CHAPTER 3.0

POTENTIAL ENVIRONMENTAL IMPACTS

3.1 LAND USE AND PLANNING

3.1.1 Significance Criteria

Land use and planning impacts will be considered significant if the project conflicts with the land use and zoning designations established by the local cities, as well as the County, regional, and State plans and policies.

3.1.2 Environmental Setting and Impacts

The Tosco Wilmington Plant is located in the community of Wilmington, which is part of the City of Los Angeles. The Wilmington Plant consists of approximately 400 acres and is located in Los Angeles County at 1660 West Anaheim Street, Wilmington, California. The Wilmington Plant is zoned by the City of Los Angeles as M3-1 (heavy industrial). The eastern part of the Wilmington Plant borders a residential area, a Genstar roofing materials plant, and a portion of the Harbor 110 Freeway. The northern portion of the site borders Harbor Lake Park, Harbor College, Harbor Golf Course, and a small residential area, the western part of the site borders Gaffey Street including a firing range, vacant fields, recreational fields, and a U.S. Navy fuel storage facility. Finally, the southern portion of the site shares a border with a vacant property formerly a fuel blending facility belonging to Western Fuels.

The Tosco Marine Terminal consists of ~~13.5 acres~~ approximately 18 acres and is located in Los Angeles County at Berths 148 through 151, Port of Los Angeles, California. The terminal is zoned ~~M3-1 (heavy industrial)~~ (Q)M3 (qualified commercial/industrial: liquid bulk) by the City of Los Angeles. The facility is located in an industrialized area and involves shipping and storage activities consistent with other Port activities. The Marine Terminal is located on a peninsula bounded by the Los Angeles Harbor West Basin and Slip No. 1 on the west and east, respectively. Warehouses, parking lots, and ship berths are located along the northern property line of the Marine Terminal.

The Tosco Los Angeles Terminal is located at 13500 South Broadway in Los Angeles, California (see Figure 1). The Terminal is zoned M1 (industrial). The Terminal is located south of downtown Los Angeles, in the south central portion of Los Angeles County, near the Harbor 110 and 91 Freeway interchange. The area surrounding the terminal contains commercial and industrial land uses. A residential area is located about 600 feet from the facility.

The Tosco Torrance Tank Farm is located at 2650 West Lomita Boulevard, Torrance, California. The tank farm is zoned N2 – heavy manufacturing by the City of Torrance. The tank farm is located in the southern portion of Los Angeles County, towards the Palos Verdes peninsula and

near the Torrance airport. The tank farm is located in a mixed industrial, commercial and residential area.

The Tosco Colton Terminal – East is located at 271 East Slover Avenue, Rialto, California. The Colton Terminal – West is located adjacent to the east terminal at 2301 South Riverside Avenue, Bloomington, California. Both terminals are zoned H – heavy industrial by the City of Rialto and are located in an industrial area.

The proposed project will be located within the existing boundaries of each affected facility including the Wilmington Plant, Marine Terminal, Torrance Tank Farm, Los Angeles Terminal and Colton Terminal in Southern California. Consequently, all construction activities and new facilities will be located within the confines of these facilities. No new property will be acquired as part of this project. The new equipment and minor modifications to existing equipment are consistent with the existing land uses in the vicinity of the Wilmington Plant, Marine Terminal, the Torrance Tank Farm and the Los Angeles and Colton Terminals, which are for the most part highly industrialized areas. The components of the project are consistent with the zoning in the areas, which is industrial or heavy industrial. Thus, no significant impacts to land use or zoning are expected to occur during construction of the proposed project. The proposed project will not require any new conditional use permits or modifications to any existing conditional use permits.

Operation of the proposed project will not alter existing land uses at any of the Tosco facilities and will not conflict with the land use patterns delineated by the local cities. All operations will occur within the confines of the existing facilities so that no changes in land use are expected. The proposed new facilities are expected to be consistent with the existing zoning and land uses, which are currently developed within industrial areas. Therefore, the proposed project is not expected to create significant impacts on land use and will not affect potential future uses of adjacent undeveloped land.

The proposed project will occur within heavy industrial areas where there are no agricultural resources or operations on or near the project s ite. The proposed project also will occur within the confines of the existing Tosco facilities (Refinery, Tank Farm and various Terminals) and will not disrupt or divide an established community. Therefore, no significant impacts to land use are expected.

3.1.3 Mitigation Measures

No mitigation measures are required for the construction/operation of the proposed project since no significant impacts to land use are expected.

3.2 POPULATION AND HOUSING

3.2.1 Significance Criteria

The impacts of the proposed project on population and housing will be considered significant if the following criteria are exceeded:

The population of the local cities exceeds the General Plan forecasts.

The demand for temporary or permanent housing exceeds the existing supply.

The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

3.2.2 Environmental Setting and Impacts

The proposed project would require modifications to an existing refinery and distribution system in an urbanized area and will not involve an increase, decrease or relocation of population. Similar to construction of the Phase I and II Reformulated Fuels Projects, labor for construction is expected to come from the existing labor pool in Southern California. Operation of the proposed project is not expected to require any new permanent employees at the Wilmington Plant, Marine Terminal, Torrance Tank Farm, Los Angeles Terminal, or Colton Terminal. Therefore, construction and operation of the proposed project is not expected to have significant impacts on population or housing or exceed the growth projections contained in any adopted plans.

3.2.3 Mitigation Measures

No mitigation measures are required for the construction/operation of the project since no significant impacts to population and housing are expected.

3.3 GEOLOGY AND SOIL

3.3.1 Significance Criteria

The impacts on the geological environment will be considered significant if any of the following criteria apply:

Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.

Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.

Substantial alteration of topography can result in changes, which would accelerate wind or water erosion of soils.

Generate soil contamination due to site activities, which may cause significant health impacts or which will not be handled in accordance with applicable regulations.

Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, seiche or tsunami.

Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

3.3.2 Environmental Setting and Impacts

Earthquakes

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 3-1 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 Refinery as a result of earthquakes. Table 3-2 identifies the historic earthquakes over magnitude 4.5 in Southern California, between 1915 and the present, along various faults in the region.

TABLE 3-1

MAJOR ACTIVE OR POTENTIALLY ACTIVE FAULTS
SOUTHERN CALIFORNIA

FAULT	FAULT LENGTH (Miles)	MAXIMUM CREDIBLE EARTHQUAKE	MAXIMUM ACCELERATION (Gs)	~~DISTANCE FROM SITE (miles)~~
Malibu-Santa Monica-Raymond Hill	65	7.5	0.49	~~15~~
Newport-Inglewood	25	7.0	0.42	~~3-4~~
Northridge	12	6.7	0.16	~~54~~
Palos Verdes	20	7.0	0.24	~~1-2~~
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.

TABLE 3-2

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.

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).

The Newport-Inglewood Fault Zone: The Newport-Inglewood fault is located approximately three to four miles northeast of the Carson 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. The faults of the Newport-Inglewood uplift in some cases exerting 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 building 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. It is estimated that this portion of the fault is capable of producing earthquakes of magnitude 6.8 (Triad, 1995).

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 (Triad, 1995).

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 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 7.0 every 500 to 700 years.

Sierra Madre Fault System: The Sierra Madre fault system extends for approximately 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 at depth. 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.

No faults or fault-related features are known to exist within any of the project sites. The sites are not located in any Alquist-Priolo Earthquake fault zone and are not expected to be subject to significant surface fault displacement. Therefore, no significant impacts to the proposed project facilities are expected from seismically-induced ground rupture. No significant damage has occurred to the subject Tosco facilities as a result of previous earthquakes in Southern California over the life of the facilities.

Based on the historical record, it is highly probable that earthquakes will affect the Los Angeles region in the future. Research shows that damaging earthquakes will occur on or near recognized faults which show evidence of recent geologic activity. The proximity of major faults to the Wilmington Plant, Marine Terminal, Torrance Tank Farm, and the distribution Terminals increases the probability that an earthquake may affect the Tosco facilities. There is the potential for damage to the new structures in the event of an earthquake. Impacts of an earthquake could include structural failure, spill, etc. The hazards of a release during an earthquake are addressed in the "Hazards" section below.

New structures at each site must be designed to comply with the Uniform Building Code Zone 4 requirements since the proposed project is located in a seismically active area. The local cities are responsible for assuring that the proposed project complies with the Uniform Building Code as part of the issuance of the building permits and can conduct inspections to ensure compliance. The Uniform Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage.

The Uniform Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The Uniform Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site.

Tosco shall obtain building permits, as applicable, for all new structures at the site. Tosco shall submit building plans to the appropriate cities for review. Tosco must receive approval of all building plans and building permits to assure compliance with the latest Building Code adopted by the cities or counties prior to commencing construction activities.

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, Torrance Tank Farm, and Los Angeles Terminal sites are 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, Torrance Tank Farm, and Los Angeles Terminal sites consist of soils, which are not conducive to liquefaction.

Based on the latest seismic hazards maps developed under the Seismic Hazards Mapping Act, most of the Wilmington Plant, Torrance Tank Farm, and the Los Angeles Terminal sites are not located in an area of historic liquefaction (California Division of Mines and Geology, Map of Seismic Hazard Zones). The Marine Terminal site is located in an area of historic liquefaction (California Division of Mines and Geology, Map of Seismic Hazard Zones). It should be noted that in past earthquakes liquefaction has not been observed at the Marine Terminal. The Seismic Hazard Map for the Vicinity of the Colton Terminal has not yet been completed. The issuance of building permits from the local agency will assure compliance with the Uniform Building Code requirements. Therefore, no significant impacts from liquefaction are expected.

Erosion

During construction of the proposed project, the possibility exists for temporary erosion resulting from excavation and grading activities. These activities are expected to be minor since the proposed project will occur within already developed facilities in areas with generally flat topography. The proposed project involves the addition of new equipment to existing facilities so major grading/trenching is not expected to be required and is expected to be limited to minor foundation work and minor trenching for pipeline modifications. Therefore, no significant impacts related to soil erosion are expected. No significant change in topography is expected because little grading/trenching is required that could substantially increase wind erosion or runoff from affected sites. Relative to operation, no change in surface runoff is expected because surface conditions will remain relatively unchanged. Further, surface runoff is minimized because surface runoff at all facilities is typically captured, treated, and released to the public sewerage system or storm drain system.

Other Geological Hazards

The proposed project sites are not subject to landslide, mudflow, seiche, tsunami or volcanic hazards since the sites are flat and not near volcanic activity. The Marine Terminal is protected from tsunamis by breakwaters that protect the entire port area. Other facilities are not located near the ocean or inland aquatic systems. No other unique geological resources have been identified at the Tosco facilities (e.g., unique rock outcrops).

3.3.3 Mitigation Measures

No mitigation measures are required for the construction/operation of the project since no significant impacts to geology are expected.

3.4 WATER

3.4.1 Significance Criteria

Potential impacts on water resources will be considered significant if any of the following criteria apply:

Water Quality:

The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.

The project will cause the degradation of surface water substantially affecting current or future uses.

The project will result in a violation of NPDES permit requirements.

The project creates a substantial increase in mass inflow to public wastewater treatment facilities.

The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.

The project results in alterations to the course or flow of floodwaters.

Water Demand:

The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water.

The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.

The project increases demand for water by more than five million gallons per day.

3.4.2 Environmental Setting and Impacts

Surface Water

At the Wilmington Plant the storm water drains to the Oil Recovery Unit for treatment and eventual discharge to the sanitary sewer under the conditions of the City of Los Angeles Bureau of Sanitation Industrial Wastewater Discharge.

Storm water in process areas is collected at the Marine Terminal where it is contained and pumped to the Wilmington Plant Recovered Oil System.

At the Torrance Tank Farm, each tank containment basin drains to a storm water retention basin. From the basin, storm water goes to a concrete sump that is designed to drain water from the bottom and retain oil or sheen that might be present. The water is visually inspected for contaminants prior to being discharged to a City of Torrance storm water drain.

The Los Angeles Terminal is graded to direct storm water into drains that connect to the facility's storm water oil/water separator. Treated storm water is discharged to the Los Angeles County Department of Public Works storm water system.

The Colton Terminal is graded to direct surface runoff into drains that connect to Kinder-Morgan's neighboring facility for discharge through their storm water system. Rainwater that falls in process areas is collected in the facility's process water system, which drains through an oil/water separator into a retention tank. If necessary, storm water is treated prior to discharge to the City of Rialto treatment system.

No significant changes to surface water runoff are expected due to the proposed project. The project will be constructed within currently developed and generally paved sites. Runoff from the facilities will be handled in the existing surface water treatment systems. Runoff will be collected, treated (if applicable), and discharged under the requirements of the storm water permit or National Pollutant Discharge Elimination System (NPDES) permit or the Industrial Wastewater Discharge Permit. Because the topography of each affected facility will remain essentially unchanged during operation, the proposed project is not expected to increase the surface water runoff at any location. Therefore, no significant impacts are expected to result from water runoff associated with the proposed project.

Flooding

The proposed project sites are not located within flood zones and would not expose people or property to any known water-related hazards.

Changes to Currents or Water Movement

The proposed project sites are located on dry land and not in a water body or channel. The proposed project will occur within the confines of existing industrial facilities. Therefore, the proposed project will not change currents, or course or direction of water movements in a marine or freshwater environment.

Ground Water

Pursuant to the RWQCB Order No. 85-17, a ground water monitoring program was implemented in 1985 to evaluate ground water quality at and in the vicinity of the Wilmington Plant. Under an on-going Port of Los Angeles lease agreement, a ground water monitoring program has been implemented at the Marine Terminal. Ground water monitoring consists of a network of monitoring wells, which includes wells located within the Wilmington Plant and Marine Terminal and down gradient of the properties. Previous ground water contamination has been identified at

the Refinery and Marine Terminal and recent ground water monitoring results indicate that ground water contamination still exists.

At the Marine Terminal, investigations into the source of MTBE contamination has indicated that a dock sump adjacent to Berth's 148 and 149 formerly used for wash waster from clean-up activities was leaking. Tosco has removed the sump and no longer uses the sump. Since removal of the sump, MTBE concentrations within the ground water at the Marine Terminal have decreased. The MTBE extraction system at the Marine Terminal consists of 16 wells and was installed and began operation in October 1998. The average MTBE ground water concentrations at the Marine Terminal in October 1998 was 1,165 parts per million (ppm). The average concentration of MTBE in ground water in March 2000 was 78 ppm. The remaining MTBE is located near the site of the former sump. Therefore, the source of MTBE contamination at the Marine Terminal has been identified and removed. More detailed information regarding the existing ground water contamination is available in the quarterly ground water monitoring reports for the Refinery and Marine Terminal submitted to the Regional Water Quality Control Board and the Port of Los Angeles. Tosco has implemented hydrocarbon removal and recovery activities from ground water at the Refinery and Marine Terminal. The proposed project would use Tank 378, which is currently in MTBE service at the Marine Terminal to store ethanol. Tank 378 is equipped with a double bottom and a leak detection system. Pipelines, including pipelines that transport ethanol, are required to be monitored on an annual basis for corrosion and potential leakage. The proposed project will remove valves and flanges from pipelines which reduces the potential for leaks. Therefore, leaks of ethanol from pipelines also are not expected to occur and impact ground water resources.

The proposed project will reduce the amount of oxygenate transported, used and distributed by Tosco. Less ethanol (almost half as much) will be used as an oxygenate versus MTBE. Therefore, less ethanol will be transported, stored and distributed which also will reduce the potential for leaks.

The proposed project is not expected to negatively impact ground water quality or the existing ground water monitoring/remediation program because of the following: (1) the storage of ethanol will occur in a tank that has a double bottom and a leak detection system which should minimize the potential for leaks and allow for early detection in the event of a leak; (2) pipelines transporting products are leak tested on an annual basis; (3) sources of previous MTBE leaks have been identified and controlled; and (4) the proposed project will use, transport and store less ethanol than MTBE reducing the potential for releases. In fact, the proposed project is expected to generate improvements to currently contaminated ground water by eliminating one known ground water contaminant.

The primary concern related to ground water is the potential to encounter deposits of hydrocarbon contaminated soils from prior oil and gas operation or storage and distribution activities that could adversely affect ground water. Construction activities could uncover contaminated soils, given the heavily industrialized nature of the Tosco facilities and the fact that refining activities, petroleum storage, and distribution have been conducted at the sites for a number of years. Currently, there is no evidence that soil contamination is located within the areas proposed for grading, trenching or

excavation. The major portion of excavation activities is anticipated to occur at the Torrance Tank Farm, and at the Los Angeles and Colton Terminals, where underground pipeline modifications are proposed. The excavation at the Wilmington Plant is anticipated to be limited to less than a cubic yard. No excavation is planned or anticipated at the Marine Terminal for this project.

Contaminated soils or water may require remediation (cleanup and safe removal and disposal) if detected above certain concentrations during construction activities. Even if soils or ground water at a contaminated area do not have the characteristics required to be defined as hazardous wastes, remediation of the area may be required by regulatory agencies. Soil that is found to be contaminated will be analyzed by a State-certified laboratory to determine the concentration and type of contamination. To the extent feasible, all excavated non-contaminated soil will be used for backfill and/or grading at the project site. Contaminated soil may be treated on-site, as required, or taken to an approved off-site treatment/disposal facility.

Excavated soils which contain concentrations of certain substances including heavy metals and hydrocarbons, generally are regulated under California hazardous waste regulations. No significant impacts are expected from the construction-related potential for contaminated soils excavation since there are numerous local, state (Title 22 of the California Code of Regulations) and federal rules which regulate the handling, transportation, and ultimate disposition of these soils. Title 22 of the California Code of Regulations establishes many requirements for hazardous waste handling, transport and disposal, including requirements to use approved disposal/treatment facilities, use certified hazardous waste transporters, and use manifests to track hazardous materials, among many other requirements.

The removal of MTBE from gasoline is expected to provide environmental benefits by reducing the potential impacts to ground water contamination in the event of a gasoline leak (CARB, 1999). The California Air Resources Board has determined that removing MTBE from gasoline will provide an environmental benefit since leaks from storage tanks (primarily underground storage tanks) or pipelines (CARB, 1999) have caused persistent ground water contamination with MTBE. MTBE has objectionable taste and odor which render drinking water unpalatable at low concentrations. MTBE's breakdown product, tertiary butyl alcohol, has similar objectionable noxious properties. Ethanol and its oxidation products such as acetaldehyde are toxic only at very high levels and are also very rapidly biodegraded. Consequently, ethanol is not expected to present major long-term ground water contamination problems (OEHHA, 2000).

Water Demand and Wastewater Generation

Small quantities of water may also be required during the construction phase for dust control. The water use will be minor and will cease following the construction phase. The construction phase is not expected to generate wastewater. The proposed project will not require an increase in water demand at any of the Tosco facilities nor will it generate additional wastewater because no new equipment or modifications of existing equipment require or involve the use of water. Therefore, no significant impacts are expected on water demand or wastewater generation.

3.4.3 Mitigation Measures

No mitigation measures are required for the construction/operation of the proposed project since no significant impacts to water resources are expected.

3.5 AIR QUALITY

3.5.1 Significance Criteria

To determine whether or not air quality impacts from the proposed project are significant, impacts will be evaluated and compared to the significance criteria in Table 3-3. If impacts equal or exceed any of the following criteria, they will be considered significant. All feasible mitigation measures will be identified and implemented to reduce significant impacts to the maximum extent feasible.

The SCAQMD has revised its approach to determining significance for operational emissions from RECLAIM facilities. The Wilmington Plant is the only facility in the proposed project subject to RECLAIM regulations. The proposed project would not result in NOx or SOx emissions from the refinery. Therefore, the revised CEQA significance criteria for RECLAIM facilities do not apply to this proposed project.

3.5.2 Environmental Setting and Impacts

Construction Emissions

Construction activities associated with the proposed project would result in emissions of NOx, CO, SOx, VOCs, and PM10. Construction activities will consist of completing projects at the Wilmington Plant, Marine Terminal, Torrance Tank Farm, Los Angeles Terminal and Colton Terminal. Construction activities are focused on product transfer and storage facilities (i.e., pumps, piping, and storage tanks). Construction emissions are expected from the following equipment and activities:

Construction Equipment (cranes, welding machines, etc.)
Equipment Delivery/On-Site Travel
Heavy Diesel Trucks
Construction Workers Commuting
Fugitive Dust Associated with Site Construction Activities
Fugitive Dust Associated with Travel on Unpaved and Paved Roads

Daily construction emissions were calculated for the peak construction day activities based on activities at all facilities. Peak day emissions are the sum of the highest daily emissions from employee vehicles, fugitive dust sources, construction equipment, and transport activities at all affected facilities for the construction period. Overall construction emissions for the proposed project are summarized in Table 3-4. Detailed construction emissions calculations for the proposed project are provided in Appendix A.

TABLE 3-3

AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NO_x	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
TAC, AHM, and Odor Thresholds		
Toxic Air Contaminants (TACs) Accidental Release of Acutely Hazardous Materials (AHMs)	Maximum Incremental Cancer Risk $\geq$ 10 in 1 million Hazard Index $\geq$ 1.0 (project increment) Hazard Index $\geq$ 3.0 (facility-wide) CAA §112(r) threshold quantities	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants		
NO_2 1-hour average annual average	 20 ug/m^3 (= 1.0 pphm) 1 ug/m^3 (= 0.05 pphm)	
PM10 24-hour annual geometric mean	 2.5 ug/m^3 1.0 ug/m^3	
Sulfate 24-hour average	 1 ug/m^3	
CO 1-hour average 8-hour average	 1.1 mg/m^3 (= 1.0 ppm) 0.50 mg/m^3 (= 0.45 ppm)	

ug/m^3 = microgram per cubic meter; pphm = parts per hundred million; mg/m^3 = milligram per cubic meter; ppm = parts per million; TAC = toxic air contaminant; AHM = Acutely Hazardous Material

Construction Equipment: On-site construction equipment will be a source of combustion emissions. Construction equipment may include air compressors, forklifts, welding machines, and cranes. The consolidated construction schedule for all sites was evaluated to identify the peak construction day. As is typical at construction sites, equipment is operational for limited periods per day and emissions calculations assume this mode of operation. Emission factors for construction equipment were taken from the CEQA Air Quality Handbook (SCAQMD, 1993). Estimated peak emissions from construction equipment are as follows: 44 pounds per day (lbs/day) for CO; 9 lbs/day for VOC; 88 lbs/day for NOx; 9 lbs/day for SOx; and 8 lbs/day for PM10.

Heavy-duty Diesel Trucks: Heavy-duty diesel trucks include trucks that will be watering, or delivering or removing materials from the site. Primary emissions generated include exhaust emissions from diesel engines while operating. Emissions were estimated assuming a truck traveling to each site each weekday. Emissions are based on the estimated number of trips per day and the round trip travel distances. Emission factors, their sources, and other assumptions used to estimate emissions from trucks are provided in Appendix A. Estimated emissions for heavy-duty trucks are as follows: 1 lb/day for CO; less than 1 lb/day for VOC; 1 lb/day for NOx; and less than 1 lb/day for PM10.

Equipment Delivery/On-Site Travel: Light-duty trucks will be used for delivering supplies to the construction site and for transporting various materials on-site to other locations. Primary emissions generated will be combustion emissions from engines. Emissions are based on the estimated number of trips per day and the round trip travel distances. All light-duty trucks, whether used for delivery or on-site travel, were assumed to travel 11.5 miles per day (SCAQMD, 1993, Table A9-5-D). Emission factors, their sources, and other assumptions used to estimate emissions from light-duty trucks are provided in Appendix A. Estimated emissions for light duty trucks are as follows: 4 lbs/day for CO; 2 lbs/day for VOC; 1 lbs/day for NOx, and less than 1 lb/day of PM10.

Construction Workers Commuting: Construction emissions also include emissions from construction worker vehicles traveling to and from each work site. Emissions were estimated assuming a maximum of 85 workers traveling among all sites each weekday. Each vehicle is assumed to travel 11.5 miles (SCAQMD, 1993, Table A9-5-D) to and from work each day, making two one-way trips per day. Emissions from employee vehicles are presented in Table 3-3. Emissions from employee vehicles were calculated using the EMFAC7G emission factors developed by CARB. Estimated exhaust emissions for workers commuting are as follows: 49 lbs/day for CO; 14 lbs/day for VOC; 4 lbs/day for NOx; and less than 1 lb/day for PM10. The emissions estimate is detailed in Appendix A.

TABLE 3-4

PEAK DAY CONSTRUCTION EMISSIONS
(lbs/day)

ACTIVITY	CO	VOC	NOx	SOx	PM10
Construction Equipment					
Wilmington Plant	9.80	2.00	20.8	1.94	1.92
Marine Terminal	2.03	0.45	5.1	0.43	0.42
Torrance Tank Farm	9.70	2.08	21.0	1.98	1.95
Los Angeles Terminal	10.83	2.05	19.5	2.03	2.02
Colton Terminal	11.50	2.20	21.2	2.17	2.16
Total Construction Equipment	43.86	8.78	87.6	8.55	8.47
Heavy-duty Diesel Trucks – All Facilities	1.10	0.25	1.15	--	0.10
Equipment Delivery/ Travel On Site – All Facilities	4.10	2.39	0.74	--	0.01
Workers Commuting					
Wilmington Plant	18.37	5.08	1.37	--	0.06
Marine Terminal	8.61	2.38	0.64	--	0.03
Torrance Tank Farm	4.59	1.27	0.34	--	0.02
Los Angeles Terminal	10.33	2.86	0.77	--	0.04
Colton Terminal	6.89	1.91	0.51	--	0.02
Total, Workers Commuting	48.79	13.50	3.63	--	0.17
Fugitive Dust From Construction	--	--	--	--	0.09
Fugitive Dust/ Travel on Paved & Unpaved Roads	--	--	--	--	13.72
Total Project Construction Emissions	**97.85**	**24.92**	**93.12**	**8.55**	**22.56**
SCAQMD Threshold Level	550	75	100	150	150
Significant?	NO	NO	NO	NO	NO

Fugitive Dust Associated with Site Construction Activities: The fugitive dust source is excavation to modify underground pipeline connections for connection to new aboveground piping at the Torrance Tank Farm, Los Angeles Terminal, and Colton Terminal. During construction activities, water will be applied as a dust suppressant, pursuant to SCAQMD Rule 403, in the construction area during excavation activities to control or reduce fugitive dust emissions. Application of water reduces emissions by a factor of approximately 34 to 68 percent (SCAQMD,

1993). It is assumed herein that water application reduces emissions by 34 percent. Fugitive dust suppression, often using water, is a standard operating practice and is one method of complying with SCAQMD Rule 403. Estimated controlled PM10 emissions from construction activities for fugitive dust sources are less than 1 lb/day. The detailed emission calculations are provided in Appendix A.

Fugitive Dust Associated with Travel on Paved and Unpaved Roads: Vehicles and trucks traveling on paved and unpaved roads are also a source of fugitive emissions during the construction period. The emissions estimates for travel on paved roads assumed that 85 vehicles per day associated with construction workers plus trucks will travel on paved roads. The fugitive emissions for trucks assume travel on both paved and unpaved roads. Emissions of dust caused by travel on paved roads were calculated using EPA AP-42 emission factor for travel on paved roads. Emissions of dust caused by travel on unpaved roads were calculated using the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993). The estimated PM10 emissions from trucks and passenger autos for fugitive dust on paved and unpaved roads is 14 lbs/day. The emissions estimate is detailed in Appendix A.

Miscellaneous Emissions: In addition to the construction-related emissions already identified for the proposed project, the project could generate VOC emissions if contaminated soil is found and soil remediation activities are necessary. The majority of excavation activities for this project are anticipated to occur at the Torrance Tank Farm, and the Los Angeles and Colton Terminals, where underground pipeline modifications are proposed. The excavation at the Wilmington Plant is anticipated to be limited to nine cubic feet. No excavation is planned or anticipated at the Marine Terminal.

Emission estimates for VOC would be speculative at this time, however, because the amount of contaminated soil, if any, and the levels of contamination are currently unknown. VOC-contaminated soil is defined as soil which registers 50 parts per million or greater per the requirements of SCAQMD Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil. If VOC contamination is found, soil remediation must occur under an SCAQMD-approved Rule 1166 Plan to assure the control of fugitive emissions which generally includes covering soil piles with heavy plastic sheeting and watering activities to assure the soil remains moist. Soil remediation activities are under the jurisdiction of the RWQCB and it may be necessary for the RWQCB and SCAQMD to coordinate in order to assure air quality impacts are adequately mitigated.

Construction Emission Summary: Construction emissions are summarized in Table 3-4, together with the SCAQMD daily construction threshold levels. The construction phase of the proposed project will not exceed the significance thresholds for CO, VOC, NOx, SOx, or PM10. Therefore, the air quality impacts associated with construction activities are not significant.

Operational Emissions

Modifications associated with the proposed project will result in an overall decrease in emissions. Emission changes, which are provided in Appendix A, are expected from the following activities:

Fugitive emissions from process equipment
On-road trucks associated with material transport
Truck Loading/unloading emissions
Ship Unloading emissions
Marine vessel emissions

The emission calculations have been revised in the Final Negative Declaration due to modifications to the proposed project that occurred during the detailed SCAQMD engineering review of the permit applications; the development of more detailed information regarding marine vessel deliveries; and to correct calculation errors.

Stationary Source Emissions: Direct operational emission sources are stationary sources located at the Wilmington Plant, Marine Terminal, Torrance Tank Farm, and the distribution Terminals, and are generally subject to regulation. The emissions associated with the proposed project modifications are shown in Table 3-5.

Stationary emission sources include storage tank and fugitive emissions. Fugitive emission sources are associated with process equipment components such as valves, flanges, vents, pumps, and other pipe fittings. Fugitive emission sources also include modifications to storage tank operations, modifications to the Marine Terminal unloading facility, modifications to material transmission piping, and distribution truck loading/unloading racks. The emissions associated with the various fugitive components are based on emission factors developed by the SCAQMD or the U.S. EPA, or engineering estimates.

Emissions at the Wilmington Plant are reduced in all sources because ethanol is less volatile than MTBE and less volume is required to produce oxygenated gasoline. The emissions from Tank 169 will effectively remain the same (less than one pound per day) even though the throughput will increase slightly. The emissions from the Pumping Manifold and Tank 378 at the Marine Terminal will decrease with the change from MTBE to ethanol. At the Los Angeles Terminal, emissions will increase due to a change in commodity from diesel to ethanol, which is more volatile. At the Colton Terminal, emissions will increase due to the installation of additional pumps dedicated to ethanol service.

Additional documentation of the procedures used to calculate the proposed project emissions estimates is provided in Appendix A. All new process components will conform to the SCAQMD Best Available Control Technology (BACT) Guidelines as required by SCAQMD Regulation XIII – New Source Review. BACT associated with each of the major project components is discussed below.

TABLE 3-5

STATIONARY AND INDIRECT SOURCE OPERATIONAL EMISSIONS
(lbs/day)

SOURCE	CO	VOC	NOx	SOx	PM10
Stationary Sources					
Wilmington Plant					
Tank 146	--	-8.17*	--	--	--
Tank 169	--	0.03	--	--	--
Tank 170	--	-9.60	--	--	--
Tank 204	--	-23.60	--	--	--
Tank 206	--	-24.26	--	--	--
Refined Oil Shipping Unit (ROSU)	--	-1.05	--	--	--
Pipeline Metering Manifold	--	-0.23	--	--	--
Marine Terminal					
~~Tank 378~~		~~-22.33~~			
Pumping Manifold	--	-0.10	--	--	--
Torrance Tank Farm					
Pipe Fittings	--	0.39	--	--	--
Los Angeles Terminal					
Tank 3893	--	2.28	--	--	--
Pumping Manifold	--	4.07	--	--	--
Colton Terminal					
Pumping Manifold	--	4.34	--	--	--
Total Proposed Project Stationary Source Emissions:	**--**	**~~-79.79~~ -55.90**	**--**	**--**	**--**
Indirect Sources					
Material Transport by Truck	9.49	1.97	9.55	--	0.70
TOTAL OPERATIONAL EMISSIONS	**9.49**	**~~-77.82~~ -53.93**	**9.55**	**--**	**0.70**
Significance Threshold	550	55	55	150	150
Significant?	NO	NO	NO	NO	NO

*Negative numbers represent emission reductions.

Process Pumps: Sealless pumps will be used, to the extent feasible, for BACT for pumps in gas or light hydrocarbon service. All pumps will be subject to an SCAQMD-approved Inspection and Maintenance Program.

Two new pumps at the Wilmington Plant will have light-liquid (ethanol) as a commodity. At the Marine Terminal, one pump is changing to light-liquid (alkylate) from heavy-liquid (diesel or jet) service, and two pumps are changing light-liquid commodities to ethanol from gasoline blending stocks. The Los Angeles Terminal modifications include up to six new pumps for ethanol transfer to tank storage and the loading and offloading racks. The Colton Terminal proposed modifications include three new pumps and relocating two existing pumps. The proposed pumps will transfer ethanol from the offloading rack to tank storage and from tank storage to the loading rack. The relocated pumps will remain in the same service. No new pumps are anticipated at the Torrance Tank Farm for this proposed project.

Process Valves: Tosco will install leakless valves on project components where applicable to reduce fugitive VOC emissions. The SCAQMD BACT and Lowest Achievable Emission Rate (LAER) guidelines indicate that leakless valves must be used, except for these applications:

- Heavy hydrocarbon liquid service
- Control valves
- Instrument tubing/piping
- Installations where valve failure could pose a safety hazard such as valves for certain services with stems in the horizontal position
- Retrofit/special applications with space limitations
- Applications requiring torsional valve stem motion
- Drain valves with stems in a horizontal position.
- Valves not commercially available (e.g., non-standard size, material, or special connection requirements)

For heavy hydrocarbon liquids and for applications where leakless valves cannot be used, Tosco will use valves of standard API/ANSI design. Fugitive VOC emissions from these valves will be monitored and controlled in accordance with an SCAQMD-approved Inspection and Maintenance Program.

The proposed project will have net reductions of an estimated 27 non-leakless valves at the Wilmington Plant and 76 non-leakless valves at the Marine Terminal. Net increases are anticipated from the proposed project of 16 non-leakless valves at the Los Angeles Terminal and 53 valves at the Colton Terminal. No net change is proposed at the Torrance Tank Farm, where only the valve service is changing from heavy-liquid (diesel) to light-liquid (ethanol) service.

Flanges: The use of flanged connections will be minimized to the extent practicable. Where required for maintenance or other routine operations, flanged connections will be designed in accordance with ANSI B16.5-1988, Pipe Flanges and Flanged Fittings. Fugitive emissions

will be monitored and controlled in accordance with and SCAQMD-approved Inspection and Maintenance Program.

Fittings: The anticipated reductions in the number of fittings at the Wilmington Plant and the Marine Terminal are 83 and 35, respectively. The anticipated increase in the number of fittings at the Los Angeles and Colton Terminals are 393 and 147, respectively. No net change of the fitting count at the Torrance Tank Farm is anticipated.

Indirect Emissions

Indirect emission sources are those that are related to the project but that would not be directly emitted from the project sites, i.e., trucks, marine vessels, and worker vehicles. The potential indirect emissions associated with the project are discussed below.

Truck Trips: The Ethanol Import and Distribution Project is expected to result in the routine transport of ethanol from the Los Angeles Terminal by truck. The number of trucks leaving the Los Angeles Terminal is expected to increase by about eight truck trips per day for the transportation of ethanol to other distribution facilities. Approximately four of these trucks will travel to the Colton Terminal. Tosco may also supply ethanol to facilities owned by Kinder-Morgan in Orange and Mission Valley. A maximum of about four trucks per day may transport ethanol to the Kinder-Morgan facilities. The estimated emissions from truck transport are as follows: 9.5 lbs/day for CO; 2 lbs/day for VOC; 9.6 lbs/day for NOx; and less than 1 lb/day for PM10.

Marine Vessel Emissions: The proposed project is expected to result in a reduction of 14 ~~18~~ marine vessel visits per year. Tosco currently receives MTBE mostly by marine vessel. Upon completion of the proposed project, fewer ethanol shipments will be required than those required for MTBE. Emissions from marine vessels are associated with cruising of vessels into the port, maneuvering of vessels within the port, hotelling (when vessel is running on auxiliary power), and emissions from tug boats. Estimated size and fuel consumption information was obtained from the "Marine Vessel Emissions Inventory and Control Strategies" report (Acurex, 1996). Detailed assumptions for estimating marine vessel emissions are provided in Appendix A. Emissions from marine vessels are presented in Table 3-6. Tug boat emission factors are based on fuel consumption. As detailed information on the fuel consumption for tug boats was not presented in the Acurex report, data from the Mobil Torrance Refinery Reformulated Fuels Project Volume VII – Revised Draft EIR (SCAQMD, 1998) was used to determine hourly emission estimates for tug boats.

Overall the estimated marine vessel emissions on an annual basis and on a maximum daily emissions basis are expected to be less with the proposed project. Maximum daily emissions were calculated for the 24-hour period during a visit that generated the most emissions. Current visits have an average duration of 20.5 hours, while proposed project visits have an average duration of 61.5 hours (including cruising, maneuvering, and hotelling). An additional 1.5 days per visit of emissions are anticipated from this project. However, 14 ~~18~~ fewer visits will occur annually.

Although the VOC emissions increase on a pounds per visit basis, the visit is longer and thus the maximum daily emissions are less. Therefore, the project provides a net emissions benefit.

Worker Travel: The proposed project is not expected to require additional workers above current operating conditions. Therefore, no additional emissions are associated with worker travel to/from the Wilmington Plant, Marine Terminal, Torrance Tank Farm, or the distribution Terminals.

Per the requirements of SCAQMD Rule 1304(c)(4), offsets are not required for projects that are needed to comply with State and Federal regulations. The phase out of MTBE and use of ethanol is required to comply with State and Federal reformulated fuels requirements. Therefore, emission offsets are not required for the proposed project.

Operational Emission Summary: Operational emissions are summarized in Table 3-5, together with the SCAQMD daily operational threshold levels. The operation of the project will not exceed the significance thresholds for the CO, VOC, NOx, SOx or PM10. Therefore, the air quality impacts associated with operational emissions from the proposed project are less than significant. Based on this analysis, no mitigation measures are required for operational emissions.

TABLE 3-6

ESTIMATED EMISSIONS FROM MARINE VESSELS[1]

	CO	VOC	NOx	SOx	PM10
Current Activities					
Cruising, lbs/yr	6,201	1,973	68,662	102,752	16,135
Maneuvering, lbs/yr	1,779	556	20,646	31,616	2,743
Tugboats, lb/yr	3,907	86	697	176	530
Auxiliary Power, lbs/yr	1,231	1,234	12,197	11,744	1,177
Total Annual Emissions, lbs/yr	13,118	3,849	102,202	146,288	20,585
Emissions, lbs/visit (51 ship visits)	239	70	1,858	2,660	374
Maximum Daily Emissions per Visit, lbs/day[2]	239	70	1,858	2,660	374
Proposed Project					
Cruising, lbs/yr	4,192	1,334	46,443	68,881	10,816
Maneuvering, lbs/yr	1,205	377	13,970	21,194	1,847
Tugboats, lb/yr	2,628	58	469	118	357
Auxiliary Power, lbs/yr	3,640	3,642	36,284	34,985	3,521
Total Annual Emissions, lbs/yr	11,665	5,411	97,166	125,178	16,541
Emissions, lbs/visit (37 ship visits)	315	146	2,626	3,383	447
Maximum Daily Emissions per Visit, lbs/day[3]	143	59	1,188	1,553	210
Total Annual Emission Change[4]	-1,453	1,562	-5,036	-21,110	-4,044
Maximum Daily Emission Change[4]	-96	-11	-670	-1,107	-164
Significance Threshold	550	55	55	150	150
Significant?	NO	NO	NO	NO	NO

(1) See Appendix A for detailed emission calculations.

(2) Maximum 24-hour day of emissions includes 8.5 hours of cruising and maneuvering, tug boat assistance during maneuvering, and 12 hours of auxiliary power. All cruising, maneuvering, and tug boat assistance occur within a 24 hour period.

(3) Maximum 24-hour day of emissions includes half of the cruising and maneuvering (4.25 hours), half of the tug boat assistance, and 19.75 hours of auxiliary power. This is the day during the ship visit on which the highest emissions occur.

(4) Negative numbers represent emission reductions.

TABLE 3-6

ESTIMATED EMISSIONS FROM MARINE VESSELS[1]

	CO	VOC	NOx	SOx	PM10
Current Activities					
Cruising, lbs/yr	5,754	1,831	63,724	95,225	14,953
Maneuvering, lbs/yr	1,651	516	19,163	29,300	2,544
Tugboats, lb/yr	530	176	3,907	697	86
Auxiliary Power, lbs/yr	1,142	1,145	11,309	10,888	1,091
Total Annual Emissions, lbs/yr	9,077	3,668	98,103	136,110	18,674
Emissions, lbs/visit (51 ship visits)	178	72	1,924	2,669	366
Maximum Daily Emissions per Visit, lbs/day[2]	178	72	1,924	2,669	366
Proposed Project					
Cruising, lbs/yr	4,192	1,334	46,443	68,881	10,816
Maneuvering, lbs/yr	1,205	377	13,970	21,194	1,847
Tugboats, lb/yr	357	118	2,628	469	58
Auxiliary Power, lbs/yr	2,805	2,821	27,272	26,153	2,589
Total Annual Emissions, lbs/yr	8,559	4,650	90,313	116,697	15,310
Emissions, lbs/visit (37 ship visits)	231	126	2,441	3,154	414
Maximum Daily Emissions per Visit, lbs/day[3]	113	60	1,216	1,555	205
Total Annual Emission Change[4]	-518	982	-7,790	-19,413	-3,364
Maximum Daily Emission Change[4]	-65	-12	-708	-1,114	-161
Significance Threshold	550	55	55	150	150
Significant?	NO	NO	NO	NO	NO

(1) See Appendix A for detailed emission calculations.
(2) Maximum 24-hour day of emissions includes 8.5 hours of cruising and maneuvering, tug boat assistance during maneuvering, and 12 hours of auxiliary power. All cruising, maneuvering, and tug boat assistance occur within a 24-hour period.
(3) Maximum 24-hour day of emissions includes half of the cruising and maneuvering (4.25 hours), half of the tug boat assistance, and 19.75 hours of auxiliary power. This is the day during the ship visit on which the highest emissions occur.
(4) Negative numbers represent emission reductions.

Operational Toxic Air Contaminants

Construction Impacts: The proposed project would generate emissions from construction equipment during construction activities, including emissions from diesel trucks and heavy construction equipment. Diesel particulate emissions were designated a carcinogen by the state Scientific Review Panel in 1998. The Risk Management Subcommittee was formed to identify the: (1) operating parameters; (2) emission factors; and (3) modeling methodologies. This information will be used to develop the scenarios to evaluate the risks associated with exposure to diesel particulate emissions. The SCAQMD is waiting for this guidance before initiating quantitative risk analyses for diesel particulate emissions.

Significant impacts associated with exposure to diesel particulate emissions during construction of the proposed project are not expected because construction at each site is only expected to last about eight weeks. Exposures would only occur for a short time period. A quantitative cancer risk analysis is based on exposure of 70 years (for residential exposures) or 46 years (for occupational exposures) and exposure to project-related emissions would be for a much shorter time period. Further, the maximum particulate emissions from diesel engines during the construction period is about two pounds per day at any one site. Therefore, because of the short exposure period and the small amount of diesel particulate emissions, the emissions of toxic air contaminants during the construction period are expected to be less than significant.

Operational Impacts: A health risk assessment (HRA) was performed to determine if emissions of toxic air contaminants (TACs) generated by the proposed project would exceed the SCAQMD thresholds of significance for cancer and noncancer risks. The health risks were evaluated using the SCAQMD Risk Assessment Procedures for Rules 1401 and 212 guidance Version 5.0 (September 1999).

Emissions of toxic air contaminants were estimated based on information provided by the ethanol supplier. Ethanol is denatured, i.e., rendered non-drinkable, by adding approximately five percent by volume gasoline. Therefore, small amounts of TACs contained in gasoline will be released from the ethanol. Alkylate does not contain detectable amounts of the TACs identified by the California Air Resources Board, under the Air Toxic Hot Spots Program, or in SCAQMD Rule 1401. Tanks 146, 169, and 170 will store alkylate and, therefore, are not included in the toxic air contaminant assessment. The emission rates for each source of toxic air contaminants are shown in Table 3-7.

The assessment of potential health risk requires estimates of the one-hour, six-hour for benzene, and annual average ground level concentrations of toxic air contaminants. The ambient air dispersion analysis was performed using the Industrial Source Complex – Short Term Version 3 model (ISCST3). ISCST3 was used to estimate the ground level concentrations, which provides the basis for the health risk calculations. The health risk calculations used the assumptions developed by the California Air Pollution Control Officers Association (CAPCOA, 1993) for compliance with the requirements of SCAQMD Rule 1401. These assumptions have been widely used for health risk assessments and are accepted by CAPCOA, CARB, and the SCAQMD for completing health risk assessments. The Rule 1401 guidelines provide a series of calculations to

predict health risk due to exposure to toxic air contaminants, including the maximum individual cancer risk to residential and off-site occupational populations, the acute hazard index, and the chronic hazard index (both of these indices measure exposure to hazardous air pollutants with health effects other than cancer). The chemicals evaluated in the HRA as carcinogens and non-carcinogens (acute only) are provided in Table 3-8.

TABLE 3-7

EMISSION RATES FOR STATIONARY SOURCES WITH TOXIC AIR CONTAMINANTS (TACs)

SOURCE	VOC EMISSION RATE (lbs/yr)
Wilmington Plant	
Tank 146	No TAC emissions*
Tank 169	No TAC emissions*
Tank 170	No TAC emissions*
Tank 204	2,839
Tank 206	2,838
Refined Oil Shipping Unit (ROSU)	1,045
Pipeline Metering Manifold	347
Marine Terminal	
Tank 378	2,797
Pumping Manifold	1,761
Torrance Tank Farm	
Pipe Fittings	144
Los Angeles Terminal	
Tank 3893	~~1,200~~ 1,467
Pumping Manifold	1,486
Colton Terminal	
Pumping Manifold	1,584

* Tank will contain alkylate only which contains no TACs.

TABLE 3-8

TOXIC AIR CONTAMINANTS EMITTED AND ASSOCIATED HEALTH EFFECTS

TOXIC AIR CONTAMINANT	CARCINOGEN	NON-CARCINOGEN CHRONIC	NON-CARCINOGEN ACUTE
Benzene	X		X
1,3 Butadiene	X		
Chrysene	X		
Hydrogen Sulfide			X
Indenopyrene	X		
Toluene			X
Xylene			X

Source: SCAQMD, 1999.

Cancer risk estimates reflect a theoretical probability that an individual exposed to emissions continuously over a 70-year period would contract cancer. A cancer risk estimate of 10×10^{-6} or ten per million indicates that, if one million individuals were exposed, there is a statistical probability that ten of those people would contract cancer. This is identified as the significance threshold. Cancer risks below 10×10^{-6} (less than ten in a million) are considered de minimis and not significant by the SCAQMD.

The cancer risk calculations herein assume a continuous 70-year exposure, i.e., a residential exposure. This is a conservative ("worst-case") assumption since it assumes that residents never leave their houses for work, vacations, weekends, to visit friends, or to go shopping, and never move. The cancer risk estimates for the maximum exposed worker assume a 46-year exposure, 240 days per year, and eight hours per day. The HRA evaluated impacts to individuals via a number of exposure pathways including inhalation, dermal absorption, soil ingestion, consumption of homegrown produce, and consumption of mother's milk. The multiple pathways of exposure were accounted for by using the Multi-Pathway (MP) Factor from the SCAQMD Rule 1401 guidance. The Multi-Pathway Factors for carcinogens are listed in Table 3-9.

TABLE 3-9

MULTI-PATHWAY FACTORS

TOXIC AIR CONTAMINANT	MULTI-PATHWAY FACTOR
Benzene	1.00
1,3 Butadiene	1.00
Chrysene	12.70
Indenopyrene	12.70

The maximum individual cancer risk (MICR) and the Acute Hazard Index were calculated from exposure concentrations generated by the ISCST3 model. The carcinogenic and non-carcinogenic impacts were calculated at 100-meter increments from the site property boundary to a maximum of 1,000 meters for all project sites. The impacts were evaluated to determine the maximum impact to off-site receptors and to determine if emissions would exceed the established significance thresholds. The locations associated with the highest calculated MICR at each facility are listed in Table 3-10. The ISCST3 model output files are available electronically from the SCAQMD for review.

TABLE 3-10

MAXIMUM INDIVIDUAL CANCER RISK (MICR)

PROJECT LOCATION	LOCATION OF RECEPTOR	CALCULATED MICR
Wilmington Plant	Residential Receptor (east of facility)	1.80×10^{-11}
	Occupational Receptor at Genstar (east of the facility)	2.31×10^{-12}
Marine Terminal	Occupational Receptor (northeast of facility)	1.20×10^{-11}
Torrance Tank Farm	Residential Receptor (east of facility)	1.66×10^{-11}
	Occupational Receptor (north of the facility)	1.06×10^{-13}
Los Angeles Terminal	Residential Receptor (east of facility)	~~1.44×10^{-11}~~ 1.60×10^{-11}
	Occupational Receptor (southwest of the facility)	~~2.45×10^{-11}~~ 2.56×10^{-11}
Colton Terminal	Occupational Receptor (south of facility)	2.17×10^{-11}

The largest predicted maximum individual cancer risk for the project is 2.56×10^{-11} or 0.0000256 in a million at the Los Angeles Terminal. Based on the health risk calculations, the MICR is expected to be below the 10 per million significance criteria at all project sites. Therefore, no significant impacts associated with exposure to carcinogenic compounds are expected.

The non-carcinogenic health effects of the toxic air contaminants were addressed by calculating acute hazard indices. The SCAQMD Rule 1401 Risk Assessment Guidance does not establish chronic hazard reference exposure levels for the TACs emitted from this project. Therefore, only acute hazard indices were calculated. A hazard index is the sum of the ratios of the predicted concentrations of air toxic contaminants, as generated by the dispersion modeling, to their

respective reference exposure levels for an identified target organ. The acute hazard index compares the maximum one-hour concentration (as predicted by air quality modeling) to the acute acceptable exposure levels. The Acute Reference Exposure Level and the target organs identified for the TAC of interest for this project are listed in Table 3-11.

TABLE 3-11

TOXIC AIR CONTAMINANT
ACUTE REFERENCE EXPOSURE LEVELS (REL)
AND TARGET ORGANS

TOXIC AIR CONTAMINANT	ACUTE REL	TARGET ORGAN(1)					
		CV/BL	CNS/PNS	EYE	IMMUN	REPR	RESP
Benzene	1.30×10^{3}	X			X	X	
Hydrogen Sulfide	4.20×10^{1}						X
Toluene	3.70×10^{4}		X	X		X	X
Xylene	2.20×10^{4}			X			X

(1) CV/BL = Cardiovascular or blood system
CNS/PNS = Central or peripheral nervous system
EYE = Eye
IMMUN = Immune system
REPR = Reproductive system
RESP = Respiratory system

As the indices are additive by target organ, the target organs most indicative of exposure are the reproductive system and the respiratory system. The highest total acute hazard index was estimated to be ~~1.91×10^{-8}~~ 1.97×10^{-8} for the reproductive system (see Table 3-12) at receptors adjacent to the Los Angeles Terminal. Based on the health risk calculations, both the acute hazard indices for residential and occupational receptors are expected to be below the significance threshold of 1.0. Therefore, no significant impacts associated with exposure to non-carcinogenic compounds are expected.

The proposed project will eliminate the use of MTBE and replace it with ethanol in gasoline sold at Tosco retail facilities. This will reduce the amount of MTBE stored in the Basin and used by mobile sources in the Basin. Removal of MTBE from Tosco products will reduce the related emissions of MTBE from the storage, blending and use in vehicles. The emissions of ethanol from these same sources are expected to increase due to the proposed project. The relative toxicities of ethanol, MTBE and the degradation products suggest that the direct effects of ethanol would be substantially less severe than the effects of MTBE (OEHHA, 2000). The proposed project is expected to have beneficial health impacts associated with the reduction in MTBE emissions.

TABLE 3-12

ACUTE HAZARD INDICES

Target Organ	Total Acute Hazard Indices Maximum Residential Impacts	Maximum Occupational/Commercial Impacts
Wilmington Plant		
Reproductive System	1.07×10^{-9}	1.19×10^{-9}
Respiratory Tract	3.30×10^{-10}	3.70×10^{-10}
Marine Terminal		
Reproductive System	No Receptor within 1,000 meters	4.95×10^{-9}
Respiratory Tract	No Receptor within 1,000 meters	9.48×10^{-10}
Torrance Tank Farm		
Reproductive System	9.41×10^{-10}	9.74×10^{-11}
Respiratory Tract	2.15×10^{-10}	2.79×10^{-11}
Los Angeles Terminal		
Reproductive System	~~1.99×10^{-9}~~ 2.17×10^{-9}	~~1.91×10^{-8}~~ 1.97×10^{-8}
Respiratory Tract	~~4.12×10^{-10}~~ 4.56×10^{-10}	~~4.11×10^{-9}~~ 4.23×10^{-9}
Colton Terminal		
Reproductive System	No Receptor within 1,000 meters	7.55×10^{-9}
Respiratory Tract	No Receptor within 1,000 meters	1.23×10^{-9}

The project-related diesel particulate emissions are also expected to be less than significant. The increase in diesel particulate emissions is limited to eight truck trips leaving the Los Angeles Terminal for other terminals. The diesel particulate emissions from these trucks is limited to about one pound per day and these emissions will be dispersed over the entire route that they travel. The emissions at any specified location within Southern California would be less than one pound per day and less than significant. Further, the proposed project will result in a substantial reduction in diesel particulate emissions (about 4,200 pounds per year) due to the elimination of 14 marine vessel trips per year. Therefore, the proposed project will provide an overall environmental benefit by reducing the total amount of diesel particulate emissions on an annual basis in Southern California.

3.5.3 Mitigation Measures

No mitigation measures are required for the proposed project since no significant impacts to air quality are expected. The proposed project will ultimately generate substantial annual emission reductions of CO, VOCs, NOx, SOx, and PM10.

3.6 TRANSPORTATION/CIRCULATION

3.6.1 Significance Criteria

The impacts on transportation/circulation will be considered significant if any of the following criteria apply:

Peak period levels on major arterials within the vicinity of the Tosco facilities are disrupted to a point where level of service (LOS) is reduced to E or F for more than one month.

An intersection's volume to capacity ratio increase by 0.02 (2 percent) or more when the LOS is already E or F.

A major roadway is closed to all through traffic, and no alternate route is available.

There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

The demand for parking facilities is substantially increased.

Substantial alterations to current circulation or movement patterns of people and goods are induced.

Water borne, rail car or air traffic is substantially altered.

Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.

3.6.2 Environmental Setting and Impacts

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.

The proposed project will increase the number of trips related to construction workers and construction equipment during the construction phase. Table 3-13 shows the projected increase in traffic during the construction phase at each facility. Construction workers are expected to arrive at the work sites between 6:30-7:00 a.m. and depart at about 3:30-4:00 p.m., which would generally avoid peak hour traffic conditions. The construction activities are expected to avoid peak hour traffic during morning hours, between 7-9 a.m. and reduce truck trips between 4-6 p.m. due to a

four-day work week. Construction-generated traffic is not expected to have a significant impact on a.m. or p.m. peak hour traffic as the peak a.m. traffic will arrive in advance of the a.m. peak hour and the peak p.m. traffic will be impacted on the reduced schedule. Construction activities also are expected to be limited at each site to a two to three month period. Therefore, the increase in traffic in the area is temporary and will cease following the completion of construction activities. Further, the number of construction workers at each site is minimal (see Table 3-13), in comparison to the traffic in the general area of each site. For example, the highest increase in traffic from the proposed project is in the vicinity of the Wilmington Plant (32 workers plus eight trucks per day). The baseline traffic estimates near the Refinery indicate that the local streets carry between 20,000 and 24,000 vehicles per day (SCAQMD, 1994). The projected increase in traffic during the construction phase of the proposed project is well below a one percent increase in traffic on the local streets and at the local intersections. Similarly, the estimated increase in construction traffic associated with the Phase 2 reformulated fuels project at the Wilmington Plant was a maximum of 670 cars per day. The Level of Service analysis indicated that an increase in 670 vehicles a day was less than significant (SCAQMD, 1994). Therefore, the project impacts on traffic during the construction phase of the proposed project are expected to be less than significant. The construction traffic at the other facilities is predicted to be less than the traffic at the Wilmington Plant and also less than significant. Further, construction workers are expected to avoid peak hour traffic conditions at all sites so that significant traffic impacts would be avoided.

TABLE 3-13

CONSTRUCTION TRAFFIC

Location	Number of Workers	Number of Light Duty Trucks	Number of Heavy Duty Trucks
Wilmington Plant	32	8	1
Marine Terminal	15	4	1
Torrance Tank Farm	8	1	1
Los Angeles Terminal	18	2	1
Colton Terminal	24	3	1

Pursuant to CEQA Guidelines Section 15130(a)(1), no significant adverse cumulative traffic impacts would be expected between the proposed project, existing traffic, and any project because any cumulative impact would not result in part from the proposed project. Further, pursuant to CEQA Guidelines Section 15130(a)(4), the contribution of the proposed project would be considered de minimus and thus not significant because environmental conditions would essentially be the same whether or not the proposed project is implemented.

During the operation of the proposed project, the number of trucks transporting ethanol from the Los Angeles Terminal to other terminals including the Colton Terminal, the Orange Terminal and

the Mission Valley Terminal will increase by approximately eight trucks per day. About two trucks per day each are expected at the Orange and Mission Valley Terminals and about four trucks per day are expected at the Colton Terminal. These trips are expected to be distributed throughout the day so that a maximum of one truck per hour is expected to leave the Los Angeles Terminal. These trucks would arrive at the destination terminals throughout the day. Therefore, a maximum of one truck per hour is expected to arrive at the destination terminals.

Regardless of the existing LOS at any local intersection, the increase in one truck per hour (worst case during peak hour traffic) will not significantly change the existing LOS at any intersection. It would take an increase in traffic of about one percent to potentially have significant impacts on an intersection. The projected increase in truck traffic is well below a one percent increase in traffic at the local intersections near the various sites.

No increase in the number of workers or worker-related vehicles is expected due to operation of the proposed project.

The proposed project is expected to reduce the number of marine vessels transporting materials to the Marine Terminal by about 14 ~~18~~ vessels per year. Therefore, the project will provide a beneficial impact to transportation and circulation of marine vessels within the Port of Los Angeles.

3.6.3 Mitigation Measures

No mitigation measures are required for the proposed project since no significant impacts to transportation/circulation are expected.

3.7 BIOLOGICAL RESOURCES

3.7.1 Significance Criteria

The impacts on biological resources will be considered significant if any of the following criteria apply:

> The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
>
> The project interferes substantially with the movement of any resident or migratory wildlife species.
>
> The project adversely affects aquatic communities through construction or operation of the project.

3.7.2 Environmental Setting and Impacts

The proposed project will be located in heavy industrial areas surrounded by other industrial land uses. The sites of the various Tosco facilities have been fully developed and are essentially void of vegetation with the exception of some landscape vegetation. Tosco controls the growth of vegetation at the sites for fire prevention purposes. All native habitat has long since been removed from the sites. The proposed project does not include the acquisition of additional land for use by Tosco or expansion of any of the Tosco sites outside of their current boundaries which further eliminates the potential for biological resources impacts. The project will not result in the addition or the elimination of water ponds that could be used by animals or migratory fowl. There are no significant plant or animal resources, locally designated species, natural communities, wetland habitats, or animal migration corridors that would be impacted by the proposed project. There are no rare, endangered, or threatened species at the Tosco sites. Based on the above, no significant impacts on biological resources are expected from the proposed project.

3.7.3 Mitigation Measures

No mitigation measures are required for the proposed project since no significant impacts to biological resources are expected.

3.8 ENERGY AND MINERAL RESOURCES

3.8.1 Significance Criteria

The impacts to energy and mineral resources will be considered significant if any of the following criteria are met:

The project conflicts with adopted energy conservation plans.

The project uses non-renewable resources in a wasteful and/or inefficient manner.

The project would result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the state.

The project results in the use of fuel or energy in a wasteful manner.

The project results in substantial depletion of existing energy resource supplies.

Encourages activities that will result in the use of large amounts of fuel or energy resources.

An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.

3.8.2 Environmental Setting and Impacts

The proposed project facilities will require energy in the form of electricity and fuels during construction and will require electricity during daily operations. Electricity and fuels required during construction activities are expected to be minimal, as the construction force required for the proposed project is limited. The electrical requirement can be met with existing electrical supply facilities and infrastructure at all affected Tosco facilities.

The Cogeneration plant at the Wilmington Plant generates a portion of the facility's electricity requirements. The Los Angeles Department of Water and Power supplies the remainder of the electricity requirements. The Wilmington Plant is expected to require about 0.1 megawatts of electricity which can be supplied by either the Cogeneration Plant or the Los Angeles Department of Water and Power. The proposed project may require a small increase in electricity at the terminals due to the addition of pumps. This increase is expected to be very small and result in negligible increase in electricity at the various terminals.

The proposed project is expected to require a total of approximately 15,000 gallons of diesel fuel during construction activities at all affected facilities. Diesel fuel estimates are calculated in Appendix A.

The proposed project is not expected to increase the use of natural gas at the Wilmington Plant, Marine Terminal, Torrance Tank Farm, or distribution Terminals, or refinery fuel gas at the Wilmington Plant. No significant impacts on natural gas supplies are expected.

The proposed project will result in the use of additional quantities of ethanol. Ethanol is a renewable resource and sufficient supplies of ethanol are available from the mid-western portions of the United States and are also available from international sources.

The proposed project is expected to reduce the number of marine vessels that visit the Marine Terminal, thus reducing the consumption of marine fuels. An estimated 124,000 gallons of fuel per year are expected to be conserved as a result of the proposed project due to the reduced number of marine vessel trips. Based on the above, the impacts of the proposed project on energy and mineral resources is expected to be less than significant.

3.8.3 Mitigation Measures

No mitigation measures are required for the proposed project since no significant impacts to energy and mineral resources are expected.

3.9 HAZARDS

3.9.1 Significance Criteria

The impacts associated with hazards will be considered significant if any of the following occur:

The proposed project increases the quantity of hazardous materials stored aboveground onsite or transported by mobile vehicle to or from the site by greater than or equal to the amounts associated with each compound on the Regulated Substances List and Threshold Quantities for Accidental Release Prevention (CalARP, California Code of Regulations, Title 19, Division 2, Chapter 4.5, see Appendix B).
The proposed project creates a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

The proposed project creates a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

The proposed project impairs implementation of or physically interferes with an adopted emergency response or emergency evacuation plan.

3.9.2 Environmental Setting and Impacts

The Wilmington Plant currently uses a number of hazardous materials at the site to manufacture gasoline and other products. The major types of public safety risks at the Wilmington Plant consist of risk from releases of toxic substances and from major fires and explosions. The discussion of the hazards associated with the existing Wilmington Plant is available in the Tosco Risk Management Plan required under the RMP/CalARP regulations. Shipping, handling, storing, and disposing of hazardous materials inherently poses a certain risk of a release to the environment. The toxic substances handled by the Wilmington Plant include hydrogen sulfide, ammonia, and spent sulfuric acid. Additionally, the Wilmington Plant handles regulated flammable substances including propane, butane, isobutane and also handles other petroleum products including MTBE, gasoline, fuel oils, diesel and other products, which pose a risk of fire and explosion.

The proposed project will not change the amount or type of hazardous materials, regulated under the RMP/CalARP regulations, which are transported to or stored at the Tosco facilities. The proposed project will not increase the amount of hydrogen sulfide, ammonia, or spent sulfuric acid at the Wilmington Plant Marine Terminal, or distribution terminals. The proposed project will eliminate the transport of MTBE to the Wilmington Plant. MTBE is not a regulated substance subject to RMP/CalARP regulations. The proposed project will allow ethanol to be transported via marine vessel to the Marine Terminal, via pipeline to the Wilmington Plant, Torrance Tank Farm, and Los Angeles Terminal via trucks to other terminals. Ethanol is also not a regulated substance under the RMP/CalARP regulations. The Marine Terminal is located within the Port of Los Angeles and subjected to review under the risk management portion of the Port's Master Plan (Los Angeles Harbor Department, 1983). This Plan identifies hazards within the Port, provides land use goals, and identifies emergency response procedures for facilities within the Port. The Plan contains policies to guide the future development of the Port in an effort to eliminate the danger of accidents to vulnerable resources. This will be achieved mainly through physical separation, as well as through facility design factors, fire protection, and other risk mitigation measures. The Marine Terminal Operations Manual, in compliance with Coast Guard requirements, details

procedures for preventing and controlling drips and spills during marine activities including ship offloading.

The Refinery, Marine Terminal and truck terminals have spill containment systems in place to reduce the impacts of spills of petroleum products. The Marine Terminal uses a water collection and treatment system to prevent discharges of petroleum products to the Los Angeles Harbor. Drip pans and funnels drain to collection areas to contain leaks. Ship washings and ballast water are stored in two tanks for further treatment and disposal. Spills that would reach the water are controlled by deploying the oil booms available at the Marine Terminal. 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 equipment, and to remove oil from the water and adjacent areas.

All Tosco 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.

The proposed project will reduce the hazards related to the transportation of oxygenate used for blending because 14 ~~18~~ fewer marine vessels per year will deliver oxygenate to the Marine Terminal, thus providing an environmental benefit by reducing the probability of a hazardous incident.

MTBE will no longer be blended into gasoline at the Wilmington Plant and transported via pipeline to the Torrance Tank Farm and Los Angeles Terminal. The transport via pipeline of gasoline containing MTBE will be eliminated.

The proposed project will allow the pipeline transport of ethanol from the Marine Terminal to the Torrance Tank Farm and Los Angeles Terminal. Ethanol will be transported via pipeline from the Marine Terminal through the Wilmington Plant and then to the Torrance Tank Farm for ultimate delivery and storage to the Los Angeles Terminal as well as other distribution terminals. The proposed project is expected to reduce the total volume of material transported by Tosco via pipeline because less ethanol will be blended into gasoline compared to MTBE. The use of ethanol is expected to provide an environmental benefit over the use of MTBE. In the event of a leak or spill, ethanol is expected to break down in the environment more rapidly than MTBE. There are numerous regulations that govern the operation of pipelines and minimize the potential for a leak or spill, including requirements for integrity testing and periodic monitoring of the pipeline. Also, the health impacts related to ethanol exposure are limited (CARB, 1999).

The proposed project will increase the truck transport of ethanol to several truck terminals by about eight trucks per day. Ethanol is not an acutely hazardous material and the hazards related to the transport of eight trucks per day of ethanol are expected to be less than significant.

The overall hazards associated with the handling and transport of ethanol are expected to be less than those associated with MTBE. Ethanol has a lower vapor pressure than MTBE (49-56.5

mmHg for ethanol as compared to 245-256 mmHg for MTBE) (API, 2000). Therefore, a release of ethanol would travel a smaller distance than a release of MTBE, given the same conditions. In addition, the toxicity of ethanol is less than the toxicity of MTBE as shown in Table 3-14 below. Therefore, the health impacts in the event of a release of ethanol also are expected to be less than the health impacts associated with an MTBE release.

TABLE 3-14

HEALTH ASSESSMENT VALUES AND HEALTH PROTECTIVE CONCENTRATIONS

	Non-Cancer		Cancer
	1-Hour (ug/m^3)	**Annual Average (ug/m^3)**	**Unit Risk Factor $(ug/m^3)^{-1}$**
Ethanol	100,000 (53,000 ppb)	100,000 (53,000 ppb)	No evidence of carcinogencity by inhalation.
MTBE	25,000 (7,000 ppb)	3000 (800 ppb)	2.6×10^{-7} (9.3×10^{-7} ppb^{-1})

Source: OEHHA, 2000.

The proposed project is not expected to interfere with an emergency response plan or emergency evacuation plan. The proposed project will result in modifications to the existing Wilmington Plant, Marine Terminal, Torrance Tank Farm, and distribution Terminals. All construction activities will occur within the confines of the existing facilities so that no emergency response plans should be impacted. Tosco has implemented emergency response plans at each of its facilities, but no modifications to the plan are expected as a result of the proposed project.

The proposed project will not increase the existing risk of fire hazards in areas with flammable brush, grass, or trees. No substantial or native vegetation exists within the operational portions of the affected facilities.

3.9.3 Mitigation Measures

No mitigation measures are required for the proposed project since no significant impacts to hazards are expected.

3.10 NOISE

3.10.1 Significance Criteria

Impacts on noise will be considered significant if:

Construction noise levels exceed the City noise ordinance or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary. Construction noise levels will be considered significant if they exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.

The project operational noise levels exceed any of the local noise ordinance at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

3.10.2 Environmental Setting and Impacts

Construction activity for the project will produce noise as a result of operation of construction equipment. Typical sound levels for typical construction equipment are presented in Table 3-15.

The construction equipment associated with the proposed project at each facility will be minimal. The construction equipment at the Wilmington Plant will include (electric and diesel) weld machines, boom truck, and cranes. The construction equipment at the Marine Terminal is expected to be limited to cranes and electric welders. The construction equipment at the Los Angeles Terminal is proposed to be weld machines and cranes. The construction equipment at the Colton Terminal includes an air compressor, weld machines and cranes. The estimated noise level during equipment installation is expected to be an average of about 80 dBA at 50 feet from the center of construction activity. The facility with the closest resident or other sensitive receptor is the Wilmington Plant where the closest resident is about 300 feet. Noise levels diminish after 50 feet. Using an estimated six dBA reduction for every doubling distance, the noise levels at the closest resident is estimated to be 59 dBA. Most of the construction noise sources will be located near ground level, so the noise levels are expected to attenuate further than analyzed herein. Noise attenuation due to existing structures has not been included in the analysis.

TABLE 3-15

CONSTRUCTION NOISE SOURCES

EQUIPMENT	TYPICAL RANGE (decibels)(1)	ANALYSIS VALUE (decibels)(2)
Truck	82-92	82
Air compressor	85-91	85
Flatbed Truck	84-87	85
Pickup	70-85	70
Tractor Trailer	75-92	85
Cranes	85-90	85
Pumps	68-72	70
Welding Machines	72-77	72

1. Data is modified from U.S. Environmental Protection Agency NTID 300.1, 1972, and City of Long Beach, 1975. Levels are in dBA at 50-foot reference distance. These values are based on a range of equipment and operating conditions.
2. Analysis values are intended to reflect noise levels from equipment in good conditions, with appropriate mufflers, air intake silencers, etc. In addition, these values assume averaging of sound level over all directions from the listed piece of equipment.

The construction activities that generate noise will be carried out during daytime from Monday to Friday, or as permitted by the local cities or county. Because of the nature of the construction activities, the types, number, operation time and loudness of construction equipment will vary throughout the construction period. As a result, the sound level associated with construction will change as construction progresses. Construction noise sources will be temporary and will cease following construction activities. Noise levels at the closest residential area are not expected to increase during construction activities, i.e., background noise levels in residential areas generally are in the range of 55-65 dBA. The noise levels from the construction equipment are expected to be within the allowable noise levels established by the local noise ordinance for industrial areas which are about 70 dBA. Noise impacts associated with the proposed project construction activities are expected to be less than significant.

Workers exposed to noise sources in excess of 85 dBA are required to participate in a hearing conservation program. Workers exposed to noise sources in excess of 90 dBA for an 8-hour period will be required to wear hearing protection devices that conform to Occupational Safety and Health Administration/National Institute for Occupational Safety and Health (NIOSH) standards. Since the maximum noise levels during construction activities are expected to be 85 decibels or less, no significant impacts to workers during construction activities is expected.

The new equipment being installed as part of the proposed project generally does not generate noise, with the exception of pumps. The new equipment will be located within existing industrial areas where it is anticipated that the new equipment will not generate noise in excess of that

generated by other adjacent equipment when the adjacent equipment is in operation. Therefore, significant noise impacts from the proposed project are not expected.

The increase in eight trucks leaving the Los Angeles Terminal for other distribution terminals is not expected to have significant impacts on noise levels. A maximum of one additional truck per hour is expected to leave the Terminal and/or arrive at other terminals. The noise level from one truck is not expected to change the background noise level.

3.10.3 Mitigation Measures

No mitigation measures are required for the proposed project since no significant impacts to noise are expected.

3.11 PUBLIC SERVICES

3.11.1 Significance Criteria

Impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

3.11.2 Environmental Setting and Impacts

Construction activities are not expected to result in an increased need for fire services. Construction activities include safeguards, monitoring for hazards with equipment designed to detect sources of flammable gases and vapors, written procedures, training, and authorization for equipment used on-site.

Compliance with State and local fire codes is expected to minimize the need for additional fire protection services. The Wilmington Plant has its own emergency response team, along with the local fire department and other emergency services. The Wilmington Plant maintains an on-site fire department, which is supplemented by the City of Los Angeles, to respond to emergency requirements. The Wilmington Plant maintains a fully-trained 24-hour emergency response team; fire-fighting equipment including fire engines and foam pumper trucks or trailers; and maintains manual and automatic fire suppression systems for flammable and combustible materials. Wilmington Plant staff is trained by the City Fire Department, and on-site fire training exercises with the City Fire Department staff are conducted. The Marine Terminal, Torrance Tank Farm and distribution Terminals have emergency response plans and on-site fire-fighting equipment. The proposed project will not increase the requirements for additional or altered fire protection. Fire-fighting and emergency response personnel and equipment will continue to be maintained and operated at the Tosco facilities. Close coordination with local fire departments and emergency services also will be continued, including the fire departments within the Cities of Los Angeles,

Torrance, and Rialto. (Note that the Los Angeles Fire Department has facilities within and provides fire protection services within the Port of Los Angeles.)

The City of Los Angeles Police Department is the responding agency for law enforcement needs at the Wilmington Plant, Marine Terminal, and Los Angeles Terminal. The City of Torrance Police Department is the responding agency for law enforcement at the Torrance Tank Farm. The City of Rialto Police Department is the responding agency for law enforcement at the Colton Terminal. The existing security forces will monitor construction activities within the Tosco facilities. All facilities are fenced and entry is restricted to authorized individuals. Entry and exit of the construction work force will be monitored and no additional or altered police protection is expected. The operation of the proposed project will not require additional workers and entry to the facilities is restricted. Therefore, no impacts to the local police departments are expected related to the proposed project.

Construction activities at the various Tosco facilities will not involve the relocation of individuals, impact housing or change the distribution of the population. No additional permanent workers are required as part of the proposed project. Thus, the proposed project will not alter existing, or require additional schools.

No increase in the number of Tosco employees is expected due to the operation of the proposed project. The proposed project is expected to increase the truck traffic between the Los Angeles Terminal and other distribution terminals and facilities by eight trucks per day. Therefore, the proposed project would not affect the maintenance of public facilities, nor would it create an increase in demand for additional public facilities such as parks or new roads.

Because, the proposed project consists of minor changes in operations at existing facilities, it will not require other governmental services than are currently provided to the facility. Therefore, the project impacts on public services are expected to be less than significant.

3.11.3 Mitigation Measures

The proposed project impacts on public services are less than significant so no mitigation measures are required.

3.12 SOLID AND HAZARDOUS WASTES

3.12.1 Significance Criteria

The proposed project impacts on utilities and service systems will be considered significant if the following occur:

> The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

3.12.2 Environmental Setting and Impacts

Hazardous Waste

Off-site disposal facilities within California that can be used by Tosco include the Waste Management, Inc. facility in Kettleman City, California and the Laidlaw Environmental Services facility in Buttonwillow.

Waste Management, Inc. Facility: Waste Management, Inc. has a Class I treatment, storage and disposal facility in Kettleman City which has a permitted capacity of 18.5 million cubic yards. At current disposal rates, this facility is expected to continue accepting hazardous wastes through 2017. (ADL, 1997).

Laidlaw Environmental Services Facility: Laidlaw Environmental Services has a Class I facility in Buttonwillow, California with a current permitted capacity of 13 million cubic yards of which approximately 2.5 million cubic yards has been filled (SCAQMD, 1996). Laidlaw Environmental Services treats primarily oil field and refinery wastes and petroleum hydrocarbon contaminated soils. Acid contaminated soils and non-hazardous liquids also are accepted. Services offered include stabilization of metals. In addition, treatment services and landfill disposal are available from the Laidlaw facility located in Westmoreland, California.

Other Facilities: Hazardous waste also can be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; USPCI, Inc., in Murray, Utah; BFI in Lopez, County, Arizona; and Envirosafe Services of Idaho, Inc., in Mountain Home, Idaho. Incineration is provided at the following out-of-state facilities: Aptus, located in Aragonite, Utah and Coffeyville, Kansas; Rollins Environmental Services, Inc., located in Deer Park, Texas and Baton Rouge, Louisiana; Chemical Waste Management, Inc., in Port Arthur, Texas; and Waste Research & Reclamation Co., Eau Claire, Wisconsin.

Non-Hazardous Solid Waste

Los Angeles County landfills currently receive approximately 40,000 tons per day. The status of the Los Angeles County landfills to which municipal solid wastes may be sent is summarized in Table 3-16.

TABLE 3-16

LOS ANGELES COUNTY LANDFILL STATUS

Facility Name	Permitted (tons/day)	1995 Average (tons/day)	Remaining Capacity (tons)	Permit Expiration
Antelope Valley	1,400	553	2,130,000	N/A
Azusa (1)	6,000	1,587	3,000,000	See footnote (1)
BKK	12,000	9,786	2,650,000	1996(2)
Bradley W.	7,000	4,064	7,640,000	4/13/2007
Chiquita Canyon	5,000 (3)	1,389	1,880,000	11/24/97
Lancaster	1,000	596	470,000	4/98
Pebbly Beach	33	8	42,000	Project completion
Puente Hills (4)	13,200	10,157	29,330,000	Project Completion
Scholl Canyon(5)	3,400 (6)	1,447	10,910,000	Project Completion
Spadra (4)	3,700	2,222	2,120,000	Project Completion
Sunshine (7)	6,600	N/O	16,900,000	Project Completion
Whittier (5)	350 (8)	232	2,660,000	N/A

Source: David Smith & Gary Grazak, Los Angeles County Public Works, Waste Management Division, Personal Communication, 1997, and Los Angeles County Countywide Siting Element prepared by the Los Angeles County Public Works, June 1997.

(1) Facility only accepts inert waste.
(2) Closed due to permit expiration in 1996.
(3) Proposed expansion to 10,000 tons per day (six day average) expected.
(4) Origin of waste limited to all jurisdictions except Orange County and the portion of the City of Los Angeles outside the jurisdictional boundary of the County Sanitation Districts.
(5) Restricted Waste shed.
(6) Origin of waste is limited to that generated in the Scholl Canyon Wasteshed as defined by the City of Glendale Ordinance #4780.
(7) Facility began accepting waste on 8/5/96.
(8) Origin of waste limited to that generated in the City of Whittier per City Ordinance.
N/A Not Available.
N/O Not in operation during 1995.

Construction activities could uncover contaminated soils, given the heavily industrialized nature of the Tosco facilities and the fact that refining activities, petroleum storage, and distribution have been conducted at the sites for a number of years. Currently, there is no evidence that soil contamination is located within the areas proposed for grading, trenching, or excavation. Contaminated soils may require remediation if detected above certain concentrations. Remediation could include the removal and disposal of contaminated materials. The proposed project is expected to require minor grading for pipeline modifications so the potential for contaminated materials is expected to be minor. Further, there are existing facilities within the state that can handle the contaminated soil, if necessary. Therefore, significant impacts to hazardous waste disposal facilities are not expected.

Operation of the proposed project is not expected to generate additional hazardous or solid waste as there are no new operations or expansion of existing operations that will generate waste. No significant impacts on hazardous or solid waste facilities are expected.

3.12.3 Mitigation Measures

The proposed project impacts on solid and hazardous waste facilities are less than significant, so no mitigation measures are required.

3.13 AESTHETICS

3.13.1 Significance Criteria

The proposed project impacts on aesthetics will be considered significant if:

The project will block views from a scenic highway or corridor.

The project will adversely affect the visual continuity of the surrounding area.

The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.

3.13.2 Environmental Setting and Impacts

The proposed project will be constructed within the confines of existing industrial facilities including the existing Wilmington Plant, Torrance Tank Farm, Marine Terminal, and distribution Terminals. The facilities are primarily surrounded by industrial land uses, with the exception of the Wilmington Plant, which is in a mixed industrial, residential, and recreational area. The proposed activities at the proposed project facilities are in compliance with the land use and zoning designations. The facilities changes will be indistinguishable by most observers, as they include pipeline modifications, changes in valves, flanges and pumps, and changes to the material stored in existing tanks. No additional lighting is expected to be required at the Tosco facilities, as lighting for safety and security reasons is already in place. There are no scenic views or scenic highways in the vicinity of the proposed sites. Therefore, no significant impacts on aesthetics are expected to occur from the proposed project.

3.13.3 Mitigation Measures

The impacts of the proposed project on aesthetics are less than significant so no mitigation measures are required.

3.14 CULTURAL RESOURCES

3.14.1 Significance Criteria

Impacts to cultural resources will be considered significant if:

> The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
>
> Unique paleontological resources are present that could be disturbed by construction of the proposed project.

3.14.2 Environmental Setting and Impacts

A Cultural Resources Archival Search completed for a previous environmental document (SCAQMD, 1994) indicated no archaeological/historical/paleontological sites are located at the Wilmington Plant. The Marine Terminal, Torrance Tank Farm and distribution Terminals are located in industrial areas that are already developed, graded and largely paved so there is no potential for archaeological/historical/paleontological resources to be adversely affected by the proposed project.

3.14.3 Mitigation Measures

The impacts of the proposed project on cultural resources are less than significant so that no mitigation measures are expected.

3.15 RECREATION

3.15.1 Significance Criteria

The impacts to recreation will be considered significant if:

> The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
>
> The project adversely effects existing recreational opportunities.

3.15.2 Environmental Setting and Impacts

The proposed project will not increase the local population growth or alter the population distribution so there will be no impacts or demand for new neighborhood or regional parks, or other recreational facilities. Due to the industrial nature of the areas near the Wilmington Plant, Marine Terminal, Torrance Tank Farm, Los Angeles Terminal and Colton Terminal, there are few recreational areas of significance at or within the vicinity of the project sites. Harbor Lake and

Harbor Golf Course, located north of the Wilmington Plant, provides recreational opportunities for the Wilmington/San Pedro area. Recreation fields (baseball diamonds) are located west of the Wilmington Plant. The proposed project will be constructed within the confines of the existing facilities. Therefore, no significant impacts to recreation are expected from the proposed project.

3.15.3 Mitigation Measures

The proposed project is not expected to have significant impacts on recreation. Therefore, no mitigation measures are required.

3.16 MANDATORY FINDINGS OF SIGNIFICANCE

The proposed project does not have the potential to adversely affect the environment, reduce or eliminate any plant or animal species or destroy prehistoric records of the past. The proposed project is located at sites that are part of existing industrial facilities, which have been previously disturbed, graded and developed, and this project will not extend into environmentally sensitive areas.

As described above, the only areas where the proposed Ethanol Import and Distribution Project is expected to have potential environmental impacts are construction and transportation. Since construction of this project will be completed prior to the beginning of the RFG Phase 3 project, there would be no overlapping impacts with another project. Additionally, the only operational impacts, which are not significant, are for transportation of ethanol to the Colton facility. There will be no additional transportation to the Colton facility due to the RFG Phase 3 project, therefore, there are no cumulative impacts pursuant to CEQA Guidelines Section 15130(a)(2).

Regarding potential, but insignificant, adverse effects on human beings, please refer to the discussions in Section 3.5 and 3.9.

REFERENCES:

Acurex, 1996. Marine Vessel Emission Inventory and Control Strategies. Prepared for the South Coast Air Quality Management District, December 12, 1996.

ADL, 1997. Draft Project Description and Environmental Assessment for the Air Products Proposed Hydrogen Facility and Existing Specialty Gas Facility. November 18, 1997.

American Petroleum Institute, 2000. Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE. Regulatory and Scientific Affairs, Publication No. 4699. February 2000.

Bolt, Bruce A., 1988. Earthquakes. W.H. Freeman and Company, New York.

California Air Pollution Control Officers Association (CAPCOA), 1993 Air Toxic "Hot Spots" Program, Risk Assessment Guidelines.

California Air Resources Control Board, 1999. Proposed California Phase 3 Reformulated Gasoline Regulations. Staff Report: Initial Statement of Reasons. October 22, 1999.

California Department of Water Resources, 1961. Planned Utilization of the Ground Water of the Coastal Plain of Los Angeles County, Appendix A: Ground Water Geology, Department of Water Resources, Bulletin No. 104.

California Division of Mines and Geology, Map of Seismic Hazard Zones, August 17, 1998

California Environmental Protection Agency Air Resources Board. EMFAC7G. Model Years 1965-1999, July 23, 1998.

Dolan, J. et al., 1995. Prospects for Larger or More Frequent Earthquakes in the Los Angeles Metropolitan Region, Science, Vol. 267, pp. 199-205, dated January 13, 1995.

Ehlig, P.L., 1975. "Geologic Framework of the San Gabriel Mountains", in California Division of Mines and Geology Bulletin 196, titled San Fernando, California, Earthquake of 9 February 1971, dated 1975.

Gere, James M., and Haresh C. Shah, 1984. Terra Non Firma. W.H. Freeman and Company, New York.

Jennings, Charles W., 1985. An Explanatory Test to Accompany the 1:750,000 Scale Fault and Geologic Maps of California. California Division of Mines and Geology, Bulletin 201.

Jones, L.M. and E. Hauksson, 1986. Evaluation of Earthquake Potential in Southern California. In Future Directions Evaluating Earthquake Hazards in Southern California, ed. W.M. Brown, III, W.J. Kockelman, and J.I. Ziony. U.S. Geological Survey Open File Report 86-401.

Kerr, R.A., 1988. New Active Faults in Los Angeles, Science, Vol. 242, p. 1511

Long Beach, City of, 1975. City Noise Element of the City of Long Beach General Plan.

Los Angeles Harbor Department, 1980. Final Environmental Impact Report for Port Master Plan.

Los Angeles Harbor Department, 1983. Risk Management Plan.

Los Angeles Harbor Department, 1994. Environmental Impact Report for the Unocal Marine Terminal.

OEHHA, 2000. Potential Health Risks of Ethanol in Gasoline. Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, February 15, 2000.

Reich, 1992. Scientists Hike Probability of Major Quake, Los Angeles Times, December 1.

SCAQMD, 1993. CEQA Air Quality Handbook, SCAQMD, May 1993.

SCAQMD, 1994. Environmental Impact Report, Unocal Los Angeles Refinery Reformulated Gasoline Project, SCH 93011013, South Coast Air Quality Management District , 1994.

SCAQMD, 1996. 1997 Air Quality Management Plan, Draft Environmental Impact Report, August, 1996.

SCAQMD, 1998. Mobil Torrance Refinery Reformulated Fuels Project Volume VII – Revised Final EIR, SCH9301100, South Coast Air Quality Management District, 1998.

SCAQMD, 2000. The Magnitude of Ambient Air Toxics Impacts from Existing Sources (MATES) in the South Coast Air Basin.

Source Fault Hazard Zones in California, 1988.

Tinsley, J.C ., T.L Youd, D.M. Perkins, and A.T.F. Chen, 1985. Evaluating Liquefaction Potential. In Evaluating Earthquake Hazards in the Los Angeles Region – An Earth-Science Perspective, ed. J.I. Ziony. U.S. Geological Survey Professional Paper No. 1360.

Toppozada, T.R., Bennett, J.H., Borchardt, G., Saul, R., and Davis, J.F., 1988. Planning Scenario for a Major Earthquake on the Newport-Inglewood Fault Zone, California Division of Mines and Geology Special Publication 99, 197 pp.

Toppozada, T.R., Bennett, J.H., Borchardt, G., Saul, R., and Davis, J.F., Johnson, C.B., Lagorio, H.J. and Steinbrugge, K.V., 1989. Earthquake Planning Scenario for a Major Earthquake on the Newport-Inglewood Fault Zone, California Geology Vol. 42, no 4, p.75-84

USGS, 1992. Southern California Earthquakes. Susan R. Goter, U.S. Geological Survey National Earthquake Information Center Ziony. U.S. Geological Survey Open File Report 92-533.

Yanev, Peter, 1974. Peace of Mind in Earthquake Country: How to Save Your Home and Life. Chronicle Books, San Francisco.

Yerkes R.F., 1972. Geology and Oil Resources of the Western Puente Hills Area, Southern California, U.S. Geological Professional Paper 420-C, 1972.

MRB:WORD:1942IS3