bands in an attempt to reflect how the human ear responds to sound. The range of human hearing is from 0 dBA (the threshold of hearing) to about 140 dBA which is the threshold for pain. Examples of noise and their A-weighted decibel levels are shown in Figure 3-3.

In addition to the actual instantaneous measurements of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. To analyze the overall noise levels in an area, noise events are combined for an instantaneous value or averaged over a specific time period. The time-weighted measure is referred to as equivalent sound level and represented by energy equivalent sound level (Leq). The percentage of time that a given sound level is exceeded also can be designated as $L_{10}$, $L_{50}$, $L_{90}$, etc. The subscript notes the percentage of time that the noise level was exceeded during the measurement period. Namely, an $L_{10}$ indicates the sound level is exceeded 10 percent of the time and is generally taken to be indicative of the highest noise levels experienced at the site. The $L_{90}$ is that level exceeded 90 percent of the time and this level is often called the base level of noise at a location. The $L_{50}$ sound (that level exceeded 50 percent of the time) is frequently used in noise standards and ordinances.

The sound pressure level is measured on a logarithmic scale with the 0 dBA level based on the lowest detectable sound pressure level that people can perceive. Decibels cannot be added arithmetically, but rather are added on a logarithmic basis. A doubling of sound energy is equivalent to an increase of three dBA. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged twice as loud. In general, a three to five dBA change in community noise levels starts to become noticeable, while one-two dBA changes are generally not perceived (City of Los Angeles, 1998).

**FIGURE 3-3**

**GENERAL NOISE SOURCES AND THEIR SOUND PRESSURE LEVELS**




Sources: Industrial Noise Manual, 3rd Edition, AIHA, 1975; City of Long Beach, 1975

Vacuum Cleaner

### Refinery Existing Noise Levels

The vicinity of the proposed Refinery project is an urban environment characterized by extensive industrial, commercial and transportation-related land uses. The Refinery is surrounded by industrial facilities, commercial activities and transportation corridors. Major contributors to the ambient noise levels in the general vicinity of the Refinery include the following:

- The local railways which run along the northern and western boundaries of the Refinery;

- Vehicular traffic on the Terminal Island Freeway, Henry Ford Avenue, and Anaheim Street, especially the large number of trucks that use these arterials into and out of the port area;

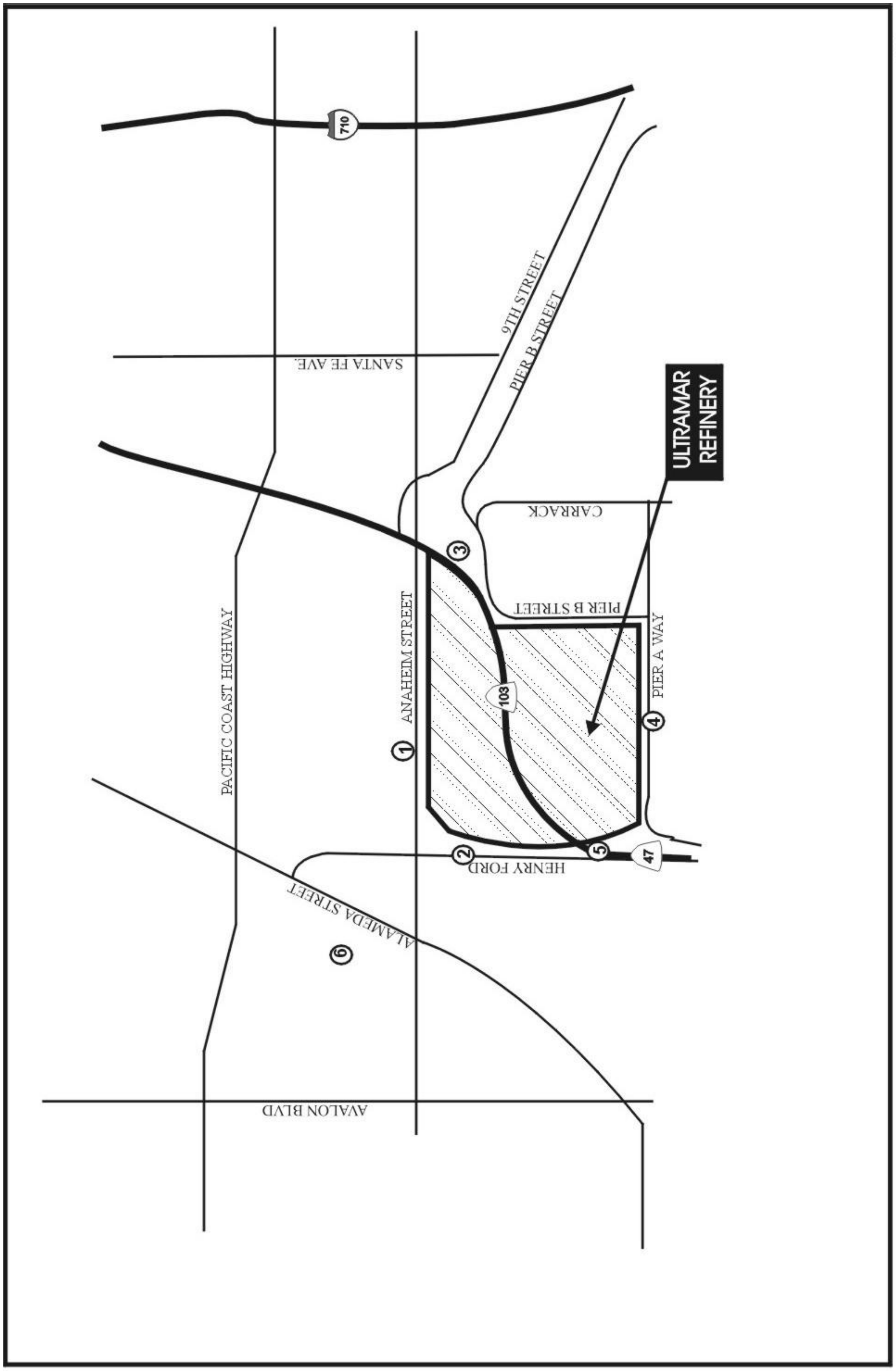
- The industrial facilities which include the Refinery, a hydrogen plant, a coke calcining facility, cogeneration plant, container facilities, automobile import facilities, other refineries, and automobile wrecking/dismantling operations; and

- The numerous port-related activities such as vessel traffic and loading/unloading of cargo.

Traffic, both vehicular and railroad, is a major source of noise in the area. The Terminal Island Freeway is a major noise source at the site since it is elevated above most structures and buildings; therefore, the noise is not attenuated as quickly as noise generated at ground level. The estimated noise level 50 feet from the Terminal Island Freeway is about 70 dBA. Elevated railroad tracks have also been constructed along the western portion of the Refinery as part of the Alameda Corridor and are a source of noise in the area.

The principle noise sources in an industrial area are impact, friction, vibration, and air turbulence from air and gas streams. Process equipment, heaters, cooling towers, pumps and compressors, contribute to noise emitted from the Refinery. The major noise sources within the Refinery are associated with the main processing units. Noise surveys conducted near the processing units of the Refinery indicate elevated noise readings in the typical range of 80 to 95 dBA at areas within or adjacent to the processing units. Elevated noise sources are not attenuated as quickly as ground sources due to the lack of interference from fences, structures, buildings, etc. Most of the noise sources at the Refinery are not elevated but are located near ground level.

The Refinery is located in an M3-1 zoned (heavy industrial) area, as established by the City of Los Angeles. The areas surrounding the Refinery are also industrial. Noise readings were taken in the area surrounding the Refinery in October 2003 (see Figure 3-4). The location of the noise readings are identified in Figure 3-4 and explained in Table 3-12. Measurements were taken during the morning, afternoon, evening, and nighttime using a GenRad Sound Level Meter. Noise readings were taken at approximately five feet above the local grade at all locations. The measurements quantified the equivalent sound levels over a 24-hour period and were used to estimate the Community Noise Equivalent Level (CNEL). The results of the background noise readings are provided in Table 3-13.




N

ULTRAMAR INC. - VALERO WILMINGTON REFINERY
NOISE MEASUREMENT LOCATIONS

*Figure 3-4*

ENVIRONMENTAL AUDIT, INC.®

*Project No. 2185*
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## TABLE 3-12

## NOISE LEVEL MEASUREMENT LOCATIONS

| LOCATION | DESCRIPTION |
|---|---|
| 1 | At the corner of Anaheim St. and Sigsbee Ave. North of the Refinery in an industrial area with scrap yard facilities and container operations. The dominant source of noise is traffic on Anaheim Street. Noise levels associated with trucks at this location were about 82 dBA. |
| 2 | On Henry Ford south of the Air Products hydrogen plant. West of the Refinery, elevated railroad tracks and the Dominguez Channel in an industrial area. The dominant noise sources are trains along the elevated track that runs between the Refinery and hydrogen plant, and cooling towers at the hydrogen plant. |
| 3 | On Pier B Street at the intersection with Carrack Ave. East of the Refinery and the Terminal Island Freeway in an industrial area next to the Toyota import facility, ARCO Coke Calcining (CQC) plant, and the Harbor Cogeneration Plant. Dominant noise sources include the ARCO CQC plant, Harbor Cogeneration Plant, the Refinery and the Terminal Island Freeway. |
| 4 | On Pier B Street about 500 feet east of Hanjin Way. South of the Refinery and across the street from the Hanjin container terminal in an industrial area. The dominant noise source is the Refinery and trucks along Pier B street. |
| 5 | On Pier B Street about 200 feet east of the GOH unit at the Refinery and about 100 feet east of Henry Ford Avenue. West of the Refinery in an industrial area adjacent to the Terminal Island Freeway. The dominant noise source is the Refinery GOH unit and traffic along the Terminal Island Freeway. |
| 6 | On Blinn Avenue at the intersection of Grant St. Northwest of the Refinery in a residential area located adjacent to Pacific Concrete plant. Dominant noise sources are the concrete plant and container truck loading facility. |

## TABLE 3-13

## SAMPLING RESULTS
## BACKGROUND AMBIENT NOISE LEVELS (decibels)

| LOCATION | NOISE LEVELS (decibels) | | | | |
|---|---|---|---|---|---|
| | Morning | Afternoon | Evening | Nighttime | CNEL |
| 1 | 74.4 | 71.2 | 66.6 | 64.2 | 72.9 |
| 2 | 64.6 | 64.8 | 63.8 | 61.4 | 67.4 |
| 3 | 63.4 | 66.6 | 67.2 | 60.8 | 68.3 |
| 4 | 61.8 | 64.2 | 63.0 | 61.0 | 66.3 |
| 5 | 65.8 | 66.8 | 63.6 | 64.2 | 68.9 |
| 6 | 57.4 | 58.8 | 52.6 | 62.6 | 61.6 |

* See Figure 3-4 for noise reading locations.

The ambient noise readings indicate that the noise levels in the vicinity of the proposed project sites are generally below the City of Los Angeles noise limits of 70 dBA at the property boundaries and acceptable for industrial zoned areas. Noise levels adjacent to the Refinery generally range from 60 to 70 dBA. Noise levels near Anaheim Street (north) and Henry Ford Avenue (west) tend to be higher than noise levels along Pier B Street (east and south). Traffic contributes to the higher noise readings along Anaheim Street and Henry Ford Avenue. During noise monitoring, traffic along Anaheim Street was higher than usual probably due to the closure of Pacific Coast Highway between the Terminal Island Freeway and Alameda Boulevard to construct an overpass (on Pacific Coast Highway over Alameda Boulevard). Since Anaheim Street, Henry Ford Avenue, and the Terminal Island Freeway are located very close to the Refinery boundaries, a portion of the ambient noise within the Refinery and at its boundary is due to traffic on these roadways.

Although there are numerous sources of noise in the area, there are few sensitive receptors (i.e., residential areas, hospitals, rest homes, and schools). The closest residential area to the Refinery is near the intersection of Blinn Avenue and Grant Street, west of Alameda Street. This residential area is about one-half mile northwest of the Refinery. The noise levels at this residential area (location 6) range from about 53 to 63 dBA. This residential area is affected by noise generated from a concrete plant, a container truck terminal, traffic noise along Anaheim Street and Alameda Street, and railway traffic noise since railroad tracks are located immediately adjacent to the residential area. The Refinery's contribution to noise at this location is negligible due to the presence of other industrial facilities and the distance of the residential area to the Refinery.

The Refinery's relative contribution to ambient noise during the night tends to be greater since noise from traffic in the area is reduced. For example, the noise contribution at Location 5 is primarily associated with operation of the GOH where the noise levels range from 64 to 67 dBA.

## Regulatory Background

The State Department of Aeronautics and the California Commission of Housing and Community Development have adopted the Community Noise Equivalent Level (CNEL). The CNEL is the adjusted noise exposure level for a 24-hour day and accounts for noise source, distance, duration, single event occurrence frequency, and time of day. The CNEL considers a weighted average noise level for the evening hours, from 7:00 p.m. to 10:00 p.m., increased by five dBA, and the late evening and morning hour noise levels from 10:00 p.m. to 7:00 a.m., increased by 10 dBA. The daytime noise levels are combined with these weighted levels and averaged to obtain a CNEL value. The adjustment accounts for the lower tolerance of people to noise during the evening and nighttime periods relative to the daytime period.

The noise element of the General Plan for the City of Los Angeles sets forth standards to control noises on land use zoning as shown in Table 3-14. The City's Noise Ordinances (Nos. 1156,363 and 11574) apply to the Refinery. The allowable noise level in residential areas during the day is 50 dBA and industrial areas is 70 dBA. The allowable noise level in residential areas during the night is 40 dBA and industrial areas is 70 dBA. The City of Los Angeles Noise ordinance prohibits construction noise between 9:00 p.m. and 7:00 a.m.

**TABLE 3-14**

**CITY OF LOS ANGELES NOISE ORDINANCE**
**(decibels)***

| ZONE | DAY | NIGHT |
|---|---|---|
| Residential Land Uses | 50 | 40 |
| Public and Commercial Land Uses<br>(P, PB, CR, C1, C2, C4, C5, CM) | 60 | 55 |
| Industrial Land Uses(M1, MR1, MR2) | 65 | 65 |
| Heavy Industrial Land Uses (M2, M3) | 70 | 70 |

* The "presumed minimum ambient noise levels" shown above are to be used only if the true "measured" ambient noise levels are less than the values designated. In most cases, when there is a difference between the measured ambient and the presumed ambient, the greater level will be allowed.

The U.S. EPA establishes noise standards for construction equipment according to the provisions of the Noise Control Act of 1972, set forth in 40 CFR Part 204. The Los Angeles Police Department enforces the provisions of the noise ordinance.

Land use compatibility guidelines have been developed and they outline noise exposure levels (Ldn or CNEL) which are clearly acceptable, normally acceptable, normally unacceptable, and clearly unacceptable at various land uses.

## E. TRANSPORTATION/TRAFFIC

### Regional Circulation

The Refinery is located south of Anaheim Street and east of Henry Ford Avenue. Regional access to the Refinery is provided by the Long Beach Freeway (I-710), which is located approximately one mile east of the proposed project and the Harbor Freeway (I-110), located approximately two and one-half miles west of the site. The Terminal Island Freeway bisects the Refinery site, but provides no access to the Refinery. These freeway facilities are major north and south highways, which extend from the Ports of Los Angeles and Long Beach through Los Angeles County. Pacific Coast Highway, Anaheim Street, and Alameda Street are key arterials servicing the area. Other key roadways in the local area network include "B" Street, Figueroa Street, Wilmington Boulevard, Sepulveda Boulevard, and Avalon Boulevard. Alameda Street has been and continues to be upgraded, expanded and modified to provide a dedicated roadway system for trucks and railcars leaving the Ports of Los Angeles/Long Beach to provide more efficient movements of goods and materials into/out of the port areas.

In addition to the freeway system, railroad facilities service the Refinery providing an alternative mode of transportation for the distribution of goods and materials. The area is served by the Union Pacific, and Atchison, Topeka and Santa Fe railroads with several main lines occurring near the Refinery.

The Refinery is located near the Ports of Long Beach and Los Angeles which provide a mode for transportation of goods and materials via marine vessels.

### Local Circulation

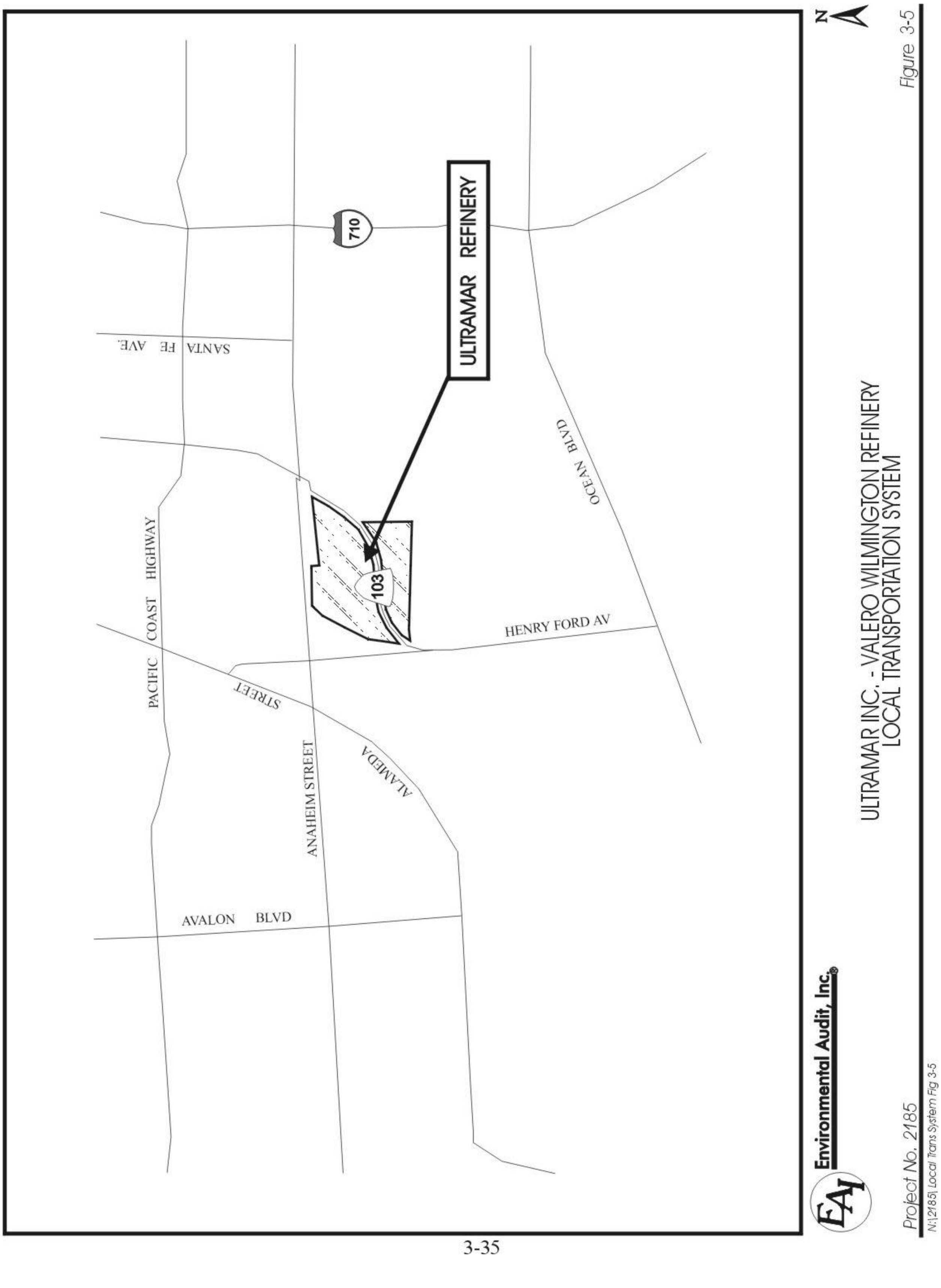
The Refinery is located at 2402 East Anaheim Street in the community of Wilmington, California, approximately one mile west of the Long Beach Interstate 710 Freeway. The Refinery occupies about 400 acres and is generally located between Anaheim Street on the north, Henry Ford Avenue on the west, Pier A Street on the south, and Pier B Street and the Terminal Island Freeway on the east (see Figure 3-5). The Refinery Plant currently employs about 250 full-time employees. The predominate route used to reach the Refinery is from the Long Beach Interstate 710 Freeway at Anaheim Street. Anaheim Street is an east-west, four lane divided roadway that carries about 20,000 to 24,000 vehicles per day.

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. LOS A to C operate well. Level C normally is taken as the design level in urban areas outside a regional core. Level D typically is the level for which a metropolitan area street system is designed. Level E represents volumes at or near the capacity of the highway which will result in possible stoppages of momentary duration and fairly unstable traffic flow. Level F occurs when a facility 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 August and September 2003 to determine the existing traffic in the area. The data have been increased by 1% per year to account for the fact that the construction period will begin in 2005. Peak hour LOS analyses were developed for intersections in the vicinity of the Refinery (see Table 3-15). The LOS analysis indicates typical urban traffic conditions in the area surrounding the Refinery, with most intersections operating at Levels A to B during morning and evening peak hours. The intersection of Wilmington Avenue and 223rd Street, located over two miles north of the Refinery (and adjacent to the British Petroleum Refinery), operates at Level C during a.m. peak hours and Level D during p.m. peak hours. Traffic associated with the Refinery generally would not impact this intersection. An LOS analysis was not completed for the intersection of Alameda Street and Pacific Coast Highway because Pacific Coast Highway is closed to through traffic at this intersection in order to construct an overpass over Alameda Street. Construction of this overpass is currently underway and expected to take several years to complete. Therefore, traffic counts at this intersection would not be representative of normal traffic patterns.

### Regulatory Background

The City of Los Angeles Department of Transportation (LADOT) is responsible for transportation issues in the City. The City of Los Angeles prepared a Transportation Improvement and Mitigation Program (TIMP) for the Wilmington-Harbor City Community Plan through an analysis of the land use impacts on transportation. The TIMP establishes a program of specific measures which are recommended to be undertaken during the life of the Community Plan.



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ULTRAMAR REFINERY
710
103
SANTA FE AVE.
OCEAN BLVD
PACIFIC COAST HIGHWAY
HENRY FORD AV
STREET
ALAMEDA
ANAHEIM STREET
AVALON BLVD
Environmental Audit, Inc.
ULTRAMAR INC. - VALERO WILMINGTON REFINERY
LOCAL TRANSPORTATION SYSTEM
Figure 3-5
Project No. 2185
N:\2185\Local Trans System Fig 3-5

**TABLE 3-15**

**REFINERY REFORMULATED FUELS PROGRAM
EXISTING LEVEL OF SERVICE ANALYSIS
AND VOLUME-TO-CAPACITY-RATIOS**

| **INTERSECTION** | **A.M LOS** | **Peak Hour V/C** | **P.M. LOS** | **Peak Hour V/C** |
|---|---|---|---|---|
| Alameda St. and I-405 Ramps | A | 0.426 | A | 0.436 |
| Alameda St. and 223rd Ramps | A | 0.305 | A | 0.341 |
| ICTF enty/I-405 Ramps and Wardlow/223rd St. | A | 0.519 | A | 0.574 |
| Alameda St. and Sepulveda Blvd. | A | 0.416 | A | 0.365 |
| Alameda St. and Anaheim St. | B | 0.616 | B | 0.611 |
| Wilmington Ave. and 223rd St. | C | 0.718 | D | 0.826 |
| Wilmington Ave. and Sepulveda Blvd. | A | 0.588 | B | 0.622 |
| Santa Fe and Pacific Coast Hwy. | B | 0.636 | B | 0.671 |
| Henry Ford and Anaheim St. | A | 0.476 | A | 0.539 |
| Santa Fe and Anaheim St. | A | 0.454 | A | 0.462 |
| 9th St./“I” St. and Anaheim St. | A | 0.597 | A | 0.539 |

Notes: (1) = based on 2003 traffic data, adjacent by 1% per year growth rate to 2005, the beginning of the construction phase.
V/C = Volume to capacity ratio (capacity utilization ratio)
LOS = Level of Service

The Wilmington-Harbor City Community Plan provides specific objectives and goals for traffic in the area. It is the City’s objective that the traffic LOS on the street system in the community not exceed LOS E. Most of the Wilmington-Harbor City’s major street intersections and the intersections near the Refinery are in compliance with this policy. The City has prepared a Transportation Demand Management (TDM) program for the Wilmington areas that includes: (1) encouragement of the formation of Transportation Management Associations in order to assist employers in creating and managing trip reduction programs; (2) participation in local and regional TDM programs; (3) continued implementation of the Wilmington-Harbor City TDM which calls for several measures to be taken in developments to achieve trip reduction targets; (4) implementation of the bikeways Master Plan’s recommendations for the area; (5) encouragement of telecommuting to minimize traffic; (6) encourage the development of pedestrian oriented areas; and (7) development of a parking management strategy (City of Los Angeles, 1999).

New projects within the City must comply with the Congestion Management Program (CMP) for Los Angeles County, adopted by the Los Angeles County Metropolitan Transportation Authority in November 1995. The CMP involves monitoring traffic conditions on the designated transportation network, performance measures to evaluate current and future system performance, promotion of alternative transportation methods, analysis of the impact of land use decisions on the transportation network, and mitigation to reduce impacts on the network.