# CHAPTER 3.0

# 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 Tosco Wilmington Plant 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 section 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.

## AIR QUALITY

### Meteorological Conditions

The proposed project site is located within the South Coast Air Basin (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, which traps the cool marine air layer 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, impacts the air quality of 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 temperature varies 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. The 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 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 sources account for 65 percent of the volatile organic compound (VOC) emissions, 88 percent of the nitrogen oxides (NOx) emissions, 77 percent of the sulfur dioxides ($SO_2$) emissions, 99 percent of the carbon monoxide (CO) emissions, and 11 percent of the particulate matter less than 10 microns in diameter (PM10) emissions in the Basin. Emissions from on-road vehicles are much higher than those from off-road sources for all criteria pollutants except $SO_2$. This can be explained by the fact that the sulfur content in fuels used for off-road vehicles is relatively higher than in fuels used for on-road vehicles (SCAQMD, 1996).

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 (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 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.

## TABLE 3-1

## AMBIENT AIR QUALITY STANDARDS

| POLLUTANT | NATIONAL STANDARDS | STATE STANDARDS |
|---|---|---|
| Ozone | | |
| 1-hour | 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 $ug/m^3$ | 30 $ug/m^3$ |
| PM2.5: 24-hour | 65 $ug/m^3$ | None |
| Annual | 15 $ug/m^3$ | None |
| 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 -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

**Regional Air Quality**

The SCAQMD monitors levels of various criteria pollutants at 30 monitoring stations. In 1999, the Basin or district exceeded the federal and state standards for ozone at most monitoring locations on one or more days. The federal and state ozone standards were exceeded most frequently (30 and 93 days, respectively) in the Central San Bernardino Mountains. Other areas that frequently exceeded the state ozone standards include the San Gabriel Valley, Riverside, Coachella Valley and San Bernardino Valley.

In 1999, the state and federal maximum concentrations of CO were only exceeded in the South Central Los Angeles area. No other source receptor areas of the Basin exceeded the CO standards.

Portions of the Basin exceed the federal and state standards for PM10. The federal PM10 standards were only exceeded in Riverside and the San Bernardino Valley. The state PM10 standards were exceeded at most monitoring locations in the Basin including the coast, central Los Angeles, San Fernando Valley, Santa Clarita Valley, Orange County, Riverside, San Bernardino Valley and Coachella Valley.

In 1999, no areas of the Basin exceeded state or federal standards for NOx, SOx, lead or sulfate. Currently, the district is in attainment with all ambient air quality standards for lead, SOx, and NOx (SCAQMD, 2000). The SCAQMD predicts that the Basin will comply with the federal CO requirements by 2000 or 2001, the federal PM10 requirements by 2006, and the federal ozone standard by 2010 (SCAQMD, 1997). Compliance with the state standards for ozone and PM10 are not expected until after 2010 (SCAQMD, 1997).

**Local Air Quality**

The project site is located within the SCAQMD's South Coastal Los Angeles monitoring area. Recent background air quality data for criteria pollutants for the South Coast 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. The air quality in the South Coast Los Angeles monitoring area is classified as attainment for 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 8-hour ozone standard, and the 24-hour and annual PM10 standard. The air quality in the South Coast Los Angeles area is not in compliance with the state and federal 1-hour average ozone standard and the 24-hour PM10 and PM2.5 standard. The area has shown a general improvement in air quality since 1995 with decreasing concentrations of most pollutants (see Table 3-2).

## TABLE 3-2

## AMBIENT AIR QUALITY
## SOUTH COASTAL LOS ANGELES COUNTY MONITORING STATION (1995-1999)
## Maximum Observed Concentrations

| CONSTITUENT | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|
| Ozone: 1-hour (ppm) | 0.11 | 0.11 | 0.10 | 0.12 | 0.13 |
| Federal Standard | (0) | (0) | (0) | (0) | (1) |
| State Standard | (3) | (5) | (1) | (2) | (3) |
| 8-hour (ppm) | -- | -- | 0.07 | 0.08 | 0.08 |
| | -- | -- | (0) | (0) | (0) |
| Carbon Monoxide: | | | | | |
| 1-hour (ppm) | 9 | 10 | 9 | 8.0 | 7 |
| | (0) | (0) | (0) | (0) | (0) |
| 8-hour (ppm) | 6.6 | 6.9 | 6.7 | 6.6 | 5.4 |
| | (0) | (0) | (0) | (0) | (0) |
| Nitrogen Dioxide: | | | | | |
| 1-hour (ppm) | 0.21 | 0.17 | 0.20 | 0.16 | 0.15 |
| | (0) | (0) | (0) | (0) | (0) |
| Annual (ppm) | 0.037 | 0.034 | 0.0333 | 0.0339 | 0.0342 |
| PM10: | | | | | |
| 24-hour (ug/$m^3$) | 146 | 113 | 87 | 69 | 79 |
| federal standard | (0) | (0) | (0) | (0) | (0) |
| state standard | (18.6%) | (14.6%) | (17.5%) | (10.2%) | (13%) |
| Annual (ug/$m^3$) | | | | | |
| Geometric | 32.3 | 30.8 | 38.2 | 29.2 | 38.9 |
| Arithmetic | 38.7 | 35.3 | 40.5 | 32.3 | 36.4 |
| PM2.5: | | | | | |
| 24-hour (ug/$m^3$) | -- | -- | -- | -- | 66.9 |
| Federal standard | -- | -- | -- | -- | (1%) |
| Annual Arithmetic Mean | -- | -- | -- | -- | 21.5 |
| Sulfur Dioxide: | | | | | |
| 1-hour (ppm) | 0.14 | 0.04 | 0.04 | 0.08 | 0.05 |
| | (0) | (0) | (0) | (0) | (0) |
| 24-hour (ppm) | 0.018 | 0.013 | 0.011 | 0.013 | 0.011 |
| | (0) | (0) | (0) | (0) | (0) |
| Annual (ppm) | 0.0023 | 0.0025 | 0.0024 | -- | 0.0027 |
| Lead: | | | | | |
| 30-day (ug/$m^3$) | 0.05 | 0.08 | 0.05 | 0.07 | 0.06 |
| | (0) | (0) | (0) | (0) | (0) |
| Quarter (ug/$m^3$) | 0.04 | 0.08 | 0.03 | 0.04 | 0.05 |
| | (0) | (0) | (0) | (0) | (0) |
| Sulfate: | | | | | |
| 24-hour (ug/$m^3$) | 16.9 | 19.9 | 11.4 | 14.5 | 13.7 |
| | (0%) | (0%) | (0%) | (0%*) | (0%) |

Source: SCAQMD Air Quality Data Annual Summaries 1995-1999.

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. May not be representative.

### Wilmington Plant Criteria Pollutant Emissions

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

**TABLE 3-3**

**WILMINGTON PLANT BASELINE**
**CRITERIA POLLUTANT EMISSIONS**
**(tons/year)**

| REPORTING PERIOD | CO | VOC | NOx | SOx | PM10 |
|---|---|---|---|---|---|
| 1998-99 | 874 | 280 | 754 | 843 | 163 |
| 1999-2000 | 943 | 273 | 838 | 912 | 218 |
| Average Baseline Emissions* | 938.5 | 278 | 791.5 | 805.0 | 191 |

* Baseline emissions are based on the annual emission fee reports prepared for the SCAQMD during the July 1998 through June 1999 and July 1999 through June 2000 reporting period.

### Toxic Air Contaminants

Toxic air contaminants (TACs) are air pollutants which may cause or contribute to an increase in mortality or severe illness, or which may pose a potential hazard to human health. The California Health and Safety Code (§39655) defines a toxic air contaminant 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, evaluates and develops any needed control measures for air toxics. The general goal of regulatory agencies is to limit exposure to toxic air contaminants to the maximum extent feasible.

Monitoring for toxic air contaminants 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). Tosco is located closest to the North Long Beach station. A summary of the averaged data from 1997 and 1998 monitoring from the Long Beach station for various toxic air contaminants is considered to be an appropriate estimate of the toxic air contaminant concentration in the Long Beach area (see Table 3-4).

**TABLE 3-4**
**AMBIENT AIR QUALITY**
**TOXIC AIR CONTAMINANTS – NORTH LONG BEACH**
**1997-1998**

| POLLUTANT | ANNUAL AVERAGE | POLLUTANT | ANNUAL AVERAGE |
|---|---|---|---|
| VOC's | ppb/v[1] | | ppb/v |
| Acetaldehyde[2] | 1.43 | Methyl Ethyl Ketone[3] | 0.21 |
| Benzene | 0.87 | Methyl Tertiary Butyl Ether[2] | 2.73 |
| 1,3-Butadiene | 0.29 | Methylene Chloride | 0.67 |
| Carbon Tetrachloride[3] | 0.12 | Perchloroethylene | 0.16 |
| Chloroform | 0.04 | Styrene[3] | 0.13 |
| o-Dichlorobenzene[3] | 0.12 | Toluene | 2.75 |
| p-Dichlorobenzene[3] | 0.16 | Trichloroethylene | 0.29 |
| Ethyl Benzene | 0.39 | meta-Xylene | 1.02 |
| Formaldehyde[2] | 3.68 | ortho-xylene[3] | 0.41 |
| Methyl Chloroform | 0.21 | | |
| PAH's[7] | nanograms/m$^{3}$[4] | | nanograms/m$^{3}$ |
| Benzo(a)pyrene | 0.17 | Benzo(k)fluoranthene | 0.81 |
| Benzo(b)fluoranthene | 0.20 | Dibenz(a,h)anthracene | 0.03 |
| Benzo(g,h,i)perylene | 0.64 | Indeno(1,2,3-cd)pyrene | 0.29 |
| Inorganic Compounds | nanograms/m$^{3}$ | | nanograms/m$^{3}$ |
| Aluminum | 1,147.5 | Nickel | 7.0 |
| Antimony | 3.3 | Phosphorus | 44.7 |
| Arsenic[9] | 1.5 | Potassium | 501.5 |
| Barium | 41.7 | Rubidium | 1.95 |
| Bromine | 10.3 | Selenium | 1.5 |
| Calcium | 936.5 | Silicon | 3,000.0 |
| Chlorine | 2,215.0 | Strontium | 12.4 |
| Chromium | 5.9 | Sulfur | 1,235.0 |
| Cobalt | 8.0 | Tin | 4.6 |
| Copper | 23.1 | Titanium | 103.0 |
| Hexavalent Chromium | 0.13 | Uranium | 1.0 |
| Iron | 1,057.0 | Vanadium | 11.9 |
| Lead | 14.8 | Yttrium | 1.1 |
| Manganese | 19.4 | Zinc | 70.7 |
| Mercury | 1.6 | Zirconium | 4.7 |
| Molybdenum | 2.6 | | |

Source: CARB, ambient toxics air quality data for 1997 and 1998. The CARB notes that sampling periods shorter than 12 months are inappropriate for purposes of calculating annual averages.

Notes:

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

(2) Data is the annual average for 1997 as the data for 1998 is based on fewer than 12 months of valid data.

(3) Data is the annual average for 1998 as the data for 1997 is based on fewer than 12 months of valid data.

The SCAQMD measured toxic air contaminant 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 toxic air contaminants to 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. The SCAQMD has released a Final Report from this study which indicate 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 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 South Coast Air 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 Wilmington Plant. 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, 2000h).

The CARB has estimated cancer risk based on exposure to the background concentrations of toxic air contaminants 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 305 per million (see Table 3-5).

**Baseline Health Risk Assessment**

Toxic air contaminants (TACs) are emitted from the existing Tosco Wilmington Plant. 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 Wilmington Plant were recently quantified in an Air Toxics Inventory Report (ATIR) prepared for and submitted to the SCAQMD (June, 2000) to comply with the deadlines imposed under SCAQMD Rule 1402 – Control of Toxic Air Contaminants from Existing Sources. At SCAQMD's request, the Wilmington Plant's Health Risk Assessment (HRA), last done in 1991, was updated using the ATIR (June, 2000) 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 Wilmington Plant. 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 Wilmington Plant 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[(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: Average of CARB 1997 and 1998 toxic air contaminant monitoring data, 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.

# TABLE 3-6

## EMISSIONS OF INDIVIDUAL TOXIC AIR CONTAMINANTS

| CHEMICAL | CAS NO.[1] | Emissions (lbs/hr) | Emissions (lbs/yr) |
|---|---|---|---|
| Acenaphthene* | 83329 | 6.95E-06 | 4.30E-02 |
| Acenaphthylene* | 208968 | 3.09E-05 | 2.11E-01 |
| Acetaldehyde | 75-07-0 | 2.99E-01 | 2.00E+03 |
| Acrolein | 107028 | 2.52E-03 | 8.88E+00 |
| Ammonia | 7664-41-7 | 7.03E+01 | 5.40E+05 |
| Aluminum* | 7429905 | 4.77E-01 | 3.65E+03 |
| Anthracene* | 120127 | 8.31E-06 | 5.19E-02 |
| Antimony* | 7440-03-60 | 1.17E-03 | 6.72E+00 |
| Arsenic | 7440-38-2 | 1.26E-03 | 6.00E+00 |
| Barium* | 7440-03-93 | 5.99E-03 | 3.38E+01 |
| Benz(a)anthracene** | 56-55-3 | 8.55E-06 | 1.03E-02 |
| Benzene | 71-43-2 | 1.98E-01 | 1.41E+03 |
| Benzo(a)pyrene** | 50-32-8 | 2.29E-05 | 2.76E-02 |
| Benzo(b)fluoranthene** | 205-99-2 | 1.07E-06 | 1.29E-03 |
| Benzo(g,h,i)perylene * | 191242 | 7.17E-07 | 3.38E-03 |
| Benzo(k)fluoranthene** | 207-08-9 | 6.28E-06 | 7.60E-03 |
| Beryllium | 7440-41-7 | 2.33E-04 | 1.13E+00 |
| 1,3-Butadiene | 106-99-0 | 7.89E-01 | 6.05E+03 |
| Cadmium | 7440-43-9 | 1.38E-03 | 7.00E+00 |
| Chlorobenzene | 108907 | 2.10E-05 | 2.26E-02 |
| Chromium (Hexavalent) | 18540-29-9 | 8.37E-04 | 2.37E+00 |
| Chromium (Total)* | 7440473 | 7.80E-04 | 3.25E+00 |
| Chrysene* | 218019 | 8.22E-04 | 6.50E+00 |
| Cobalt* | 7440-04-84 | 3.07E-04 | 2.15E+00 |
| Copper | 74400508 | 1.29E-02 | 7.88E+01 |
| Cresols | 1319773 | 7.71E-04 | 6.09E+00 |
| Cumene* | 98828 | 4.64E-02 | 4.03E+02 |
| Cyclohexane* | 110827 | 5.69E-01 | 4.98E+03 |
| Dibenz(a,h)anthracene** | 226-36-8 | 2.45E-06 | 2.96E-03 |
| Ethylbenzene | 100-41-4 | 4.71E-01 | 4.01E+03 |
| Ethylene* | 74851 | 2.74E-01 | 2.43E+03 |
| Ethylene Glycol* | 107211 | 1.63E-04 | 2.05E-02 |
| Fluoranthene* | 206440 | 3.00E-05 | 2.31E-01 |

## TABLE 3-6 (Concluded)

| CHEMICAL | CAS NO. | Emissions (lbs/hr) | Emissions (lbs/yr) |
|---|---|---|---|
| Fluorene[(2)] | 86737 | 2.52E-05 | 1.51E-01 |
| Formaldehyde | 50-00-0 | 2.54E-01 | 1.41E+03 |
| Hexane | 110-54-3 | 1.52E+00 | 1.30E+04 |
| Hydrogen Chloride | 7647-01-0 | 1.97E-02 | 2.10E+01 |
| Hydrogen Sulfide | 2148878 | 4.06E-01 | 2.30E+03 |
| Indeno(1, 2, 3-c,d)pyrene[(3)] | 193395 | 1.27E-03 | 9.84E+00 |
| Lead | 7439-92-1 | 4.49E-03 | 1.90E+01 |
| Manganese | 7439-96-5 | 6.55E-02 | 4.43E+02 |
| Mercury | 7439-97-6 | 7.45E-04 | 3.63E+00 |
| Methanol | 67-56-1 | 4.95E-01 | 4.34E+03 |
| Methyl Ethyl Ketone (MEK) | 78933 | 4.36E-03 | 3.40E+01 |
| 2-Methylnaphthalene[(2)] | 91576 | 2.16E-05 | 1.48E-01 |
| Methyl Tert-Butyl Ether (MTBE) | 1634-04-4 | 9.73E-01 | 8.52E+03 |
| Naphthalene | 91-20-3 | 1.95E-01 | 1.66E+03 |
| Nickel | 7440-02-0 | 1.38E-01 | 8.58E+01 |
| PAHs | 1150 | 1.61E-03 | 3.95E+00 |
| Perchloroethylene | 127-18-4 | 1.26E-01 | 1.11E+03 |
| Phenanthrene[(2)] | 127-18-4 | 4.53E-05 | 2.90E-01 |
| Phenol | 108-95-2 | 2.32E-03 | 6.85E+00 |
| Propionaldehyde | 123386 | 2.51E-03 | 1.95E+01 |
| Phosphorous | 7723140 | 1.81E-02 | 1.27E+02 |
| Propylene | 115071 | 3.06E-01 | 2.20E+03 |
| Pyrene[(2)] | 129000 | 1.86E-05 | 1.20E-01 |
| Selenium | 7782-49-2 | 2.05E-03 | 1.20E+01 |
| Silver[(2)] | 7440224 | 8.70E-04 | 3.42E+00 |
| Sodium Hydroxide | 1310-93-2 | 1.89E-05 | 3.35E-03 |
| Styrene | 100-42-5 | 3.15E-03 | 2.53E+01 |
| Sulfuric Acid | 7664-93-9 | 1.21E+01 | 9.53E+04 |
| Thallium[(2)] | 7440280 | 2.60E-03 | 8.75E+00 |
| 1,1,1-Trichloroethane | 71556 | 2.11E-01 | 1.85E+03 |
| 1,2,4-Trimethylbenzene[(2)] | 96636 | 1.17E+00 | 1.01E+04 |
| 2,2,4-Trimethylpentane[(2)] | 540841 | 9.76E-01 | 8.45E+03 |
| Toluene | 108-88-3 | 1.28E+00 | 1.06E+04 |
| Vanadium | 7440622 | 3.47E-03 | 2.68E+01 |
| Xylenes | 1210 | 2.44E+00 | 3.73E+04 |
| Zinc[(2)] | 7440-66-6 | 3.64E-02 | 2.01E+02 |

(1) CAS No. = Chemical Abstract Service Number
(2) Emissions were calculated; however, health data do not exist for these compounds. Therefore, health risk calculations using these compounds were not completed.
(3) These compounds are all considered to be PAHs and evaluated as PAHs herein.

Using the emission inventory in Table 3-6, the HRA was prepared to assess the individual excess cancer risk at various locations surrounding the Wilmington Plant, 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 8 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 Wilmington Plant. Figure 3-2 shows the locations of the existing MEIR and MEIW. Based on the results of the HRA, the cancer risk associated with exposure to TAC emissions from the existing Wilmington Plant operations for the MEIW and MEIR were estimated to be $1.56 \times 10^{-6}$ (about 2 per million) and $8.56 \times 10^{-6}$ (about 9 per million), respectively (see Table 3-7).

**TABLE 3-7**

**SUMMARY OF CANCER RISK**

| EXPOSURE PATHWAY | Maximum Exposed Individual Resident | Maximum Exposed Individual Worker |
|---|---|---|
| Inhalation | $7.62 \times 10^{-6}$ | $1.39 \times 10^{-6}$ |
| Dermal | $7.55 \times 10^{-8}$ | $1.39 \times 10^{-8}$ |
| Soil Ingestion | $2.94 \times 10^{-7}$ | $5.14 \times 10^{-8}$ |
| Water Ingestion | 0.00 | 0.00 |
| Ingestion of Home Grown Produce | $5.76 \times 10^{-7}$ | $1.06 \times 10^{-7}$ |
| Ingestion of Animal Products | 0.00 | 0.00 |
| Ingestion of Mother's Milk | 0.00 | 0.00 |
| **Total Cancer Risk** | **$8.56 \times 10^{-6}$** | **$1.56 \times 10^{-6}$** |

Existing cancer risk calculations also were provided for a number of sensitive populations near the Wilmington Plant including schools, daycare centers, hospitals, and retirement homes. The existing peak risk at a sensitive population was estimated to be $6.8 \times 10^{-6}$ or approximately six per million at the Hawaiian Avenue Elementary School. This risk estimate is overly conservative as it is based on a 70-year continuous exposure.

The HRA also included analysis of existing acute and chronic non-carcinogenic health impacts. The potential for chronic/acute health effects was evaluated by comparing the reference

Figure 3-1 goes here

Figure 3-2 goes here

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 0.977 and 0.074, respectively. Figure 3-2 shows the locations of the maximum acute and chronic hazard indices.

## 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. Tosco 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 State 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 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 by December 31, 2002. As part of the Executive Order, on December 9, 1999, CARB adopted new gasoline specifications, which are known as RFG Phase 3 requirements (see Table 2-2). The proposed project is being proposed to comply with these RFG Phase 3 requirements. Tosco already has initiated modifications to phase out MTBE, which were previously analyzed in a negative declaration (SCH No. 20005115; SCAQMD, 2000b).

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" (cancer risk 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 sources air pollution and limited authority over mobile sources. The SCAQMD and the Southern California Association of Governments jointly are 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 state 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, Regulation XVII – Prevention of Significant Deterioration, Regulation XX – Regional Clean Air Incentives Market (RECLAIM) Program, and Regulation XXX – Title V Permits.

## GEOLOGY/SOILS

### Topograghy and Soils

The Wilmington Plant is located near the eastern slopes of the Palos Verdes Peninsula. Elevations at the Wilmington Plant vary from about 30 feet above mean sea level along the southern boundary to about 150 feet near the western portions.

The Tosco Wilmington Plant is located within the northwestern portion of the Peninsular Range Province, a major physiographic and tectonic province characterized by a prevailing northwesterly orientation of structural geologic features. This general area is a northwest-trending lowland plain approximately 50 miles long and 20 miles wide. Unconsolidated and semi-consolidated Quaternary marine and nonmarine sediments fill the basin. Sediments are underlain by volcanic rocks and marine sedimentary rocks of early Pleistocene, Pliocene and Miocene age. The lowland surface of the Los Angeles Basin slopes gently southward and westward to the Pacific Ocean.

The soils in the southwestern Los Angeles Basin can be grouped into the following categories: residual soils old valley-fill and coastal plain soils, and recent alluvial-fan and flood plain soils. The Ramona and Yolo soils underlie the Wilmington Plant. The Ramona soils are unconsolidated water-laid deposits that include loam, fine sandy loam and clay loam. The Yolo soils consist of recent alluvium washed from sedimentary rocks that include loam and sandy loam.

In 1985, the RWQCB adopted Order 85-17 requiring Tosco (Unocal at the time) (and 14 other local refineries) to conduct subsurface investigations of soil and ground water. Areas of soil contamination have been detected at the site and remediated, as appropriate. CEQA §21092.6 requires the lead agency to consult the lists compiled pursuant to §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 §65962.5. However, the SCAQMD has been informed that the Wilmington Plant is included on a list compiled by CalEPA under Government Code §65962.5, dated May 6, 1999. The SCAQMD was advised that the Wilmington Plant 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). For sites which are listed pursuant to Government Code §65962.5, the following information is requested:

| | |
|---|---|
| Applicant: | Tosco Los Angeles Refinery - Wilmington Plant |
| Address: | 1660 West Anaheim Street, Wilmington, California 90744 |
| Phone: | (310) 952-6000 |
| Address of Site: | 1660 West Anaheim Street, Wilmington, California 90744 |
| Local Agency: | Wilmington, City of Los Angeles |
| Assessor's Book: | Parcel numbers 7412-22-6, 7412-22-8, 7412-22-9, 7412-22-10, 7412-24-2, and 7412-24-3. |
| List: | See above. |
| Regulatory ID No: | R-25493 |
| Date of List: | See above. |

**Earthquake Faults**

The Los Angeles area is considered a seismically active region. The most significant potential geologic hazard at the Wilmington Plant and related facilities is estimated to be seismic shaking from future earthquakes generated by active or potentially active faults in the region. Table 3-8 identifies those faults considered important to the project sites in terms of potential for future activity. Seismic records have been available for the last 200 years, with improved instrumental seismic records available for the past 50 years. Based on a review of earthquake data, most of the earthquake epicenters occur along the San Andreas, San Jacinto, Whittier-Elsinore and Newport-Inglewood faults (Jones and Hauksson, 1986). All these faults are elements of the San Andreas Fault system. Past experience indicates that there has not been any substantial damage, structural or otherwise to the Wilmington Plant as a result of earthquakes. Table 3-9 identifies the historic earthquakes over magnitude 4.5 in Southern California, between 1915 and the present, along various faults in the region. The location of these faults are shown in Figure 3-3.

**San Andreas Fault Zone**

The San Andreas fault is located on the north side of the San Gabriel Mountains trending east-southeast as it passes the Los Angeles Basin. This fault is recognized as the longest and most active fault in California. It is generally characterized as a right-lateral strike-slip fault which is comprised of numerous sub-parallel faults in a zone over two miles wide. There is a high probability that southern California will experience a magnitude 7.0 or greater earthquake along the San Andreas or San Jacinto fault zones, which could generate strong ground motion in the project area. There is a five to 12 percent probability of such an event occurring in southern California during any one of the next five years and 47 percent chance within the same five year period (Reich, 1992).

**TABLE 3-8**

**MAJOR ACTIVE OR POTENTIALLY ACTIVE FAULTS
SOUTHERN CALIFORNIA**

| FAULT | FAULT LENGTH (Miles) | MAXIMUM CREDIBLE EARTHQUAKE | MAXIMUM ACCELERATION (Gs) | DISTANCE FROM Wilmington Plant (miles) |
|---|---|---|---|---|
| Malibu-Santa Monica-Raymond Hill | 65 | 7.5 | 0.49 | 22 |
| Newport-Inglewood | 25 | 7.0 | 0.42 | 5-6 |
| Northridge | 12 | 6.7 | 0.16 | 54 |
| Palos Verdes | 20 | 7.0 | 0.24 | 1 |
| San Andreas | 200+ | 8.25 | 0.21 | 50 |
| San Jacinto | 112 | 7.5 | 0.11 | 55 |
| San Fernando | 8 | 6.8 | 0.17 | 45 |
| Sierra Madre | 55 | 7.3 | 0.23 | 35 |
| Whittier-Elsinore | 140 | 7.1 | 0.46 | 25 |
| Elysian Park- Montebello | 15 | 7.1 | 0.27 | 25 |

G = acceleration of gravity.

Figure 3-3 goes here

**TABLE 3-9**

**SIGNIFICANT HISTORICAL EARTHQUAKES IN SOUTHERN CALIFORNIA**

| DATE | LOCATION | MAGNITUDE |
|---|---|---|
| 1915 | Imperial Valley | 6.3 |
| 1925 | Santa Barbara | 6.3 |
| 1920 | Inglewood | 4.9 |
| 1933 | Long Beach | 6.3 |
| 1940 | El Centro | 6.7 |
| 1940 | Santa Monica | 4.7 |
| 1941 | Gardena | 4.9 |
| 1941 | Torrance | 5.4 |
| 1947 | Mojave Desert | 6.2 |
| 1951 | Imperial Valley | 5.6 |
| 1968 | Borrego Mountain | 6.5 |
| 1971 | Sylmar | 6.4 |
| 1975 | Mojave Desert | 5.2 |
| 1979 | Imperial Valley | 6.6 |
| 1987 | Whittier | 5.9 |
| 1992 | Joshua Tree | 6.3 |
| 1992 | Landers | 7.4 |
| 1992 | Big Bear | 6.5 |
| 1994 | Northridge | 6.7 |
| 1999 | Hector Mine | 7.1 |

Sources: Bolt (1988), Jennings (1985), Gere and Shah (1984), Source Fault Hazard Zones in California (1988), Yanev (1974), and personnel communication with the California Division of Mines and Geology

**The Newport-Inglewood Fault Zone**

The Newport-Inglewood fault is located approximately five to six miles northeast of the Wilmington Plant and is a major tectonic structure within the Los Angeles Basin. This fault is best described as a structural zone comprising a series of echelon and sub-parallel fault segments and folds. In some cases, the faults of the Newport-Inglewood uplift have exerted considerable barrier influence upon the movement of subsurface water (DWR, 1961). Offsetting of sediments along this fault usually is greater in deeper, older formations. Displacement is less in younger formations. The Alquist-Priolo Act has designated this fault as an earthquake fault zone. The designation as an earthquake fault zone is to mitigate the hazards of fault rupture by prohibiting the building of structures across the trace of the fault. This fault poses a seismic hazard to Los Angeles (Toppozada, et al., 1988, 1989), although no surface faulting has been associated with earthquakes along this structural zone during the past 200 years. Since this fault is located within the Los Angeles Metropolitan area, a major earthquake along this fault would produce more destruction than a magnitude 8.0 on the San Andreas fault. The largest instrumentally recorded event was the 1933 Long Beach earthquake, which occurred on the offshore portion of the Newport-Inglewood structural zone with a magnitude of 6.3. A maximum credible earthquake of magnitude 7.0 has been assigned to this fault zone (Yerkes, 1985). A portion of the Newport-Inglewood fault is sometimes referred to as the Compton fault.

**Malibu-Santa Monica-Raymond Hills Fault Zone**

The Raymond Hills fault is part of the fault system that extends from the base of the San Gabriel Mountains westward to beyond the Malibu coast line. The fault has been relatively quiet, with no recorded seismic events in historic time; however, recent studies have found evidence of ground rupture within the last 11,000 years.

**The Palos Verdes Fault Zone**

The Tosco Wilmington Plant is located near and possibly adjacent to the Palos Verdes fault zone. The Palos Verdes fault extends for about 50 miles from the Redondo submarine canyon in Santa Monica Bay to south of Lausen Knoll and is responsible for the uplift of the Palos Verdes Peninsula. This fault is both a right-lateral strike-slip and reverse separation fault. The Gaffey anticline and syncline are reported to extend along the northwestern portion of the Palos Verdes hills. These folds plunge southeast and extend beneath recent alluvium east of the hills and into the San Pedro Harbor, where they may affect movement of ground water (DWR, 1961). The probability of a moderate or major earthquake along the Palos Verdes fault is low compared to movements on either the Newport-Inglewood or San Andreas faults (Los Angeles Harbor Department, 1980). However, this fault is capable of producing strong to intense ground motion (estimated magnitude 7.0) and ground surface rupture. This fault zone has not been placed by the California State Mining and Geology Board into an Alquist-Priolo special studies zone.

**Whittier-Elsinore Fault Zone**

The Whittier fault is one of the more prominent structural features in the Los Angeles Basin. It extends from Turnbull Canyon near Whittier, southeast to the Santa Ana River, where it merges with the Elsinore fault. Yerkes (1972) indicated that vertical separation on the fault in the upper Miocene strata increases from approximately 2,000 feet at the Santa Ana River northwestward to approximately 14,000 feet in the Brea-Olinda oil field. Farther to the northwest, the vertical separation decreases to approximately 3,000 feet in the Whittier Narrows of the San Gabriel River.

The fault also has a major right-lateral strike slip component. Yerkes (1972) indicates streams along the fault have been deflected in a right-lateral sense from 4,000 to 5,000 feet. The fault is capable of producing a maximum credible earthquake event of about magnitude 7.1 every 500 to 700 years.

**Sierra Madre Fault System**

The Sierra Madre fault system extends for approximately 55-60 miles along the northern edge of the densely populated San Fernando and San Gabriel valleys (Dolan, et al., 1995) and includes all faults that have participated in the Quaternary uplift of the San Gabriel Mountains. The fault system is complex and appears to be broken into five or six segments each 10 to 15 miles in length (Ehlig, 1975). The fault system is divided into three major faults by Dolan, et al. (1995), including the Sierra Madre, the Cucamonga and the Clamshell-Sawpit faults. The Sierra Madre fault is further divided into three minor fault segments the Azusa, the Altadena and the San Fernando fault segments. The Sierra Madre fault is capable of producing a 7.3 magnitude fault every 805 years (Dolan, et al., 1995).

**San Fernando Fault**

The westernmost segment of the Sierra Madre fault system is the San Fernando segment. This segment extends for approximately 12 miles beginning at Big Tujunga Canyon on the east to the joint between the San Gabriel Mountains and the Santa Susana Mountains on the west (Ehlig, 1975). The 1971 Sylmar earthquake occurred along this segment of the Sierra Madre fault system, resulting in a 6.4 magnitude fault. Dolan, et al. (1995) indicates the San Fernando fault segment is capable of producing a 6.8 magnitude fault every 455 years.

The 1994 Northridge earthquake occurred on a fault parallel to the 1971 Sylmar earthquake. However, the dip direction of the two faults is opposite. The Northridge fault dips down to the south, and the Sylmar fault dips down to the north.

**Elysian Park-Montebello System**

The Elysian Park fault is a blind thrust fault system, i.e., not exposed at the surface, whose existence has been inferred from seismic and geological studies. The system as defined by Dolan, et al. (1995) comprises two distinct thrust fault systems; 1) an east-west-trending thrust ramp located beneath the Santa Monica Mountains; and 2) a west-northwest-trending system that extends from Elysian Park Hills through downtown Los Angeles and southeastward beneath the Puente Hills. The Elysian Park thrust is capable of producing a magnitude 7.1 earthquake every 1,475 years.

**Torrance-Wilmington Fault Zone**

The Torrance-Wilmington fault has been reported to be a potentially destructive, deeply buried fault, which underlies the Los Angeles Basin. Kerr (1988) has reported this fault as a low-angle reverse or thrust fault. This proposed fault could be interacting with the Palos Verdes hills deep below the ground surface. Little is known about this fault, and its existence is inferred from the study of deep earthquakes. Although information is still too preliminary to be able to quantify the specific characteristics of this fault system, this fault appears to be responsible for many of the small to moderate earthquakes within Santa Monica Bay and easterly into the Los Angeles area. This fault itself should not cause surface rupture, only ground shaking in the event of an earthquake.

In addition to the known surface faults, shallow-dipping concealed “blind” thrust faults have been postulated to underlie portions of the Los Angeles Basin. Because there exist few data to define the potential extent of rupture planes associated with these concealed thrust faults, the maximum earthquake that they might generate is largely unknown.

**Liquefaction**

Liquefaction would most likely occur in unconsolidated granular sediments that are water saturated less than 30 feet below ground surface (Tinsley et al., 1985). Based on the latest seismic hazards maps developed under the Seismic Hazards Mapping Act, the Wilmington Plant is not located in an area of historic liquefaction (California Division of Mines and Geology, Map of Seismic Hazard Zones). Liquefaction is considered unlikely in relationship to the proposed project since the parameters required for liquefaction to occur are not evident at the sites, e.g., unconsolidated granular soils and a high water table. Ground water occurs greater than 40 feet below the surface grade, and the soils below the Wilmington Plant are not conducive to liquefaction. Based on the latest seismic hazards maps, developed under the Seismic Hazards Mapping Act, the Wilmington Plant is not located in an area of historic liquefaction (California Division of Mines and Geology, Map of Seismic Hazard Zones).

**Other Geological Hazards**

The proposed project site is not subject to landslide, mudflow, seiche, tsunami or volcanic hazards. The Wilmington Plant is protected from tsunamis by breakwaters that protect the entire port area. No other unique geological resources have been identified at the Tosco facilities (e.g., unique rock outcrops).

**Regulatory Background**

The Los Angeles General Plan includes the Seismic Safety Element. The Element serves primarily to identify seismic hazards and their location in order that they may be taken into account in the planning of future development. The Uniform Building Code is the principle mechanism for protection against and relief from the danger of earthquakes and related events.

The Seismic Hazard Zone Mapping Act (Public Resources Code §§2690 – 2699.6) was passed by the California legislature in 1990 following the Loma Prieta earthquake. The Act required that the California Division of Mines and Geology (DMG) develop maps that identify the areas of the state that require site specific investigation for earthquake-trigger landslides and/or potential liquefaction prior to permitting most urban developments. The act directs cities, counties and state agencies to use the maps in their land use planning and permitting processes.

The local governments are responsible for implementing the requirements of the Seismic Hazards Mapping Act. The maps and guidelines are tools for local governments to use in establishing their land use management policies and in developing ordinances and review procedures that will reduce losses from ground failure during future earthquakes. Where seismic hazard maps have been prepared by the DMG, cities and counties must:

- Determine the need for geotechnical reports prior to approving a development project (PRC §2697).
- Approve the site-investigation reports prior to issuing development permits (PRC §2697).
- Provide a copy of the site-specific report, including any mitigation measures imposed, to the state geologist within 30 days of approval (PRC §2697).
- Provide a copy of any waiver request granted, along with report and commentary, to the state geologist within 30 days.
- Collect building fees and remit to the Department of Conservation.
- Take the hazard map information into account when adopting or revising the safety elements of general plans and land use planning or permitting ordinances (PRC §2699).

## HAZARDS & 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 potentially 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 Tosco Refining Company’s Reformulated Fuels Project (see Volume III).

Shipping, handling, storing, and disposing of hazardous materials inherently poses a certain risk of a release to the environment. The regulated substances handled by the Refinery include chlorine, and ammonia. The Refinery also handles petroleum products including propane, butane, isobutane, MTBE, 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 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.

The hazards can be defined in terms of the distance that a release may travel or the number of individuals of the public potentially affected 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 most probable natural event that would lead to a “worst-case” event would be a major earthquake. Seismic hazards affecting the Wilmington area and mitigation measures to minimize impacts (e.g., compliance with the Uniform Building Codes) are discussed in Chapter 3, Geology. The hazards of an earthquake on the facility are addressed in this section.

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:

**Toxic gas clouds**

Toxic gas clouds are releases of volatile chemicals (e.g., anhydrous ammonia, chlorine, and hydrogen sulfide) that could form a cloud and migrate off-site, thus exposing individuals. “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.

**Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases)**

The rupture of a storage tank containing a flammable gaseous material (like propane), without immediate ignition, can result in a vapor cloud explosion. The “worst-case” upset assumes that a release occurs and produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

### Thermal Radiation

Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. 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.

### 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. An explosion could cause impacts to individuals and structures in the area due to overpressure.

A summary of existing hazards at the Refinery associated with the units at the Refinery that are a part of the proposed project (being modified as part of the CARB RFG Phase 3 project) is shown in Table 3-10.

**TABLE 3-10**

**SUMMARY OF EXISTING HAZARDS(1)**

| Process Areas | Types of Hazards Found in the Area |
|---|---|
| Alkylation Unit<br>Alkylation – Refrig.<br>Acid Plant<br>Butamer Unit | Breach of liquid line or vessel resulting in:<br>Pool fire |
| | Breach of flashing liquid line or vessel resulting in:<br>Flash fire, VCE(2), pool fire, torch fire, toxic cloud (hydrogen sulfide and sulfuric acid) |
| | Breach of vapor line or vessel resulting in:<br>Torch fire, VCE, or toxic cloud (hydrogen sulfide) |
| | BLEVE(2) of pressurized liquid accumulator |
| Storage Tanks | Breach of atmospheric storage resulting in:<br>Tank fire, dike fire |
| | Breach of pressurized storage resulting in:<br>flash fire, VCE, or torch fire |
| | BLEVE of pressurized storage tank |
| Product Transfer<br>Truck Transfer<br>Railcar Transfer | Breach of low pressure piping resulting in:<br>Pool fire |
| | Breach of flashing liquid piping resulting in:<br>Flash fire, VCE, torch 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) VCE = Vapor cloud explosion. BLEVE = Boiling liquid expanding vapor explosion.

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 were not in place.

**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 3-11. This information was summarized from the Los Angeles County Hazardous Waste Management Plan (Los Angeles County, 1988).

**TABLE 3-11**

**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.

In the study completed by the U.S. EPA, cylinders, cans, glass, plastic, fiber boxes, tanks, metal drum/parts, and open metal containers were identified as usual container types. For each container type, the expected fractional release en route was calculated. The study concluded that the release rate for tank trucks is much lower than for any other container type (Los Angeles County, 1988).

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.

The actual occurrence of an accidental release of a hazardous material 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 (CCR Title 19, Division 2, Chapter 4.5 or the CalARP requirements) hazardous materials, e.g., anhydrous ammonia, would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Ammonia is currently used and transported to the Wilmington Plant. 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 must comply with which serve to minimize the potential impacts associates 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 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 Wilmington Plant. Tosco is also required to comply with the U.S. EPA's Emergency Planning and Community Right-to-Know Act (EPCRA).

The Hazardous Materials Transportation 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 Act requires that carriers report accidental releases of hazardous materials to the Department of Transportation at the earliest practical moment (49 Code of Federal Regulations 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.

## 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 3-4.

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. Quiet suburban areas typically have noise levels in the range of 40-50 dBA, while those along arterial streets are in the 50-60+ dBA range. Normal conversational levels are in the 60-65 dBA range, and ambient noise levels greater than that can interrupt conversations (City of Carson, 1995).

### Existing Noise Levels

The vicinity of the proposed Wilmington Plant is an urban environment characterized by extensive development that includes industrial, commercial, residential, recreational, and transportation-related land uses. Major contributors to the ambient noise levels in the general vicinity of the Wilmington Plant include the following:

- Vehicular traffic on the Harbor (110) Freeway and Anaheim Street;

Figure 3-4 goes here

- The industrial facilities which include other storage facilities, a roofing materials plant, warehouses and port-related uses;
- The numerous port-related activities such as vessel traffic and loading/unloading of cargo.

Traffic is a major source of noise in the area. The Harbor 110 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 freeway is about 70 dBA.

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 Wilmington Plant. The major noise sources within the Wilmington Plant are associated with the main processing units. Noise surveys conducted within the confines of and near the processing units of the Wilmington Plant 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 Wilmington Plant are not elevated but are located near ground level.

The Wilmington Plant is surrounded by industrial, commercial, transportation, recreational, school, and residential land uses. To the north across Anaheim is a recreational area comprised of a park, lake, and golf course. Harbor College is located adjacent to the recreational area. The nearest residences are located at the eastern Wilmington Plant boundary. Also to the east of the Wilmington Plant are commercial areas, the Harbor 110 Freeway and residential areas. South of the Wilmington Plant is a commercial/industrial area. To the west of the Wilmington Plant is the Naval reservation which includes military housing, although most of the housing units appear to be abandoned.

The Tosco Wilmington Plant is located in an M3-1 zoned (heavy industrial) area, as established by the City of Los Angeles. Noise readings (the locations of which are numbered in Figure 3-5) were taken in the area surrounding the Wilmington Plant in September 2000. The location of the noise readings are identified in Figure 3-5 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.

The ambient noise readings indicate that the noise levels in the vicinity of the Wilmington Plant are 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 Wilmington Plant generally range from 60 to 70 dBA. Noise levels at many of the locations near the Wilmington Plant are dominated by traffic noise including traffic on Anaheim Street, Gaffey Street and the Harbor 110 Freeway. Noise from

Figure 3-5 goes here

## TABLE 3-12

## NOISE LEVEL MEASUREMENT LOCATIONS

| LOCATION | DESCRIPTION |
|---|---|
| 1 | At the corner of Anaheim Street and "I" Street, near closest house to the Wilmington Plant. The Wilmington Plant is located southwest of this location. The existing noise level at this location is influenced mainly by traffic on Anaheim Street. |
| 2 | Within the Harbor Regional Park, approximately 1,500 feet north of Anaheim Street. The current ambient noise levels are mainly influenced by traffic on Vermont Avenue. |
| 3 | Approximately 1,000 feet north of Anaheim Street and 200 feet west of the 110 Harbor Freeway within the Los Angeles Harbor College campus. The existing noise level at this location is influenced by traffic on the Harbor Freeway and Figueroa Street, and school activities. |
| 4 | Approximately 1,000 feet south of Palos Verdes Drive and 2,000 feet west of Gaffey Street within the military housing community. The existing noise level at this location is influenced mainly by traffic on major roads (Anaheim and Gaffey Streets). Noise from the Wilmington Plant is audible at this location especially during the nighttime when the traffic volume is low. Noise from the ballpark facilities is also audible. |
| 5 | Outside of the Defense Energy Office at 3171 Gaffey Street. This location represents the noise levels outside the Wilmington Plant's western property line. The existing noise levels at this location are influenced mainly by traffic on Gaffey Street. Noise from the Wilmington Plant is audible at this location, especially during the nighttime when traffic on Gaffey Street is low. |
| 6 | Approximately 50 feet from the eastern boundary of the Wilmington Plant on Emden Street. Residences are located immediately east of this location. The ambient noise level are primarily influenced by the Wilmington Plant, the noise from which is clearly audible, and the 110 Freeway. |
| 7 | At the corner of Figueroa Street and "F" Street. Residential areas are located east and a commercial area is located west of this location. The ambient noise levels at this site is primarily influenced by traffic on Figueroa Street and the 110 Freeway. |

## TABLE 3-13

## SAMPLING RESULTS
## BACKGROUND AMBIENT NOISE LEVELS, dBA

| LOCATION | NOISE LEVELS (dBA) | | | | |
|---|---|---|---|---|---|
| | Morning | Afternoon | Evening | Nighttime | CNEL |
| 1 | 64.6 | 66.6 | 66.2 | 60.2 | 68.1 |
| 2 | 54.8 | 54.0 | 54.4 | 50.6 | 57.2 |
| 3 | 67.6 | 66.6 | 66.2 | 62.0 | 69.4 |
| 4 | 61.2 | 55.6 | 50.8 | 53.4 | 59.0 |
| 5 | 70.8 | 60.2 | 60.4 | 51.6 | 64.5 |
| 6 | 63.2 | 63.6 | 61.2 | 60.2 | 62.1 |
| 7 | 67.6 | 65.0 | 61.6 | 55.8 | 66.3 |

* See Figure 3-5 for noise reading locations.

traffic contributes to the higher noise readings at the Los Angeles Harbor College (Location 3) and the residential area near "I" Street and Anaheim Street (Location 1).

The closest residential area to the Wilmington Plant is located along the eastern boundary (Location 6). Noise levels at this location are primarily influenced by the Wilmington Plant and also the Harbor 110 Freeway. The overall ambient noise levels during the night are lower (generally about 5-6 dBA) due to reduced traffic volumes. The Wilmington Plant operations are continuous during a 24-hour period; i.e., processing equipment is not shut down during the night, weekends, or holidays. The Wilmington Plant's relative contribution to ambient noise during the night, therefore, is greater since the number of other noise sources in the area are reduced. For example, the noise contribution at Location 6 is primarily associated with operation of the Wilmington Plant (as it is located at the eastern boundary of the Wilmington Plant) where the noise levels range from 60 to 64 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 Wilmington Plant. 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 (dBA)***

| ZONE | DAY | NIGHT |
|---|---|---|
| Residential | 50 | 40 |
| P, PB, CR, C1, C2, C4, C5, CM | 60 | 55 |
| M1, MR1, MR2 | 65 | 65 |
| 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.

## TRANSPORTATION/TRAFFIC

### Regional Transportation Network

The Wilmington Plant is located just off the Harbor 110 Freeway on Anaheim Street. The Harbor 110 Freeway is a major north-south freeway and provides the Tosco Wilmington Plant access to the southern California region and beyond. The Harbor 110 Freeway provides access to other major freeways including the San Diego 405 Freeway, the Riverside 91 Freeway, the Santa Ana 5 Freeway, and the Santa Monica 10 Freeway, among others.

Major streets in the Wilmington area include Anaheim Street, Pacific Coast Highway, Sepulveda Boulevard and Alameda Street. Alameda Street is being 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 Wilmington Plant area 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 Wilmington Plant.

The Wilmington Plant is located near the Port of Los Angeles which provides a mode for transportation of goods and materials via marine vessels.

### Local Traffic Conditions

The Tosco Wilmington Plant is located at 1660 West Anaheim Street in the community of Wilmington, California, approximately one-quarter mile west of the Harbor 110 Freeway. The Wilmington Plant occupies about 425 acres and is generally located between Anaheim Street on the north, Gaffey Street on the west, and the Harbor 110 Freeway on the south and east (see Figure 3-6). The Wilmington Plant currently employs about 425 full-time employees. The predominate route used to reach the site is to/from the Harbor 110 Freeway at Anaheim Street.

The Harbor 110 Freeway is a north-south freeway that carries about 84,000 vehicles per day in the vicinity of Anaheim Street. Anaheim street is an east-west, four lane divided roadway that carries about 20,000 to 24,000 vehicles per day. Gaffey Street is a north-south, four lane divided roadway that carries about 24,000 vehicles per day. Figueroa Street is a north-south two to four lane divided roadway that parallels the eastside of the Harbor 110 Freeway.

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.

A LOS analysis was completed for local intersections in the area to determine the existing traffic conditions (see Table 3-15). The locations of these intersections are shown in Figure 3-6. The detailed traffic analysis is included as Appendix C herein.

**TABLE 3-15**

**EXISTING LEVEL OF SERVICE**

| INTERSECTION | AM LOS | PEAK HOUR V/C | PM LOS | PEAK HOUR V/C |
|---|---|---|---|---|
| Figueroa St./Anaheim St. | D | 0.855 | B | 0.654 |
| Figueroa Place/Anaheim St. | C | 0.789 | D | 0.812 |
| Figueroa St. and “I” St./110 on-ramp | D | 0.875 | A | 0.560 |
| Figueroa St. and “G” St./110 off-ramp | A | 0.320 | A | 0.328 |
| Figueroa Pl. and “I” St./ 110 off-ramp | A | 0.466 | D | 0.841 |
| Figueroa Pl. and 110 on-ramp/G St. | A | 0.288 | A | 0.303 |
| Frigate Ave and “C” Street/110 off-ramp | A | 0.416 | A | 0.573 |
| John S. Gibson truck entry/110 ramps | A | 0.583 | A | 0.442 |
| John S. Gibson and Channel St. | C | 0.776 | B | 0.612 |
| 76 Products Lane and Anaheim St. | A | 0.505 | A | 0.439 |
| Gaffey St. and Channel St. | C | 0.778 | C | 0.788 |
| Gaffey St./PalosVerdes Dr. No./ Normandie/Vermont/Anaheim St. | C | 0.720 | B/C | 0.700 |

Figure 3-6 goes here

Table 3-15 indicates that the LOS analysis for the morning peak hour shows free flowing traffic conditions (A-C) at most intersections. The exceptions to this are that the Figueroa Street/Anaheim Street and Figueroa St. and “I” St./110 on-ramp show an LOS D, which is typical for a metropolitan area street system.

The LOS analysis for the evening peak hours shows similar traffic conditions as the morning peak hour. Most intersections show free flowing traffic conditions with LOS between A and C. The exceptions to this are the Figueroa Place/Anaheim Street and Figueroa Place and “I” Street/110 off ramp which show an LOS D.

**Regulatory Background**

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.

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 Wilmington Plant are in compliance with this policy. The City has prepared a Transportation Demand Management (TDM) program for the Wilmington area 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) encourage 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).