CHAPTER 4

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Introduction
Air Quality
Hazards and Hazardous Materials
Noise
Transportation/Traffic
Other CEQA Topics

4.0 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

This chapter assesses the potential environmental impacts of the construction and operation of the BP Carson Refinery Safety, Compliance, and Optimization Project discussed in Chapter 2.

Chapter 4 evaluates those impacts that are considered potentially significant under the requirements of CEQA, as determined by the NOP/IS (see Appendix A). Specifically, an impact is considered significant under CEQA if it leads to a "substantial, or potentially substantial, adverse change in the environment."

Impacts from the proposed project fall within one of the following categories:

Beneficial – Impacts will have a positive effect on the resource.

No impact – There would be no impact to the identified resource as a result of the proposed project.

Adverse but not significant – Some impacts may result from the project; however, they are judged to be insignificant. Impacts are frequently considered insignificant when the changes are minor relative to the size of the available resource base or would not change an existing resource.

Potentially significant but mitigation measures reduce to insignificance – Significant adverse impacts may occur; however, with proper mitigation, the impacts can be reduced to insignificance.

Potentially significant and mitigation measures are not available to reduce to insignificance – Adverse impacts may occur that would be significant even after mitigation measures have been applied to lessen their severity.

4.2 AIR QUALITY

4.2.1 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 4-1. 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.

TABLE 4-1
Air Quality Significance Thresholds

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NOx	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
Toxic Air Contaminants (TACs) and Odor Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk $\geq$ 10 in 1 million Cancer Burden > 0.5 Hazard Index $\geq$ 1.0 (project increment) Hazard Index $\geq$ 3.0 (facility-wide)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants[(a)]		
NO_2 1-hour average annual average	In attainment; significant if project causes or contributes to an exceedance of any standard: 0.25 ppm (state) 0.053 ppm (federal)	
PM10 24-hour annual geometric mean annual arithmetic mean	10.4 ug/m^3 (recommended for construction)[(b)] 2.5 ug/m^3 (operation) 1.0 ug/m^3 20 ug/m^3	
Sulfate 24-hour average	1 ug/m^3	
CO 1-hour average 8-hour average	In attainment; significant if project causes or contributes to an exceedance of any standard: 20 ppm (state) 9.0 ppm(state/federal))	

(a) Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.

(b) Ambient air quality threshold based on SCAQMD Rule 403.

ppm = parts per million; $\mu g/m^3$ = microgram per cubic meter; mg/m^3 = milligram per cubic meter; lbs/day = pounds per day; $\geq$ greater than or equal to

The SCAQMD makes significance determinations based on the maximum daily emissions during the construction period, which provides a "worst-case" analysis of the construction emissions. Similarly, significance determinations for operational emissions are based on the maximum daily emissions during the operational phase.

Subsequent to the adoption of the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993), the SCAQMD adopted Regulation XX - Regional Clean Air Incentive Market (RECLAIM), which fundamentally changed the framework of air quality rules and permits. The RECLAIM program is a pollution credit trading program which applies to the largest sources of NOx and SOx emissions within the jurisdiction of the SCAQMD. RECLAIM facilities are given an emissions allocation that reflects their historical usage, but that declines yearly to reduce total emissions. RECLAIM facilities are also allowed to buy and sell credits. The emissions from the universe of RECLAIM facilities were capped in 1994. The emissions cap declined each year from 1995 to 2003, and is now fixed at a level of approximately 78 percent below the initial levels. After implementation of the RECLAIM program, the SCAQMD staff examined how to apply the CEQA significance thresholds to RECLAIM facilities, recognizing that CEQA case law directs that the existing environmental setting include permits and approvals that entitle operators to conduct or continue certain activities. SCAQMD staff determined that the baseline should consist of the RECLAIM initial allocation for each RECLAIM facility *for RECLAIM pollutants*, and that a proposed project would be considered significant if it would cause the facility's emissions to exceed the baseline plus the adopted significance threshold.

Under the RECLAIM program, the SCAQMD issued facility-wide permits to sources. The facility permits specify an initial allocation and annual emission allocations for NOx and SOx. The initial allocations were based on historical reported emissions for the years immediately prior to implementation of the RECLAIM program. Annual allocations represent the number of RECLAIM Trading Credits (RTCs) the facilities begin with each year and the allocations showed a decline each year from 1994 through 2003. Operators of RECLAIM sources must not emit more than the total number of RECLAIM credits they possess, which include the annual allocation plus any credits bought and minus any credits sold. In this way, the RECLAIM process reduces, on an annual basis, the overall emissions of NOx and SOx in the Basin, while providing flexibility to individual facilities that purchase RTCs so that they can operate to their actual emission levels established in 1994. RECLAIM facilities can also reduce emissions through a variety of ways including curtailing production and installing pollution control equipment to reduce emissions below their annual allocations. These facilities can generate credits to sell. Although the allocations for RECLAIM facilities have declined each year since 1994, the maximum annual emiscsions of NOx and SOx permitted to each facility remain at the 1994 limits, provided that additional allocations ("trading credits") are acquired from another RECLAIM facility that has reduced its emissions below its current-year allocation.

Air quality impacts for a RECLAIM facility are considered to be significant if the incremental mass daily emissions for NOx and SOx from sources regulated under the RECLAIM permit, when added to the allocation for the year in which the project will commence operations, will be greater than the facility's 1994 allocation (including non-tradable credits) plus the increase established in the SCAQMD Air Quality Handbook for that pollutant (55 pounds per day [lb/day] for NO_x and 150 lb/day for SO_x). In order to make this calculation, annual allocations as well as the project's incremental annual emissions are converted to a daily average by dividing by 365. Thus, the proposed project is considered significant if:

$(A_1/365) + I < (P + A_2)/365$

Where:

P = the annual emissions increase associated with the proposed project.

A_1 = 1994 initial annual allocation (including non-tradable credits).

A_2 = Annual allocation in the year the proposed project will commence operations.

I = Incremental emissions established as significant in the SCAQMD Air Quality Handbook (55 lb/day NO_x or 150 lb/day SO_x).

The determination of CEQA significance for RECLAIM facilities applies only to operational emissions of NOx and/or SOx that would be included in the RECLAIM allocation and subject to the RECLAIM regulations. The RECLAIM CEQA significance determination does not apply to sources that would not be regulated by the RECLAIM regulations (i.e., off-site sources of emissions such as trucks, rail cars, and marine vessels), construction emission sources, and to non-RECLAIM pollutants (i.e., VOC, CO, and PM10) for which the SCAQMD has established significance thresholds. The level of emissions at which CEQA significance is triggered for RECLAIM pollutants NOx and SOx for the BP Carson Refinery ($(A_1/365) + I$) is calculated in Table 4-2.

TABLE 4-2
Determining Significance for RECLAIM Pollutants at the BP Carson Refinery

Pollutant	A_1 Initial Allocation (lb/yr)[a]	$A_1/365$ Initial Allocation (lb/day)	I Significance Threshold (lb/day)	$A_1/365 + I$ (lb/day)	2006/2007 Allocation	Maximum Allowable Emission Increase
NO_x	3,706,790	10,156	55	10,211	4,063	6,148
SO_x	3,702,692	10,144	150	10,294	2,341	7,953

[a] Includes non-tradeable credits

The use of the RECLAIM CEQA NOx and SOx significance criteria to determine the significance of air quality impacts from stationary sources subject to RECLAIM at the BP Carson Refinery is appropriate because the refinery is a RECLAIM facility. The proposed project will not result in an increase in NOx and SOx emissions from sources regulated under RECLAIM so the significance criteria identified in Table 4-2 are not applicable to the proposed project.

4.2.2 ENVIRONMENTAL IMPACTS

4.2.2.1 Construction Emission Impacts

4.3.2.1.1 Regional Impacts

Construction emissions are expected from the following equipment and processes:

Construction Equipment (dump trucks, backhoes, graders, etc.)
Vehicle Emissions, including Delivery Trucks
Fugitive Dust Associated with Site Construction Activities
Fugitive Dust Associated with Travel on Unpaved and Paved Roads
Architectural Coatings

Construction emissions were calculated for different phases of construction activities. As shown in Figure 2-5, construction activities vary for the various portions of the proposed project, but construction activities overlap for a number of portions of the project. BP expects that the start date for construction activities related to the FCCU upgrades will begin in January 2008. However, the FCCU will be at the end of its five-year run cycle. If problems in FCCU operations arise, engineering problems may arise to affect the construction schedule. Therefore, emission calculations were completed in Appendix B that assumed the FCCU turnaround would begin in October 2007. Emission calculations were completed in Appendix C, assuming that the FCCU turnaround would begin in January 2008. Daily construction emissions were calculated for the peak construction day activities. Peak day emissions are the sum of the highest daily emissions from employee vehicles, fugitive dust sources, construction equipment, and transport activities for the construction period. Peak construction emissions for all pollutants are expected to occur in November 2007, assuming that the FCCU turnaround begins in October 2007 (see Appendix B). Should BP decide to start the FCCU turnaround at a later date, the construction emissions are expected to be lower (see Appendix C).

The peak emissions were calculated for each pollutant and are included in Table 4-3. The peak emissions for all pollutants are estimated to occur during November 2007 (see Appendix B). Detailed construction emissions calculations are provided in Appendix B.

Construction Equipment

On-site construction equipment will be a source of combustion emissions. Construction equipment may include backhoes, compressors, concrete saws, cranes, excavators, forklifts, front end loaders, generators, roll-off trucks, tractors, water truck and welding machines. Most of the equipment is assumed to be operational for eight hours per day. Construction workers are expected to be at the site for longer than eight hours per day, but including time for lunch and breaks, organization meetings, and so forth, construction equipment would not be expected to operate the entire time. Also, during peak construction periods, two work shifts are expected. The emission calculations assume more equipment operating eight hours per day, not more operating hours per piece of

equipment. For example, instead of assuming that one crane will operate for 16 hours per day, the emission calculations assume two cranes will operate for eight hours per day. Emission factors for construction equipment were taken from the CEQA Air Quality Handbook (SCAQMD, 1993, Tables 9-8-A, 9-8-B, 9-8-C and 9-8-D) using site-specific information, where available. Estimated emissions from construction equipment used for construction activities are included in Table 4-3.

TABLE 4-3

BP Carson Refinery
Peak Construction Emissions[(1)]
(lbs/day)

ACTIVITY	CO	VOC	NOx	SOx	PM10
Construction Equipment	671.99	163.33	1525.63	116.26	86.58
Vehicle Emissions	363.83	41.40	107.31	0.32	3.25
Fugitive Dust From Construction[(2)]	--	--	--	--	48.05
Fugitive Road Dust[(2)]	--	--	--	--	69.81
Architectural Coatings	--	45.63	--	--	--
Total Construction Emissions[(3)]	**1,035.82**	**250.37**	**1,632.94**	**116.57**	**207.69**
SCAQMD Threshold Level	550	75	100	150	150
Significant?	YES	YES	YES	NO	YES

(1) Peak emissions for all pollutants predicted to occur during November 2007.
(2) Assumes application of water three times per day.
(3) The emissions in the table may differ slightly from those in Appendix B due to rounding.

Vehicle Emissions

Vehicle emissions include construction workers, pick up trucks, boom trucks, stakebed trucks, flatbed trucks and delivery trucks. Primary emissions generated will include combustion emissions from engines during idling and while operating. Emissions are based on the estimated number of trips per day and the round trip travel distances.

Construction emissions include emissions from construction worker vehicles traveling to and from the work site. Emission calculations were estimated assuming a maximum of 740 workers traveling to the site each weekday during November 2007, which is the month when construction emissions are expected to be the highest (see Appendix B). (Note that more workers (850) are expected in January 2007; however, the overall construction emissions during January 2007 are expected to be lower than in November 2007 because more construction equipment will be used in November 2007). Each worker commute vehicle is assumed to travel 16.2 miles (SCAG, 2000) to and from work each day, making two one-way trips per day. Emissions from employee vehicles are presented in Table 4-3. Emissions from employee vehicles were calculated using the

EMFAC2002 emission factors developed by CARB. Estimated exhaust emissions for workers commuting are included in Table 4-3.

All pick up trucks are assumed to travel 10 miles per trip. Buses will be used for delivering workers from parking areas to the construction site. All buses were assumed to travel four miles per trip.

Heavy diesel trucks include boom trucks, stakebed trucks, flatbed trucks and delivery trucks. Primary emissions generated will include exhaust emissions from diesel engines while operating. Emission calculations were estimated assuming a maximum of 89 delivery trucks traveling to the site each day during months with peak construction emissions to deliver large equipment and average 30 miles per trip. Emissions from trucks (both light-duty and heavy-duty) were calculated using the EMFAC2002 emission factors developed by CARB. Estimated emissions for heavy trucks are included in Table 4-3

Fugitive Dust Associated with Site Construction Activities

Fugitive dust sources include grading, trenching, wind erosion and truck filling/dumping at the site to construct necessary foundations. During construction activities, water used as a dust suppressant will be applied in the construction area during grading, trenching, and earth-moving 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 one water application per day reduces emissions by 34 percent, two applications reduce emissions by 50 percent, and three applications reduce emissions by 68 percent. Fugitive dust suppression, often using water, is a standard operating practice and is one method of complying with SCAQMD Rule 403. Estimated peak controlled PM10 emissions during peak construction activities for fugitive dust sources are 48.05 pounds per day (see Table 4-3). The detailed emission calculations are provided in Appendix B.

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. Fugitive dust emissions were also calculated for on-site cars, light-duty trucks and buses. The fugitive emissions for trucks assume delivery trucks will travel on paved roads and water trucks will travel on unpaved roads. Emissions of dust caused by travel on paved roads were calculated using the U.S. EPA's, AP-42, Section 13.2.1 emission factor for travel on paved roads and using the CARB's Methodology 7.9 to determining the appropriate silt loading. No travel on unpaved roads is expected because the roads within the Refinery are paved. The estimated PM10 emissions during peak construction activities from trucks and passenger autos for fugitive dust on paved roads is 69.81 pounds per day (see Table 4-3).

Architectural Coatings

There is the potential for emissions from the use of architectural coatings on new structures, e.g., new vessels. Thirteen gallons of paint per day are expected to be used during peak construction activities (November 2007). *In order to provide a worst-case estimate of project emissions, it is assumed that the Refinery would use the coating with the highest* ~~Assuming that the~~ VOC content ~~of the coating~~ *that* complies with SCAQMD Rule 1113 (3.5 pounds per gallon *or 420 grams per liter* for high temperature industrial maintenance coatings). *Therefore, a maximum of* about 45.6 pounds per day of VOC emissions would be expected from the use of architectural coatings during peak construction activities.

Miscellaneous Emissions

In addition to the construction-related emissions already identified for the proposed project, the project could generate emissions of VOC if contaminated soil is found and soil remediation activities are necessary. 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 Regional Water Quality Control Board (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 activities associated with the modifications to the Refinery would result in emissions of CO, VOC, NOx, SOx, and PM10. Construction emissions for the proposed project are summarized in Table 4-3, together with the SCAQMD's daily construction threshold levels. The construction phase of the Refinery's proposed project will exceed the significance thresholds for CO, VOC, NOx, and PM10. Therefore, the air quality impacts associated with construction activities are considered significant.

4.3.2.1.2 Localized Construction Impacts

The SCAQMD has developed Localized Significant Threshold (LST) Methodology to evaluate the potential localized impacts of criteria pollutants from construction activities (SCAQMD, 2003c). The LST Methodology requires that the emissions of criteria pollutants be evaluated for impacts on ambient air quality standards, including carbon monoxide (CO), nitrogen dioxide (NO_2), and particulate matter less than 10 microns in diameter (PM10) associated with the project.

In order to determine the groundlevel concentrations, the U.S. EPA ISCST3 (Version 02035) air dispersion model was used to model the peak day construction emissions (see Table 4-3) and calculate the annual average and maximum 1-hour, 8-hour, and 24-hour concentrations. The details of the assumption used in the modeling in provided in Appendix B.

The project construction maximum groundlevel concentrations are compared to the significance thresholds established in SCAQMD Rule 1303, Appendix A, Table A-2 for CO and NO_2 to demonstrate that construction emissions will not cause a violation of any state or national ambient air quality standard. PM10 is compared to 10.4 micrograms per cubic meter ($\mu g/m^3$), which is comparable to the requirement in Rule 403. PM10 is evaluated differently that CO and NO_2 because PM10 in nearly the entire district exceeds the state or federal PM10 standards. The CO 1-hour, CO 8-hour, NO_2 1-hour, and NO_2 annual average groundlevel concentrations from the proposed project are combined with the maximum ambient concentrations and compared to the Most Stringent Air Quality Standard. The results are presented in Appendix B (see Table B-27).

The localized significance threshold analysis indicates that no significant change in local ambient air quality for NO_2, CO, or PM10 is expected from construction activities associated with the proposed project. Therefore, the proposed project complies with the localized significance threshold methodology and no localized significant impacts on air quality during the construction period are expected.

4.2.2.2 Operational Emission Impacts

The proposed project operational emissions are evaluated in this section. Detailed emission calculations are provided in Appendix B. The total operational emissions from the proposed project are identified in Table 4-4. The primary source of emissions are modifications to existing Refinery units, including the FFHDS Unit, FCCU, Alky Merox Unit, Alkylation Unit, Hydrocracker Unit, Coker Gas Debutanizer Unit, Vapor Recovery System, and Flares. The proposed modifications at the Refinery are expected to generate emissions primarily from the installation of fugitive components (e.g., pumps, valves, and flanges). Emission increases are also expected due to increases in mobile sources. No emission increases are expected from modifications to the Sulfur Plant.

Operational emissions are characterized as either stationary source emissions or off-site source emissions. Stationary emission sources include fugitive emissions sources from process equipment components such as valves, flanges, vents, pumps, drains, and compressors. Fugitive emissions will also be associated with modifications at the Refinery. The emission calculations herein are based on emission factors that are outlined in a Memorandum from the SCAQMD dated April 2, 1999 (SCAQMD, 1999). That Memorandum provides the appropriate emission factors for fugitive sources that include best available control technology (BACT) and lowest achievable emission reductions (LAER). Modifications to existing and new equipment are required to comply with BACT requirements in SCAQMD Rules 1303 or 2005 for RECLAIM equipment.

TABLE 4-4[(1)]
BP Carson Refinery Stationary Source Operational Emissions
(lbs/day)

Sources	CO	VOC	NOx	SOx	PM10
STATIONARY SOURCES:					
FFHDS Modifications	--	~~15.55~~ *16.02*	--	--	--
FCCU Upgrades	--	0.91	--	--	--
Alkyl Merox Modifications	--	~~1.26~~ *<5*	--	--	--
Alkylation Unit Modifications	--	~~0.03~~ *<5*	--	--	--
Hydrocracker Unit Modifications	--	~~0.52~~ *0.71*	--	--	--
Coker Gas Debutanizer Modifications	--	0.26	--	--	--
Enhanced Vapor Recovery System	--	~~6.85~~ *17.00*	--	--	--
North Area Flare Gas Recovery	--	~~11.25~~ *6.84*	--	--	--
Modify Pressure Relief Devices (52 Vacuum Unit)	--	*-1.77*			
Total Stationary Source Emission Increases:	**0.0**	**~~34.1~~** ***49.97***	**0.0**	**0.0**	**0.0**
OFF-SITE EMISSION SOURCES:					
New Workers Commuting	1.53	0.17	0.16	0.0	0.01
Delivery Trucks	11.22	~~1.72~~ *1.18*	16.33	0.02	0.29
Fugitive Road Dust	--	--	--	--	14.22
Locomotive Engines	0.54	0.20	3.93	0.33	0.13
Total Off-Site Emission Increases:	**13.29**	**~~2.09~~** ***1.55***	**20.42**	**0.36**	**14.66**
Total Operational Emission Increases:	**13.29**	**~~36.2~~** ***51.52***	**20.42**	**0.36**	**14.66**
SCAQMD Thresholds	550	55	55	150	150
Significant?	**NO**	**NO**	**NO**	**NO**	**NO**

(1) Table 4-4 primarily addresses estimated project emission increases. *Project modifications to the Sulfur Plant are not expected to result in emission increases and are not included in the table*. The proposed project is expected to result in PM10 emission reductions associated with modifications to the FCCU for Rule 1105.1 compliance, VOC emissions reductions from the Enhanced Vapor Recovery System, and SOx and other combustion-related emissions reductions from the North Flare Gas Recovery System. Sufficient data to quantify some of the emission benefits are not currently available. The emission benefits associated with the proposed project are addressed in subsection 4.2.2.3 Operational Emission Benefits.

Additional documentation of the procedures used to calculate the emissions estimates is provided in Appendix B. All new and modified process components are required to conform to the SCAQMD's BACT Guidelines. The criteria pollutant emission rates

associated with all project components assumed the use of BACT. The BACT associated with each of the major project components is discussed below. Fugitive emission sources are also regulated under New Source Performance Standards (NSPS) Subpart GGG and SCAQMD Rule 1173.

Process Pumps: Sealless pumps will be used, to the extent feasible and commercially available, as BACT for pumps in light hydrocarbon service. For those instances where sealless pumps are deemed unacceptable, two types of double or tandem mechanical seals will be evaluated for use: (1) tandem mechanical seals that use a barrier fluid and a seal pot vented to a closed system; and (2) dry-running tandem mechanical seals vented to a closed system. The dry-running tandem mechanical seals are considered to be equivalent control technology since they control fugitive VOC emissions as well as the tandem mechanical seals with the barrier system. All pumps will be subject to an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1173.

Process Valves: Bellow sealed valves will be installed on project components to reduce fugitive VOC emissions. The SCAQMD BACT/LAER guidelines indicate that leakless valves must be used, except for the following applications.

- Heavy hydrocarbon liquid service
- Control valves
- Instrument tubing/piping
- Installations where valve failure could pose a safety hazard (e.g. drain valves with stems in a horizontal position)
- Retrofit/special applications with space limitations
- Applications requiring torsional valve stem motion
- Valves not commercially available
- Components exclusively handling commercial natural gas
- Components exclusively handling fluids with a VOC concentration of ten percent by weight or less
- Components incorporated in lines while operating under negative pressure
- Lubricating fluids
- Components buried below ground
- Components handling liquids exclusively, if the weight percent evaporated is ten percent or less at 150 degrees Centigrade, as determined by ASTM Method D-86
- Pressure vacuum valves on storage tanks

For heavy hydrocarbon liquids and for applications where leakless valves cannot be used, valves of standard API/ANSI design will be used. Fugitive VOC emissions from light liquid valves will be monitored and controlled in accordance with an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1173. Valves in gas/vapor and in light liquid service initially will be monitored on a monthly basis, in compliance with the Federal Standards of

Performance for Equipment Leaks of VOC in Petroleum Refineries (40 CFR Part 60, Subpart GGG). Valves that do not leak during two successive monthly inspections will revert to a quarterly inspection interval. New valves will be subject to a 500 ppm limit.

Process Drains: New process drain lines will be provided with two normally closed block valves in series, or a single block valve in series with a cap or plug. New drain hubs (funnels) will be equipped with P-Traps and/or seal pots along with an SCAQMD-approved inspection and maintenance program, as required under SCAQMD Rule 1173.

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 an approved inspection and maintenance program, as required under SCAQMD Rule 1173.

Pressure Relief Devices (PRDs): PRDs will be routed to the existing Refinery flare system, where required, to control VOC emissions.

In addition, emission offsets are required for new and modified permitted emission sources by SCAQMD Regulation XIII and/or Regulation XX. Emission offsets are required for all emission increases associated with stationary sources, thus, minimizing the impacts associated with emissions from stationary sources. Therefore, emission offsets will be required for the VOC emissions from stationary sources.

Off-site emission sources are those that are related to the proposed project, but that would not be directly emitted from the project site, i.e., trucks. The operation of the proposed project is expected to require four new workers, a maximum of eight additional delivery trucks per day, and a maximum of one additional railcar at the facility on a daily basis. The emission increases associated with the increased off-site emission sources are shown in Table 4-4.

Total operation emissions from the proposed project are summarized in Table 4-4, together with the SCAQMD's daily operational threshold levels. The operation of the proposed project is not expected to exceed the SCAQMD significance thresholds for any pollutant. Therefore, the air quality impacts associated with operational emissions from the proposed project are less than significant.

4.2.2.3 Operational Emission Benefits

Table 4-4 describes the potential emission increases associated with the proposed project. It should be noted that the proposed project is expected to provide emission benefits associated with the following:

- The proposed project will increase the capability of the BP Refinery to produce low sulfur gasoline by about 20,000 gallons per day without an increase in crude throughput. This will be accomplished by producing additional gasoline blending components at the Hydrocracker, FCC, and Alkylation Units. The use of low sulfur gasoline results in lower emissions of SOx and particulate matter from vehicles that use the fuels.

- The proposed project will increase the production of ultra low sulfur diesel and jet fuel (less than 15 ppm sulfur) by about 29,000 gallons per day and 121,800 gallons per day respectively, without increasing the crude throughput. This will be accomplished by producing additional blending components from the Hydrocracker Unit.

- The proposed project is expected to reduce particulate emissions from the FCCU due to the installation of additional air pollution control equipment (new ESPs) through compliance with Rule 1105.1.

- The proposed project is expected to reduce SOx emissions, as well as other combustion-related emissions, from flaring by capturing gas flows to the flare in the flare gas recovery system through compliance with Rule 1118. This will reduce the combustion of gases from the flare.

- Two pressure relief devices in the Coker Gas Debutanizer Unit will be tied into the flare system improving the safety of the system and reducing potential VOC emissions to comply with Rule 1173.

Therefore, following completion of the construction phase, the proposed project is expected to provide an overall beneficial impact on air quality.

4.2.2.4 Toxic Air Contaminants

A health risk assessment (HRA) was performed to determine if emissions of toxic air contaminants generated by the proposed project would exceed the SCAQMD thresholds of significance for cancer risk and is included as Volume II to this EIR. The following section outlines the HRA for the modifications to the Refinery. The results of the HRA will be used to evaluate the impacts of toxic air contaminants from the proposed project. The HRA summarized herein for the proposed project evaluates the emission increases only at the BP Carson Refinery for the Safety, Compliance, and Optimization Project. In order to provide a conservative estimate of health impacts, the HRA did not take credit for any expected emission reductions in TACs (e.g., DEA).

HRA Methodology

The HRA has been prepared in accordance with the August 2003 Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments (OEHHA, 2003) and

the October 2003 Air Resources Board Recommended Interim Risk Management Policy for Inhalation-based Residential Cancer Risk memo (CARB/OEHHA, 2003). The HRA includes a comprehensive analysis of the dispersion of certain AB2588-listed compounds into the environment, the potential for human exposure, and a quantitative assessment of individual health risks associated with the predicted levels of exposure. CARB Hotspots Analysis Reporting Program (HARP) model is the most appropriate model for determining the air quality impacts from the proposed project (CARB, 2005). The HARP model is well suited for refinery modeling since it can accommodate multiple sources and receptors. The HARP model combines the U.S. EPA Industrial Source Complex dispersion model with a risk calculation model based on the Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA, 2003).

Hazard Identification

The operation of the Refinery generates various air contaminants. Some of these chemical compounds are carcinogenic, toxic, or hazardous. Numerous federal, state, and local regulatory agencies have developed lists of toxic air contaminants. The list of potentially-emitted substances considered in the preparation of the HRA for the proposed project is identified in Appendix A-I of the CARB AB2588 requirements and by OEHHA. The AB2588 toxic air contaminants emitted from the proposed project are shown in Table 4-5. Some of these pollutants were consolidated into one category, e.g., polycyclic aromatic compounds (PACs). Health effects data are not available for all compounds. Therefore, a total of 18 toxic air pollutants were included in the air dispersion modeling (see Table 4-5). For carcinogens, slope factors were used to compute cancer risk through inhalation. If the carcinogen is a multi-pathway pollutant, a potency slope was used for estimation of risk from non-inhalation pathways. For non-cancer health effects, reference exposure levels (REL) and acceptable oral doses (for multi-pathway pollutants) were used. The non-carcinogenic hazard indices were computed for chronic and acute exposures with their respective toxicological endpoints shown.

Emission Estimations and Sources

Emission rates for the proposed project are shown in Table 4-5. The emission rates for each source are provided in Appendix A of Volume II. Emission rates are based on 24 hours per day 365 days per year operating schedule.

VOC emission factors for fugitive components installed in conjunction with the proposed project were based on the SCAQMD's latest guidelines for fugitive components, assuming the use of BACT and an inspection and monitoring program (Jay Chen memo, SCAQMD, April 2, 1999). Speciation of VOC emissions was derived from speciation data used by the Refinery for annual emissions reporting and AB2588 reporting.

TABLE 4-5
Maximum Refinery TAC Emissions Rates
For Proposed Project

CHEMICAL	Cas. No	~~Proposed Project~~		*Proposed Project*	
		~~Emissions (lbs/hr)~~	~~Emissions (lbs/yr)~~	*Emissions (lbs/hr)*	*Emissions (lbs/yr)*
1,3-Butadiene	00106-99-0	~~2.99E-04~~	~~2.62E+00~~	*5.90E-04*	*5.17E+00*
Acetaldehyde	00075-07-0	~~3.70E-09~~	~~3.25E-05~~	*7.35E-09*	*6.44E-05*
Ammonia	7664-41-7	~~3.93E-04~~	~~3.44E+00~~	*5.93E-06*	*5.19E-02*
Benzene	00071-43-2	~~9.12E-03~~	~~7.99E+01~~	*4.00E-02*	*3.50E+02*
Chloroform	67-66-3	~~1.79E-07~~	~~1.57E-03~~	*2.61E-07*	*2.28E-03*
Cresols (Mixed Isomers)	01319-77-3	~~1.65E-05~~	~~1.45E-01~~	*2.23E-05*	*1.95E-01*
Diethanolamine (DEA)	00111-42-2	~~6.02E-03~~	~~5.28E+01~~	*9.25E-03*	*8.10E+01*
Ethylbenzene	00100-41-4	~~8.56E-03~~	~~7.50E+01~~	*1.45E-02*	*1.27E+02*
Hydrogen Cyanide	00074-90-8	~~9.74E-09~~	~~8.53E-05~~	*2.59E-09*	*2.27E-05*
Hydrogen Sulfide	07783-06-4	~~1.39E-03~~	~~1.22E+01~~	*3.47E-04*	*3.04E+00*
Methanol	00067-56-1	~~1.37E-03~~	~~1.20E+01~~	*4.16E-01*	*3.65E+03*
Naphthalene	00091-20-3	~~5.46E-03~~	~~4.78E+01~~	*5.54E-03*	*4.85E+01*
n-Hexane	00110-54-3	~~8.98E-02~~	~~7.86E+02~~	*1.98E-01*	*1.73E+03*
PACS	N590	~~1.57E-08~~	~~6.65E+00~~	*4.17E-09*	*3.65E-05*
Phenol	00108-95-2	~~1.32E-05~~	~~1.16E-01~~	*3.14E-05*	*2.75E-01*
Propylene	00115-07-1	~~8.73E-02~~	~~7.65E+02~~	*1.15E-01*	*1.00E+03*
Toluene	00108-88-3	~~3.36E-02~~	~~2.94E+02~~	*6.55E-02*	*5.74E+02*
Xylenes (Mixed Isomers)	01330-20-7	~~3.35E-02~~	~~2.94E+02~~	*7.56E-02*	*6.62E+02*

Carcinogenic Health Impacts

Maximum Exposed Individual Worker (MEIW): The cancer risk estimates are shown in Table 4-6. Based on the air quality modeling and related assumptions, consistent with SCAQMD HRA policy, the cancer risk to the MEIW associated with the proposed project at the Refinery was calculated to be ~~0.24×10^{-6}~~ 0.46×10^{-6} or less than one in a million. This result does not exceed the cancer risk significance threshold of 10 per million (see Table 4-1); therefore, the carcinogenic impacts to the MEIW associated with the exposure to TACs from the proposed project are less than significant. Consistent with SCAQMD HRA policy, the MEIW is based on a 40-year exposure period. Workers are assumed to be exposed for eight hours a day, five days a week, 49 weeks a year, for 40 years. The project MEIW location is shown in Figure 4-1.

TABLE 4-6

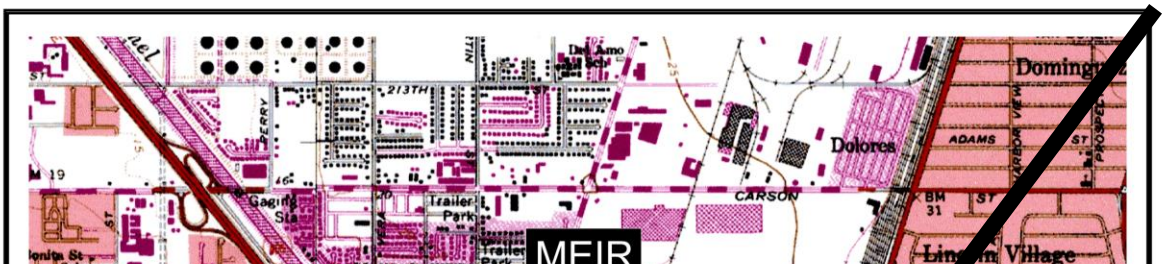
Summary Of Proposed Project Cancer Risk

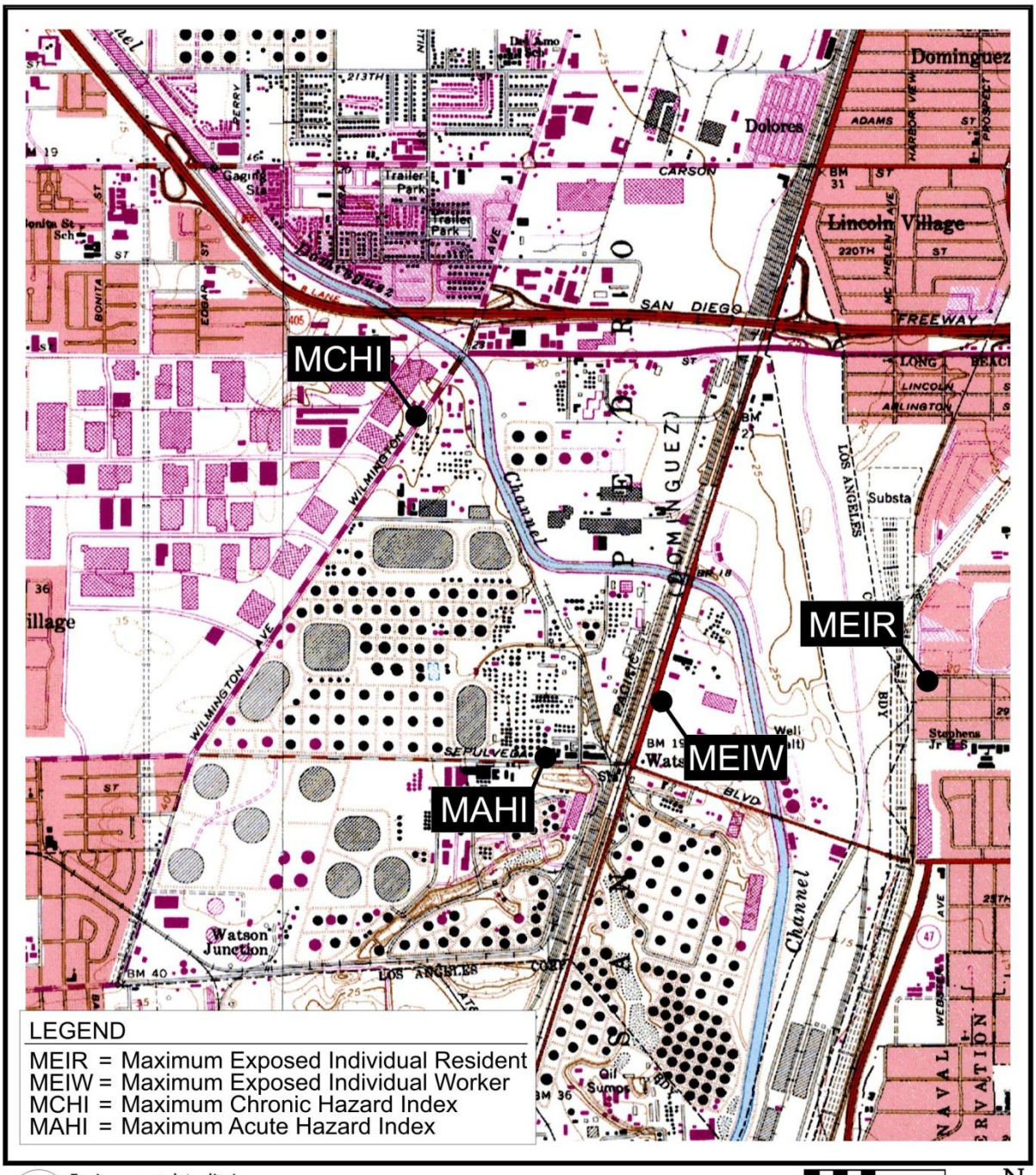
EXPOSURE PATHWAY	~~**Maximum Exposed Individual Resident**~~	~~**Maximum Exposed Individual Worker**~~	***Maximum Exposed Individual Resident***	***Maximum Exposed Individual Worker***
Inhalation	~~2.11E-07~~	~~2.39E-07~~	3.12E-07	4.60E-07
Dermal	~~2.19E-10~~	~~5.64E-10~~	2.34E-12	1.37E-12
Soil Ingestion	~~3.29E-11~~	~~7.34E-11~~	3.51E-13	1.79E-13
Oral	~~2.52E-10~~	~~6.38E-10~~	*5.67E-12*	*1.55E-12*
Ingestion of Home Grown Produce	~~0.00E+00~~	~~0.00E+00~~	*2.97E-12*	*0.00E+00*
Ingestion of Animal Products	~~0.00E+00~~	~~0.00E+00~~	*0.00E+00*	*0.00E+00*
Ingestion of Mother's Milk	~~0.00E+00~~	~~0.00E+00~~	*0.00E+00*	*0.00E+00*
Total Cancer Risk	~~**2.12E-07**~~	~~**2.40E-07**~~	***3.12E-07***	***4.60E-07***

Maximum Exposed Individual Resident (MEIR): The cancer risk estimates are shown in Table 4-6. Based on the air quality modeling and related assumptions consistent with SCAQMD HRA policy, the cancer risk to the MEIR associated with the proposed project at the Refinery was calculated to be ~~0.21 x 10^{-6}~~ *0.31 x 10^{-6}* or less than one in a million. This result does not exceed the cancer risk significance threshold of 10 per million (see Table 4-1); therefore, the carcinogenic impacts to the MEIR associated with exposure to TACs from the proposed project are less than significant. The project MEIR location is shown in Figure 4-1.

Cancer Burden: Typically, a one per million isopleth would be used in the HARP model as a study area to calculate excess cancer burden. Since the cancer risk was less than one per million, no one per million isopleth was prepared. Therefore, the census block containing the maximum residential cancer risk was used to calculate excess cancer burden.

The excess cancer burden for the block was calculated by multiplying the predicted 70-year lifetime risk at the block with the residential population within the census block. The calculated cancer burden from the proposed project is ~~0.00006~~ *0.00003*, which is less than the cancer burden significance threshold in Table 4-1.





MAXIMUM IMPACT LOCATIONS
BP CARSON REFINERY
SAFETY, COMPLIANCE, & OPTIMIZATION PROJECT

Project No. 2393 Figure 4

N:\2393\Maximum Impact Points - HRA (rev.1).cdr

Sensitive Receptors: Other types of sensitive receptors in addition to residences include schools, daycare facilities, and hospitals. None of these types of sensitive receptors are located within 1,000 feet of the Refinery. The MEIR is the maximum sensitive receptor and the health risks to the MEIR are less than significant.

Non-Carcinogenic Health Impacts: In the analyses of non-carcinogenic health effects, it is generally assumed that a threshold exists below which no health impacts are expected. The substances evaluated can produce health effects due to acute or chronic exposures, although the concentration required to produce such effects may vary greatly depending on the compound.

The types of non-cancer health effects resulting from exposure to compounds vary according to the substance, the magnitude of exposure, and the period of exposure. These health effects generally can be classified into acute exposures (short-term exposures) and chronic exposures (long-term exposures, generally years).

Acute Hazard Index: The highest acute hazard index for the proposed project is estimated to be ~~0.009~~ *0.0012* for the ~~central nervous~~ *reproductive* system. The acute health effects are based on maximum hourly emissions of TACs that have acute target endpoints. (See Volume II for further details.) The acute hazard index for the proposed project does not exceed the relevant significance threshold of 1.0 in Table 4-1; therefore, no significant adverse acute health impacts are expected. The maximum acute hazard index is located at the west Refinery property line (see Figure 4-1).

Chronic Hazard Index: The highest chronic hazard index for the proposed project is estimated to be ~~0.012~~ *0.0077* for the central nervous system. (See Volume II for further details.) The chronic hazard index for the proposed project does not exceed the relevant significance threshold of 1.0 in Table 4-1; therefore, no significant adverse chronic health impacts are expected. The maximum chronic hazard index location is approximately 150 feet west of the Refinery just north of the MEIW (see Figure 4-1).

As discussed under the evaluation of criteria pollutants, the analysis in this EIR only describes the potential emission increases associated with the proposed project. The emission reductions associated with increased use of low sulfur gasoline and diesel fuel, the reduction in particulate emissions from the FCCU, the reduced combustion of gases from the flare, and the reduced VOC emissions from the Coker Gas Debutanizer Unit are also expected to reduce potential TAC emissions. Further, the proposed project will phase out the use of DEA (a TAC) and replace it with MDEA, which is not a toxic air contaminant, thus, further reducing potential TAC emissions from the Refinery. Therefore, following completion of the construction phase, the proposed project could have an overall beneficial impact on air quality when taking into consideration the emission reduction potential of the proposed project.

4.2.3 MITIGATION MEASURES

Feasible mitigation measures are required, if available, to minimize the significant air quality impacts associated with the construction phase of the proposed project as the emissions of certain pollutants are considered significant. No mitigation measures are required for the operation phase because all emissions were determined to be less than significant.

Construction Mitigation Measures

The proposed project is expected to have significant adverse air quality impacts during the construction phase. Therefore, the following mitigation measures will be imposed on the to reduce emissions associated with construction activities from heavy construction equipment and worker travel.

On-Road Mobile Sources:

A-1 Develop a Construction Emission Management Plan for the proposed project. The Plan shall include measures to minimize emissions from vehicles including, but not limited to consolidating truck deliveries, prohibiting truck idling in excess of five minutes, description of truck routing, description of deliveries including hours of delivery, description of entry/exit points, locations of parking, and construction schedule.

Off-Road Mobile Sources:

A-2 Prohibit trucks from idling longer than five minutes at the Refinery.

A-3 Use electricity or alternate fuels for on-site mobile equipment instead of diesel equipment to the extent feasible.

A-4 Maintain construction equipment tuned up and with two to four degree retard diesel engine timing.

A-5 Use electric welders instead of gas or diesel welders in portions of the Refinery where electricity is available.

A-6 Use on-site electricity rather than temporary power generators in portions of the Refinery where electricity is available.

A-7 Prior to construction, the project applicant will evaluate the feasibility of retrofitting the large off-road construction equipment that will be operating for significant periods. Retrofit technologies such as selective catalytic reduction, oxidation catalysts, air enhancement technologies, etc., will be evaluated. Such technologies will be required if they are

commercially available and can feasibly be retrofitted onto construction equipment.

A-8 Diesel powered construction equipment will be fueled with an emulsified diesel fuel or an alternative diesel fuel throughout construction of the proposed project, if commercially available.

CARB has established an interim procedure for verification of emission reductions for alternative diesel fuels and has established interim verification for four alternative diesel fuels; PuriNOx diesel fuel developed by Lubrizol Corporation, Aquazole fuel developed by Total FinaElf, emulsified diesel developed by Clean Fuels Technology, and O_2Diesel fuel developed by O_2Diesel Inc. Interim verification for PuriNOx fuel indicates it can reduce NOx emissions by 14 percent and particulate emissions by 62.9 percent. Interim verification for Aquazole indicates it can reduce NOx emissions by 16 and particulate emissions by 60 percent. Interim verification for Clean Fuels water emulsified diesel fuel indicates it can reduce NOx emissions by 15 percent and particulate emissions by 58 percent. Interim verification for O_2Diesel fuel indicates it can reduce NOx emissions by 1.6 percent and particulate emissions by 20 percent.

The use of alternative diesel fuels is considered to be a feasible mitigation measure, if the fuels are commercially available. PuriNOx has been commercially available in southern California and has been used on another construction project at the BP Refinery. Lubrizol has indicated that it will no longer manufacture PuriNOx after January 2007; however, the fuel could continue to be sold if another company purchases the license. The other manufacturers of emulsified diesel fuels (Clean Fuels and Aquazole) have indicated that these materials are not commercially available in southern California. The current manufacturer of the Clean Fuels Technology emulsified diesel fuel (Ecoenergy Solutions) indicated they have plans to have their fuel commercially available by summer 2006. Aquazole, which is distributed by Total, has no current plans to make the fuel available in southern California. O_2Diesel is distributed by PetroDiamond, located in the Port of Long Beach and, therefore, is commercially available. However, construction equipment that operates on O_2Diesel must have their fuel caps replaced because the Reid Vapor Pressure (RVP) of the fuel is higher than normal diesel fuel. Regardless of which fuel is used, it is expected that a temporary fuel storage tank will be located at the Refinery and used to refuel mobile construction equipment for the proposed project. The distributor will refill the temporary fuel storage tanks periodically as needed during the construction period and will also refuel non-mobile construction equipment, such as large cranes, on-site. Truck trips to refill the temporary fuel storage tanks and to refuel non-mobile equipment have been included in the peak day construction estimates.

Prior to the start of construction of the proposed project, BP will verify the availability of alternative diesel fuels and determine that construction equipment operates properly when fueled with an alternative diesel fuel. Minor modifications to the equipment will be made, if necessary. It is expected that an alternative diesel fuel will be used on all major equipment.

A-9 Use low sulfur diesel (as defined in SCAQMD Rule 431.2).[1]

A-10 Suspend use of all construction activities that generate air pollutant emissions during first stage smog alerts.

PM10 Emissions from Grading, Open Storage Piles, and Unpaved Roads:

A-11 Develop a fugitive dust emission control plan. Measures to be included in the plan include, but are not limited to the following: (1) water active construction site three times per day, except during periods of rainfall. Watering construction sites two times per day complies with SCAQMD Rule 403 and provides about a 50 percent emission reduction. Watering construction sites three times per day will reduce PM10 emissions by an additional 18 percent (total control of 68 percent). These control efficiencies were reflected in the project emission calculations so no further emission reduction credit has been taken into account herein; (2) enclose, cover, water twice daily, or apply approved soil binders according to manufacturer's specifications to exposed piles (i.e., gravel, dirt and sand) with a five percent or greater silt content. Implementation of this mitigation measure would reduce PM10 emissions 30 to 74 percent (SCAQMD, 1993); and (3) suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour. The emission reductions associated with this mitigation measure cannot be quantified (SCAQMD, 1993).

Other Mitigation Measures

AQ-12 The Refinery shall investigate measures to reduce the VOC emissions associated with the use of paints for coating the new Refinery equipment. The Refinery shall investigate the feasibility of painting new Refinery equipment at the manufacturer's location prior to delivery to the site to minimize the amount of paint used at the site. The Refinery shall also investigate the use of ~~paints with VOC content less than 3.5 pounds per gallon~~ *SCAQMD Rule 1113 compliant coatings with a VOC content less than 3.5 pounds per gallon, including other industrial maintenance coatings (non-high temperature industrial maintenance coatings) that are limited to 0.83 pounds per gallon (100 grams per liter).*

Other mitigation measures were considered but were rejected because they would not further mitigate the potential significant impacts. These mitigation measures included: (1) provide temporary traffic control during all phases of construction activities (traffic safety hazards have not been identified); (2) implement a shuttle service to and from retail services during lunch hours (most workers eat lunch on-site and lunch trucks will

[1] *The use of low sulfur diesel became a requirement on September 1, 2006 under SCAQMD Rule 431.2 and is now considered a rule requirement rather than a mitigation measure.*

visit the construction site); (3) use methanol, natural gas, propane or butane powered construction equipment (equipment is not CARB-certified or commercially available); and (4) pave unpaved roads (most Refinery roads are paved).

4.2.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The construction emissions are revised in Table 4-7 to account for the expected reductions due to mitigation. Construction emissions for the proposed project for CO, VOCs, and NOx are expected to remain significant following mitigation (see Table 4-7). The construction emissions associated with SOx and PM10 are expected to be less than significant following mitigation. The emission benefits associated with the mitigation measures are based on estimates provided in the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993) and the CARB interim verification emission reductions for PuriNOx diesel fuel. Construction emissions are expected to be short-term and they will be eliminated following completion of the construction phase.

The mitigation measures are expected to result in additional emission reductions and reduce the potentially adverse significant impacts associated with PM10 emissions to less than significant; however, sufficient emission reductions are not expected to reduce the significant CO, VOC, and NOx emissions to less than significant. SOx emissions would remain less than significant prior to mitigation.

TABLE 4-7
Peak Daily Construction Emissions Following Mitigation (lbs/day)

ACTIVITY	CO	VOC	NOx	SOx	PM10
Unmitigated Emissions(1)	1,036	250	1,633	117	208
SCAQMD Threshold Level	550	75	100	150	150
SIGNIFICANT?	YES	YES	YES	NO	YES
Amount Needed to Reduce Emissions Below Significance Level	486	175	1,533	--	58
MITIGATION MEASURES(2)					
Use of Alternative Diesel Fuel(3)	--	--	-214	--	-54
Use Electric Welders	-89	-16	-146	-16	-8
Use of Electricity Instead of Generators	-56	-15	-220	-<1	-8
Total Emission Reductions	-145	-31	-580	-16	-70
Total Emissions After Mitigation	891	219	1,053	101	138
SIGNIFICANT AFTER MITIGATION?	YES	YES	YES	NO	NO

I1) See Table 4-3; (2) Emission reductions were estimated from the SCAQMD (1993) CEQA Handbook. (3) Reduction of 14% for NOx and 62.9% for PM10 emissions from construction equipment, based on January 31, 2001, verification letter from Dean Simeroth, CARB, to Thomas J. Sheahan, Lubizol Corp.

4.3 HAZARDS AND HAZARDOUS MATERIALS

4.3.1 SIGNIFICANCE CRITERIA

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

Non-compliance with any applicable design code or regulation.

Non-conformance to National Fire Protection Association standards.

Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.

Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

Exposure to radiant heat exposures in excess of 1,600 Btu/(hr-ft^2) (the level that creates second degree burns on unprotected skin).

Overpressure exposure that exceeds 1 pounds per square inch (gauge) (psig) (the level that would result in partial demolition of houses)

Flash fire hazard zones that exceed the lower flammable limit (LFL) (the level that would result in a flash fire in the vent a flammable vapor cloud was ignited).

4.3.2 ENVIRONMENTAL IMPACTS

A hazard analysis was conducted for the proposed new and modified units, which is summarized in Table 4-8. The details of the hazard analysis are included in Appendix D.

Table 4-8 lists the potential hazards (fires, explosion overpressure, thermal radiation, or release of hydrogen sulfide) from the new or modified units associated with the proposed project and the results of the modeling for these hazards. Hazard impact results are shown for existing equipment, modified equipment, and new equipment. For each potential release, the distance to the significance threshold level was determined before and after the proposed project modifications (where applicable). For new units, the distance to the threshold level for each release was determined. Most of the proposed modifications do not affect the size or the location of the largest potential release for the specific unit. In other words, most of the potential releases, which would result in the largest hazard zones, already exist for many of the units.

TABLE 4-8
Maximum Hazard Distances For Maximum Credible Event In Each Process Unit/Area

Process Unit/Release		Status of Potential Hazard	Maximum Distance (feet) from Center of Unit to				
			Flash Fire (LFL)	Explosion Overpressure (1.0 psig)	Pool/Torch Fire Thermal Radiation [1,600 Btu/(hr-ft^3)]	H_2S Gas Concentration (30 ppm for 60 min)	SO_2 Concentration (3 ppm for 60 min)
ALKY	Release from liquid line leaving debutanizer overhead accumulator	Existing	780	295	290	--	--
		Modified	795*	295	295**	--	--
	Release from liquid line leaving alkylation contactor feed coalescer	Existing	610	245	350	--	--
		Modified	670**	265**	360**	--	--
FFHDS	Release from cold flash drum	Existing	170	60	190	2,850	--
		Modified	170	60	190	2,750	--
	Release from sour water flash drum	New	30	15	50	755	--
HCU	Release from fractionator overhead line entering absorber	Existing	90	35	100	1,790	--
		Modified	190**	75**	90	1,860*	--
	Release fractionator hot flux condenser	Existing	890	335	670	--	--
		Modified	770	305	540	--	--
SULFUR	Release from combustion gas stream leaving waste boiler (Unit D)	Existing	--	--	--	1,275	3,510
		Modified	--	--	--	1,240	3,490
FCCU	Liquid line leaving extractor	Existing	890	305	530	--	--
		Modified	890	320**	620*	--	--
MEROX	Liquid line leaving extractor	Existing	1,085	405	565	--	--
		Modified	1,370*	510**	415	--	--

* Considered to be a potentially significant adverse impact
** Increase does not extend offsite

With the maximum hazard zones defined for each release, the units can be divided into three categories dependent on their potential to impact the public. The categories are defined as follows:

- **Units with No Potential Existing or Post-Project Off-Site Impacts** (i.e., no new hazard zones would be generated): The process units that fall into this category include the Enhanced Vapor Recovery System, the Coker Debutanizer Relief Project, and the North Area Flare Gas Recovery Project because all represent projects that would capture additional vapor streams.

- **Units with Potential Existing or Post-Project Off-Site Impacts, But Post-Project Impacts Are Less Than or Equal to Existing Impacts:** The units that fall into this category include the Sulfur Plant (SULFUR) and FFHDS (see Table 4-8).

- **Units with Potential Off-Site Impacts** (i.e., the post-project impacts are larger than the existing impacts so that impacts have the potential to migrate off-site): The units that falls into this category includes the Alkylation Unit (ALKY), FCCU, Alkyl Merox Unit (MEROX), and Hydrocracker Unit (HCU) (see Table 4-8).

Four of the existing or modified units have the ability to create a hazard that could extend further off-site including the Hydrocracker Unit, FCCU, Alkylation Unit and Alky Merox Unit. Modifications to the Hydrocracker Unit would result in an increase in the distance that exposure to hydrogen sulfide could extend offsite. Modifications to the FCCU would result in an increase distance that a pool/torch fire could extend offsite. The largest hazard zone increase was for a flash fire due to the modification to the Alky Merox Unit. A flash fire from the Alkylation Unit will be slightly larger (795 versus 780 feet) but the release will impact essentially the same area, which is the BP Refinery and adjacent transportation corridor. The details of the analysis are included in Appendix D. Therefore, the potential hazard impacts associated with the proposed project are considered to be significant because there is the potential for some individuals to be exposed to the potential hazards that exceed the significance thresholds.

Releases from new or modified equipment that result in an increase in the potential off-site exposure (based on the consequence modeling and the given hazard endpoints), do so only under "worst-case" conditions. For the "worst-case" scenarios evaluated to occur, the following conditions must be met: (1) A full rupture of the line occurs; (2) the release does not ignite within minutes of the rupture; (3) the wind speed is low (less than three miles per hour); and (4) the atmosphere is calm. The sequence of events is highly unlikely and only results in an off-site hazard (toxic or flammable vapor dispersion) for a limited number of potential releases.

Operation of the proposed project will not involve the use of flammable substances or hazardous materials that are not currently used at the Refinery nor will it involve the use of flammable substances in locations where they are not currently used. Further, the proposed project will phase out the use of DEA (a TAC) and replace it with MDEA,

which is not considered to be a toxic air contaminant, which reduces hazard impacts associated with the transport, storage and use of DEA, thus, reducing hazards at the Refinery.

Regulatory Compliance

The proposed project modifications will require compliance with various regulations, including OSHA regulations (29 CFR Part 1910) that require the preparation of a fire prevention plan, and 20 CFR Part 1910 and Title 8 of California Code of Regulations that require prevention programs to protect workers that handle toxic, flammable, reactive, or explosive materials.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop Risk Management Programs (RMPs) to prevent accidental releases of these substances. The Refinery has prepared an RMP for the existing Refinery which may need to be revised to incorporate the changes associated with the proposed project. The Hazardous Materials Transportation Act is the federal legislation that regulates transportation of hazardous materials.

Under federal OSHA, regulations have been promulgated that require the preparation and implementation of a Process Safety Management Program (PSM) (40 CFR Part 1910, Section 119, and Title 8 of the California Code of Regulations, Section 5189). A PSM that meets the requirements of the regulations and is appropriately implemented is intended to prevent or minimize the consequences of a release involving a toxic, reactive, flammable, or explosive chemical. The primary components of a PSM include written safety information; performance of process safety analysis; detailed operating procedures; training; and pre-start up safety review for new and modified facilities.

The Refinery will comply with all applicable design codes and regulations, conform to National Fire Protection Association standards, and conform to policies and procedures concerning leak detection containment and fire protection. Therefore, no significant adverse compliance impacts are expected.

Impacts on Water Quality

A spill of any of the hazardous materials (generally petroleum products and by-products from the refining process) used and stored at the Refinery could occur under upset conditions, e.g., earthquake, tank rupture, and tank overflow. Spills also could occur from corrosion of containers, piping and process equipment; and leaks from seals or gaskets at pumps and flanges. A major earthquake would be a potential cause of a large spill or release. Other causes could include human or mechanical error. Construction of the vessels, and foundations in accordance with the Uniform Building Code Zone 4 requirements helps structures to resist major earthquakes without collapse, but result in some structural and non-structural damage following a major earthquake. The Refinery

has emergency spill containment equipment and would implement the spill control measures in the event of an earthquake. Storage tanks have secondary containment capable of containing 110 percent of the contents of the storage tanks. Therefore, the rupture of a tank would be collected within the containment system and pumped to an appropriate storage tank.

Spills at the Refinery facilities would generally be collected within containment facilities. Large spills outside of containment areas at the Refinery are expected to be captured by the process water system where it could be controlled. Spilled material would be collected and pumped to an appropriate tank, or sent off-site if the materials cannot be used on-site. Because of the containment system, spills are not expected to migrate from the facility and potential adverse water quality hazard impacts are considered to be less than significant.

Transportation Hazards

The transportation of hazardous materials can result in offsite releases through accidents or equipment failure. The materials currently transported include sulfur, oxygen, and nonhazardous particulate dust. However, the proposed project is not expected to increase the amount of hazardous materials transported to or from the Refinery. Therefore, no increase in transportation hazards is expected from the proposed project.

4.3.3 MITIGATION MEASURES

The proposed project could result in significant adverse impacts associated with "worst-case" hazards in the Hydrocracker Unit, FCCU, Alkylation Unit and Alky Merox Unit. Therefore, pursuant to CEQA Guidelines §15126.4, this EIR describes "feasible measures which could minimize significant adverse impacts . . ."

There are a number of rules, regulations, and laws that the Refinery has complied or must comply with that serve to minimize the potential adverse impacts associated with hazards at the facility and will minimize the hazards associated with the new units. Under federal OSHA, regulations have been promulgated that require the preparation and implementation of a PSM Program (40 CFR Part 1910, Section 119, and Title 8 of the California Code of Regulations, Section 5189). Risk Management Programs are covered under the California Health and Safety Code Section 25534 and 40 CFR Part 68, and Section 112r, by the Clean Air Act.

A PSM that meets the requirements of the regulations and is appropriately implemented is intended to prevent or minimize the consequences of a release involving a toxic, reactive, flammable, or explosive chemical. A PSM review will be required as part of the proposed project. The primary components of a PSM include the following:

- Compilation of written process safety information to enable the employer and employees to identify and understand the hazards posed by the process;

- Performance of a process safety analysis to determine and evaluate the hazard of the process being analyzed;

- Development of operating procedures that provide clear instructions for safely conducting activities involved in each process identified for analysis;

- Training in the overview of the process and in the operating procedures is required for facility personnel and contractors. The training should emphasize the specific safety and health hazards, procedures, and safe practices; and

- A pre-start up safety review for new facilities and for modified facilities where a change is made in the process safety information.

An RMP is required for certain chemicals at the Refinery. The RMP consists of four main parts: hazard assessment that includes an off-site consequence analysis, five-year accident history, prevention program, and emergency response program. The Refinery's existing RMP will need to be reviewed and revised to include the new and modified Refinery units, and to ensure that no unexpected or adverse interactions with existing systems occur. Such reviews are required as part of the RMP, CalARP, and PSM programs for covered processed. It is expected that such reviews will take place if the threshold quantities of regulated substances are exceeded in any of the nine elements of the proposed project (i.e., modifications to the FFHDS, FCCU, Hydrocracker Unit, Alky Merox Unit, Alkylation Unit, Coker Gas Debutanizer Relief Valve project, SCAQMD Rule 1105.1 compliance, Sulfur Plant, or the enhanced vapor recovery system).

No additional feasible mitigation measures have been identified, over and above the extensive safety regulations that currently apply to the Refinery facilities.

4.3.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The impacts of the proposed project on hazards are expected to be significant prior to mitigation. Compliance with existing regulations and implementation of the recommended safety measures would further minimize the potential impacts associated with a release, but are not expected to eliminate the potential hazard impacts. No additional feasible mitigation measures were identified to further reduce significant adverse hazard impacts. Therefore, hazards and hazardous material impacts generated by the proposed project are expected to remain significant.

4.4 NOISE

4.4.1 SIGNIFICANCE CRITERIA

Impacts on noise would be considered significant if:

The project causes construction noise levels to exceed local noise ordinances or, if the noise threshold is currently exceeded, the project increases ambient noise levels by more than three decibels (dBA) at the site boundary.

The project causes construction noise levels that exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.

The project's operational noise levels would exceed the local noise ordinances 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.

4.4.2 ENVIRONMENTAL IMPACTS

4.4.2.1 Construction Impacts

Heavy construction equipment is required during construction activities associated with the proposed project. The highest noise impacts from construction will be during equipment installation. Examples of noise levels from construction equipment are presented in Table 4-9. These noise sources will operate primarily during daylight hours and will be a source of noise over the approximately two and a half year construction period.

The estimated noise level during equipment installation at the Refinery is expected to be an average of about 85 dBA at 50 feet from the center of construction activity for each unit. The construction activities will occur throughout the Refinery as shown in Figure 2-3. Using an estimated six dBA reduction for every doubling of distance, the noise levels at various locations surrounding the facility are estimated in Table 4-10. Most of the construction noise sources will be located near ground level, so the noise levels are expected to attenuate to a greater extent than analyzed herein as a result of existing structures. Noise attenuation due to existing structures has not been included in the analysis.

The construction activities at the Refinery will be normally carried out during daytime from Monday to Friday. 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 (see Table 4-10, location 4, 9, and 11) are not expected to noticeably increase during construction activities. Noise levels during construction activities at other locations are not expected to exceed one dBA.

TABLE 4-9

Construction Noise Sources

EQUIPMENT	TYPICAL RANGE (decibels)[1]	ANALYSIS VALUE (decibels)[2]
Truck	82-95	82
Front Loader	73-86	82
Backhoe	73-95	80
Vibrator	68-82	80
Air Compressor	85-91	85
Saws	72-82	80
Jackhammers	81-98	85
Pumps	68-72	70
Generators	71-83	85
Compressors	75-87	85
Concrete Mixers	75-88	75
Concrete Pumps	81-85	85
Pile Driving (peaks)	95-107	95
Tractor	77-98	85
Scrapers, Graders	80-93	80
Pavers	85-88	75
Cranes	75-89	85

1. City of Los Angeles, 1998. 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 noise levels from the construction equipment at the Refinery are expected to be within the allowable noise levels established by the Carson noise ordinance (see Table 3-9). The project is not expected to increase the noise levels at residential areas. The noise levels at the closest residential areas are expected to be 63-64 dBA (Locations 4, 9, and 11), which is within the normally acceptable noise range. The noise levels at the other noise monitoring locations are within industrial areas and no significant (audible) increase in noise levels is expected. No significant noise impacts related to project construction are expected. Therefore, the proposed project noise impacts during the construction phase are expected to be less than significant.

TABLE 4-10
Project Construction Noise Levels

Location[(1)]	Baseline Noise Levels (decibels)[(2)]	Distance to Noise Sampling Location from Closest Construction Activities (feet)	Construction Sound Level at Noise Sampling Location (decibels)	Total Sound Level at Noise Sampling Location (decibels)[(3)]	Increased Noise Levels at Noise Sampling Locations due to Construction Activities (decibels)
1	71	2,800	50.5	71.0	0.0
2	75	440	66.5	75.6	0.6
3	72	1,000	59.5	72.2	0.2
4	64	5,440	44	64.0	0.0
5	69	4,120	47.5	69.0	0.0
6	73	1,400	56.5	73.1	0.1
7	74	1,100	59.5	74.1	0.1
8	74	1,320	56.5	74.1	0.1
9	63	3,280	49	63.2	0.2
10	59	5,240	44	59.1	0.1
11	64	4,840	46	64.1	0.1

(1) Refers to the sampling locations identified in Figure 3-2.
(2) Includes all ambient noise sources. Noise levels are from Table 3-7.
(3) The total sound level was calculated using the following formula: $T_{sl}=10\log_{10}(10^{Bsl/10} + 10^{Csl/10})$ where T_{sl} = the total sound level (dBA); B_{sl} = baseline sound level (dBA); and C_{sl} = construction sound level (dBA)

Workers exposed to noise sources in excess of 90 dBA for an eight-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 impact to workers during construction activities is expected.

4.4.2.2 Operational Impacts

The proposed project will add equipment to the existing Refinery so that there will be additional noise sources at the facility. Additional noise sources associated with the proposed project generally include process equipment components such as valves, flanges, vents, pumps, and compressors. Additional noise sources at the Refinery are expected to include the following:

- New compressors and pumps associated with the North Area Flare Gas Recovery project;

- New pumps and compressors associated with the Enhanced Vapor Recovery Project; and

- New pumps and motors associated with modifications to the Hydrocracker Unit.

Refinery operations are continuous over a 24-hour period. The maximum noise level of new equipment added to the Refinery is expected to be limited to 85-90 dBA at three feet in order to comply with OSHA and City noise standards. These noise specifications will be enforced and included as part of the equipment purchase agreement for all new and modified equipment. Given the 85 dBA criteria for Refinery equipment, it is expected that the maximum noise level from several pieces of equipment operating concurrently would be about 90 dBA. The estimated noise levels associated with the proposed project operation are summarized in Table 4-11. Assuming an operational "worst-case" noise level of 90 dBA, and a six dBA noise attenuation for every doubling distance, noise levels would drop off to 60 dBA or less at about 1,000 feet from the sources. Noise generated by project equipment, therefore, would not increase the overall noise levels at the Refinery (when compared to baseline conditions). Therefore, no significant noise impacts related to project operation are expected. The noise levels in the area following completion of the proposed project are expected to be about the same as the current levels.

TABLE 4-11
Project Operational Noise Levels

Location[(1)]	Baseline Noise Levels (decibels)[(2)]	Distance to Noise Sampling Location from New Equipment	Sound Level at Noise Sampling Location (decibels)	Total Sound Level at Noise Sampling Location (decibels)[(3)]	Increased Noise Levels at Noise Sampling Locations due to New Equipment (decibels)
1	71	2,800	50.5	71.0	0.0
2	75	440	68.0	75.8	0.8
3	72	1,000	54.0	72.1	0.1
4	64	5,440	44.5	64.0	0.0
5	69	4,120	47.0	69.0	0.0
6	73	1,400	56.5	73.1	0.1
7	74	1,100	59.5	74.2	0.2
8	74	1,320	56.0	74.1	0.1
9	63	3,280	59.0	63.1	0.1
10	59	5,240	44.0	59.1	0.1
11	64	4,840	46.0	64.1	0.1

(1) Refers to the sampling locations identified in Figure 3-2.
(2) Includes all ambient noise sources. Noise levels are from Table 3-7.
(3) The total sound level was calculated using the following formula: $T_{sl}=10\log_{10}(10^{Bsl/10} + 10^{Csl/10})$ where T_{sl} = the total sound level (dBA); B_{sl} = baseline sound level (dBA); and C_{sl} = construction sound level (dBA)

4.4.3 MITIGATION MEASURES

No significant impacts associated with noise are expected from the proposed project during construction or operational phases, so no mitigation measures are required.

4.4.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The proposed project is expected to comply with local noise ordinance, so no significant impacts on noise are expected.

4.5 TRANSPORTATION/TRAFFIC

4.5.1 SIGNIFICANCE CRITERIA

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

Peak period levels on major arterials within the vicinity of the proposed project site are disrupted to a point where intersections with a LOS of C or worse are reduced to the next lower LOS, as a result of the project for more than one month.

An intersection's volume to capacity ratio increases by 0.02 (two percent) or more when the LOS is already D, E or F for more than one month.

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.

4.5.2 ENVIRONMENTAL IMPACTS

4.5.2.1 Construction Impacts

The following evaluates the construction traffic impacts associated with the Safety, Compliance and Optimization Project at the BP Carson Refinery. The construction of modifications at the Refinery will create additional traffic from travel by construction workers to and from the site, as well as transportation of materials and equipment to the Refinery. Since BP is uncertain about the start date for construction activities related to the FCCU Upgrades, traffic impacts were evaluated based on the potential peak labor force. It was determined that the peak labor force of about 850 workers would be expected to occur if the FCCU turnaround began in January 2007. The estimated peak labor force assuming that the FCCU turnaround would begin in October 2006 results in a work force of about 740 workers. [NOTE: The difference is due to the variation in overlapping projects]. Therefore, traffic impacts were evaluated during the peak traffic day, i.e., peak labor force day. It was determined that peak traffic is expected in February 2008, when the construction activities for a number of project components are expected to overlap. Should BP decided to start the construction activities for the FCCU upgrades at an earlier date, the construction traffic impacts are expected to be lower (see Appendix E).

The traffic analysis (see Appendix E) makes worst-case assumptions regarding traffic flow during construction activities in order to provide a worst-case traffic analysis. The LOS analysis assumes 850 construction workers will be commuting to the Refinery, during peak construction activities, with 650 construction workers expected during the first shift (7:00 AM to 5:30 PM) and 200 workers expected during the second shift (6:30 PM to 5:00 AM). It is expected that most of the construction personnel would commute to the site alone in private automobiles even though BP would encourage construction contractor's employees to organize carpools. The traffic analysis assumes that all construction personnel and delivery trucks would enter the construction parking lot from 223rd Street at Gate 60. Delivery trucks would use gates 7, 16, or 60 depending on the project being constructed. In order to provide a worst-case estimate of traffic impacts, all trucks were assumed to use Gate 60.

It is possible that parking for some construction workers will be provided at an offsite location and workers will be bused into the Refinery. For example, additional parking can be provided at the BP Coke Barn. The traffic analysis assumes that all 850 workers and all delivery trucks enter the Refinery from 223rd Street at Gate 60, providing a worst-case analysis of traffic impacts. Parking some construction workers at an alternative offsite location will disperse traffic throughout the area, reducing the concentration of traffic at the intersections adjacent to the Refinery and reducing the traffic impacts.

Construction activities at the BP Carson Refinery are anticipated to occur five days a week (Monday through Friday). The work shift is scheduled to begin at 7:00 AM and end at 5:30 PM. Traffic attributable to the project construction will arrive at the site before the AM peak traffic period (7:00 to 8:00 AM) would begin and will not affect the

AM peak hour. Traffic for the project will leave at 5:30 PM and is not expected to affect the PM peak hour (4:30 PM – 5:30 PM). In order to provide a worst-case analysis, the traffic analysis will only examine impacts from traffic attributable to the proposed project during the PM peak hour and assumes that the work shift ends during peak traffic conditions.

Half of the project-related traffic (50 percent) is forecast to use the existing freeway system to access the project study area. The remaining 50 percent is forecast to use 223rd street (15 percent), Sepulveda Boulevard (15 percent), Wilmington Avenue (10 percent) and Alameda Street (10 percent).

The daily truck traffic during peak labor employment is forecast to be about 71 trucks per day. Since these would mainly consist of material deliveries, they would be spread throughout the workday with few deliveries occurring during the peak hour. Large project-related equipment (e.g., reactors) will be delivered directly to the Refinery. Smaller project-related equipment (e.g., control valves and electrical parts) that needs to be stored inside is expected to be delivered to an off-site warehouse for temporary storage. The traffic analysis assumes all truck deliveries will be sent to the Refinery, in order to provide a worst-case analysis of traffic impacts. Roadways in the vicinity of the project would be impacted by the project's construction-related traffic.

Table 4-12 shows the predicted proposed project LOS analysis and volume to capacity ratios due to peak construction activities (see Appendix E for the complete traffic analysis). Table 4-12 indicates that two intersections are expected to show a change in the LOS due to the construction phase of the proposed project. The intersection of 223rd Street/Alameda Street/Wardlow Access is expected to change from LOS D to LOS E and the BP Refinery Gate 60/223rd Street intersection will change from LOS B to LOS D. The traffic change at both of these intersections is considered to be significant, if the work shift ends during the peak hour. The LOS at the other local intersections is expected to remain unchanged. However, the proposed project will increase the volume to capacity ratio by more than two percent at two intersections that are currently operating at LOS D. The intersections of Wilmington Avenue/223rd Street, and Alameda Street/Sepulveda Boulevard are currently operating at LOS D. The proposed project would increase the volume to capacity at these two intersections by more than two percent (i.e., 4.7 and 21.6 percent, respectively), resulting in potentially significant increases in traffic, if the work shift ends during peak traffic hours. Therefore, the proposed project impacts on traffic during the construction phase would be considered significant, if the work shift ends during peak traffic hours. However, it is expected that the proposed work shift (7 AM to 5:30 PM) would generally avoid the peak morning and evening peak hours, which would mitigate traffic impacts. The work shift will end at 5:30 PM and workers will need additional time to gather belongings, get to their vehicles, and depart the site; therefore, they would be leaving the Refinery between 5:30 and 6:30 PM. Any transport of heavy construction equipment or oversized Refinery equipment that will require oversized or over weight transport vehicles on state highways will require a Caltrans Transportation permit.

The construction phase is not expected to result in an increase or decrease in marine vessel or rail traffic.

TABLE 4-12

BP Carson Refinery Construction Traffic Impacts Level of Service Analysis And Volume-To-Capacity Ratios

INTERSECTION	BASELINE (1)		IMPACTS		
	PM LOS	Peak Hour V/C	PM LOS	Peak Hour V/C	Change in V/C
Wilmington Ave. & I-405 NB on/off ramps	C	0.703	C	0.713	0.010
Wilmington Ave. & I-405 SB on/off ramps	B	0.609	B	0.672	0.063
Wilmington Ave. & 223rd St.	D	0.841	D	0.887	0.047(2)
Wilmington Ave. & Watson Center	B	0.668	B	0.689	0.021
Wilmington Ave. & Sepulveda Blvd.	E	0.902	E	0.902	0.000
Alameda Street & I-405 NB ramp	A	0.538	A	0.552	0.014
Alameda St. & 223rd St./Wardlow Access	A	0.409	A	0.476	0.067
Alameda St. & Sepulveda Blvd.	D	0.846	D	0.888	0.042(2)
I-405 SB on/off ramps & 223rd St./Wardlow	A	0.510	A	0.564	0.054
223rd St. & Alameda St./Wardlow Access	D	0.845	E	0.911	0.066(2)
BP Refinery Gate 16 & 223rd St.	C	0.751	C	0.754	0.003
BP Refinery Gate 60 & 223rd St.	B	0.651	D	0.867	0.216(2)

Notes: (1) = based on projected year 2008 traffic data, which assumed 0.25 percent growth per year.
(2) = potentially significant impact
V/C = Volume to capacity ratio (capacity utilization ratio)
LOS = Level of Service

4.5.2.2 Operational Impacts

The proposed project will increase the permanent number of workers at the Refinery by four additional workers. The increase in the number of workers is minor as the local streets typically handle vehicle trips in the magnitude of 25,000 or more vehicles per day.

The proposed project will result in a maximum increase in truck traffic of about eight additional truck trips per day traveling to/from the Refinery. Since these would mainly consist of material deliveries, they would be spread throughout the workday with few deliveries occurring during the peak hour. Therefore, their contribution to overall traffic impacts would be negligible. Therefore, no significant impacts to traffic during operation of the proposed project are expected.

4.5.3 MITIGATION MEASURES

Project construction traffic is expected to result in a significant adverse impact at the intersections of Wilmington Avenue/223rd Street, Alameda Street/Sepulveda Boulevard, 223rd Street/Alameda Street/Wardlow Access, and the BP Refinery Gate 60/223rd Street, if the work shift ends during the evening peak hours. The following mitigation measure would reduce traffic impacts to less than significant.

T-1 The hours for the construction work shifts shall avoid starting or ending the shift during the peak traffic hours of 7:00 AM to 8:00 AM and 4:30 PM to 5:30 PM. This will avoid workers traveling during the peak traffic hours and eliminate potentially significant traffic impacts.

The hours for the first construction shift are expected to be 7:00 AM to 5:30 PM and the hours for the second shift are expected to be 6:30 PM to 5:00 AM. These work shifts will generally avoid peak traffic hours. The peak construction period of 850 workers is expected to be brief as the FCCU turnaround (scheduled for February 2008) is only expected to last about one month. About 600 workers are expected to be required for about two to three months prior to the FCCU turnaround and for about two months after the FCCU turnaround. During the rest of the construction period about 475 employees or less will be required. Therefore, the peak construction traffic conditions are expected to occur for a limited time only.

4.5.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The potentially significant adverse transportation and traffic impacts during the construction period of the proposed project are expected to be mitigated to less than significant.

4.6 OTHER CEQA TOPICS

4.6.1 GROWTH-INDUCING IMPACTS OF THE PROPOSED PROJECT

CEQA defines growth-inducing impacts as those impacts of a proposed project that "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects, which would remove obstacles to population growth" (CEQA Guidelines §15126.2(d)).

The proposed project is not expected to foster population growth in the area, nor will additional housing or infrastructure be required. The project involves the modification of existing industrial facilities. No new services will be required; therefore, no infrastructure development or improvement will be required, and no population growth will be encouraged as a result of the project. It is expected that construction workers necessary to build new, or modify existing equipment will be largely drawn from the existing workforce pool in southern California. Further, operation of the proposed

project is expected to require four additional Refinery workers, which can also be drawn from the existing workforce in southern California.

The proposed Refinery modifications are associated with enhancing safety, complying with air pollution control rules, or optimizing the operation of the existing Refinery. Most of the project components are related to FCCU modifications and the subsequent changes to other related units. The proposed project will not cause an increase in crude throughput and is not expected to result in growth-inducing impacts.

4.6.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES AND ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

CEQA requires an EIR to discuss significant environmental effects (CEQA Guidelines §15126.2(b)) and irreversible environmental changes (CEQA Guidelines §15126.2(c)), which would result from a proposed project, should it be implemented. Significant adverse impacts are impacts that would exceed established threshold levels (e.g., air emissions would exceed SCAQMD established threshold levels). Irreversible changes include a large commitment of nonrenewable resources, committing future generations to specific uses of the environment (e.g., converting open spaces into urban development), or enduring environmental damage due to an accident.

It was determined that implementation of the proposed project would result in potentially significant adverse impacts on air quality during construction. These emissions are temporary and will cease following completion of construction activities. Operational air quality impacts of both criteria pollutants and toxic air contaminants are not expected to have a significant adverse impact on the environment. The analysis in this EIR only describes the potential emission increases associated with the proposed project. The emission reductions associated with increased use of low sulfur gasoline and diesel fuel, the reduction in particulate emissions from the FCCU, the reduced combustion of gases from the flare, and the reduced VOC emissions from the Coker Gas Debutanizer Unit are also expected to reduce potential criteria and TAC emissions. Further, the proposed project will phase out the use of DEA (a TAC) and replace it with MDEA, which is not a toxic air contaminant, reducing the potential TAC emissions from the Refinery. Following completion of the construction phase, the proposed project may have an overall beneficial impact on air quality. Therefore, the BP Safety, Compliance and Optimization project is not expected to have long-term adverse environmental impacts on air quality.

The proposed project could result in significant impacts related to the "worst-case" hazards associated with modifications to the Refinery, including the Allkylation Unit, FCCU, Hydrocracker Unit, and Alkyl Merox Unit. There are a number of rules and regulations that the Refinery must comply with that serve to minimize the potential impacts associated with hazards at the facility.

Noise and traffic levels are expected to increase during construction, but remain less than significant, or can be mitigated to less than significant. Operational noise and traffic

levels are expected to remain essentially the same as existing levels. Therefore, no significant adverse impacts for noise and traffic are expected during operation of the proposed project.

The proposed project involves modifications to an existing Refinery, located within an industrial area, which has been operating since the 1920's. Therefore, there is no major commitment of nonrenewable resources or changes that would commit future generations to specific uses of the environment.

4.6.3 ENVIRONMENTAL EFFECTS FOUND NOT TO BE SIGNIFICANT

The environmental effects of the BP Safety, Compliance and Optimization Project are identified and discussed in detail in the preceding portions of Chapter 4 of this EIR and in the Initial Study (see Appendix A) per the requirements of the CEQA Guidelines (§15128). The following topics of analysis in this EIR were found to have no potentially significant adverse effects, after mitigation:

Noise
Transportation/Traffic

The following topics of analysis were found to have no potentially significant adverse effects in the Initial Study (see Appendix A):

Aesthetics
Agriculture Resources
Biological Resources
Cultural Resources
Energy
Geology/Soils
Hydrology/Water Quality
Land Use/Planning
Mineral Resources
Population/Housing
Public Services
Recreation
Solid/Hazardous Waste

Potentially significant adverse impacts were identified for air quality during construction activities only and hazard impacts associated with project operation.