CHAPTER 4

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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4.0 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

This chapter assesses the potential environmental impacts of the construction and operation of the Chevron Products Company El Segundo Refinery PRO Project described in Chapter 2.

Chapter 4 evaluates those impacts that are considered potentially significant under the requirements of CEQA, for those environmental areas identified in 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

The NOP/IS (see Appendix A) determined the air quality impacts of the proposed project at the Chevron Products Company El Segundo Refinery as having the potential for significant adverse impacts. Project-specific and cumulative adverse air quality impacts associated with increased emissions of air contaminants (both criteria air pollutants and TACs) during the construction and operation phases of the proposed project have been evaluated in this EIR. Impacts to sensitive receptors have also been analyzed in the EIR. The air quality impacts at the El Segundo Refinery and the surrounding areas are provided in this section.

While the proposed project is expected to emit GHGs, emitting GHGs by a single project into the atmosphere is not itself necessarily an adverse environmental effect. Rather, it is the increased accumulation of GHGs from more than one project and many sources in the atmosphere that may result in global climate change. The resultant consequences of that climate change can cause adverse environmental effects. In virtually every project subject to CEQA review, a project's GHG emissions will be relatively small, even infinitesimal, within the scope of global or even statewide GHG emissions, and, as such, will almost certainly have no significant direct impact on climate change. The project GHG emissions are minimal when compared to statewide GHG emissions. Due to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, it is likely impossible to identify the specific impact, if any, to global climate change from one project's incremental increase in global GHG emissions. As such, the project GHG emissions and the resulting significance of potential impacts are more properly assessed on a cumulative basis. Therefore, the environmental setting and the significance of potential impacts from the proposed project's GHG emissions is determined on a cumulative basis in Chapter 5 - Cumulative Impacts.

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.

The SCAQMD makes significance determinations for construction impacts based on the maximum or peak 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 or peak daily allowable emissions during the operational phase.

Subsequent to the adoption of the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993), the SCAQMD adopted Regulation XX - RECLAIM, which fundamentally changed the framework of air quality rules and permits. The RECLAIM program is a pollution cap-and-trade program which applies to the largest sources of NOx and SOx emissions within the jurisdiction of the SCAQMD. RECLAIM facilities were given an initial emissions allocation that reflected their historical NOx or SOx usage, but that declines yearly to reduce total facility-wide emissions. Operators of RECLAIM facilities are also allowed to buy credits in lieu of reducing facility emissions or sell credits if they control emissions more than required. 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, and that a proposed project would be considered significant if it would cause the facility’s emissions to exceed the

TABLE 4-1

Air Quality Significance Thresholds

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NO_x	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 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 Hazard Index $\geq$ 1.0 (project increment)	
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 $\mu g/m^3$ (recommended for construction)[(b)] 2.5 $\mu g/m^3$ (operation) 1.0 $\mu g/m^3$ 20 $\mu g/m^3$	
PM2.5 24-hour average	10.4 $\mu g/m^3$ (construction)[e] & 2.5 $\mu g/m^3$ (operation)	
Sulfate 24-hour average	1 $\mu g/m^3$	
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

baseline plus the applicable significance thresholds. The SCAQMD has revised and updated the methodology for significance determination for RECLAIM facilities.

Air quality impacts for a RECLAIM facility are considered to be significant if the facility-wide incremental mass daily emissions for NOx and SOx exceed the CEQA significance threshold (i.e., 55 lbs/day for NOx or 150 lbs/day for SOx). The proposed project emissions are considered significant if:

$$(B_{5yr}/365) + I < (E_P + E_F)/365$$

Where:

B_{5yr} = Average facility-wide emissions for the previous five years of operational activity, which is the baseline.

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

E_P = Annual emissions increase associated with the proposed project.

E_F = Projected annual emissions for the facility in the year the proposed project will commence proposed operations.

Air quality impacts are considered to be significant if the incremental mass daily emissions for NOx and SOx from all proposed project sources, when added to the projected annual emissions for the facility for the year in which the project will commence operations (e.g., 2010 for Chevron), will be greater than the facility's five-year average emissions (i.e., baseline) plus the significance threshold (i.e., 55 lbs/day for NOx and 150 lbs/day for SOx). In order to make this calculation, the facility's five-year average annual emissions as well as the project's incremental annual emissions are converted to daily emissions by dividing by 365. As discussed in Chapter 3, a five-year Refinery baseline provides a reasonable period of time to take into consideration the variability of the refining operations, e.g., unit shutdowns for maintenance or repair, equipment replacement/repair, equipment failures, etc.

The significance determination methodology described above only applies to NOx and SOx emissions and not to pollutants (i.e., VOC, CO, PM10, and PM2.5) for which the SCAQMD does not regulate under the RECLAIM program. The level of emissions at which CEQA significance is triggered for NOx and SOx emissions at the Refinery ($(B_{5yr}/365) + I$) is calculated in Table 4-2.

TABLE 4-2

Determining Significance for NOx and SOx Pollutants at the Chevron El Segundo Refinery

Pollutant	B_{5yr} 5-Year Average (lbs/yr)(1)	$B_{5yr}/365$ 5-Year Average (lbs/day)	I Significance Threshold (lbs/day)	$B_{5yr}/365$ + I (lbs/day)
NO_x	2,022,400	5,540.8	**55**	**5,596**
SO_x	1,757,200	4,814.2	**150**	**4,965**

(1) See Table 3-3.

4.2.2 ENVIRONMENTAL IMPACTS

4.2.2.1 Construction Emission Impacts

Regional Impacts

Construction emissions are expected from the following equipment and processes:

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

Construction emissions were calculated for peak day construction activities in each month construction is expected to occur. 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. Therefore, peak day emission calculations, presented in Appendix B and summarized in Table 4-3, were based on the schedule presented in Figure 2-5. 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 except PM10 and PM2.5 are expected to occur in January 2009 with peak PM10 and PM2.5 emissions expected to occur in August 2008 assuming that the project adheres to the schedule presented in Figure 2-5. Detailed construction emissions calculations are provided in Appendix B.

TABLE 4-3

Chevron El Segundo Refinery
Peak Construction Emissions(1)
(lbs/day)

ACTIVITY	CO	VOC	NOx	SOx	PM10	PM2.5(2)
Construction Equipment	372.32	117.85	671.58	0.66	30.79	17.86
Vehicle Emissions	336.67	34.60	82.69	0.38	2.34	1.36
Fugitive Dust From Construction(3)	--	--	--	--	128.25	74.39
Fugitive Road Dust(3)	--	--	--	--	15.63	9.07
Architectural Coatings(4)	--	--	--	--	--	--
Total Construction Emissions(5)	**708.99**	**152.45**	**754.27**	**1.04**	**177.01**	**102.36**
SCAQMD Threshold Level	550	75	100	150	150	55
Significant?	Yes	Yes	Yes	No	Yes	Yes

(1) Peak emissions for all pollutants predicted to occur during January 2009, except for PM10 and PM2.5 which occur in August 2008. Peak construction emissions are based on concurrent activities from the PRO Project and SCE and WBMWD upgrades.
(2) PM2.5 is determined using SCAQMD, 2006. Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 CEQA Significance Thresholds, SCAQMD, October 2006, https://www.aqmd.gov/ceqa/handbook/PM2_5/pm2_5ratio.xls
(3) Assumes application of water three times per day.
(4) Paint specifications for this project call for non-VOC containing coatings.
(5) The emissions in the table may differ slightly from those in Appendix B due to rounding.

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. The equipment is assumed to be operational between two and ten 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 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) or Construction Equipment Emissions tables available on the SCAQMD webpage (http://aqmd.gov/

ceqa/hdbk.html). Estimated emissions from construction equipment used for construction activities are included in Table 4-3.

Vehicle Emissions

Vehicle emissions include construction workers' vehicles, 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. Nine hundred workers are expected to be needed during the peak construction period (i.e., activity at all proposed units). Emission calculations were estimated assuming the 900 workers traveling to the site each weekday during January 2009, which is the month when all construction emissions except PM10 and PM2.5 are expected to be the highest (see Appendix B). 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 EMFAC2007 emission factors developed by CARB.

All pickup trucks used for short trips within and near the Refinery are assumed to travel 10 miles per trip. Buses will be used for delivering workers from parking areas to the Refinery. All buses were assumed to travel 60 miles per day.

Medium and heavy diesel trucks include boom trucks, stakebed trucks, flatbed trucks and delivery trucks. Heavy heavy-duty semi trucks were also included in the project construction analysis. Primary emissions generated will include exhaust emissions from diesel engines while operating. Emission calculations were estimated assuming a maximum of 46 trucks traveling to the site each day during months with peak construction emissions. Emissions from trucks (both light-duty and heavy-duty) were calculated using the EMFAC2007 emission factors developed by CARB. Estimated emissions for all 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 pursuant to SCAQMD Rule 403. Application of water reduces PM emissions by a factor of approximately 34 to 68 percent (SCAQMD, 1993). It is assumed herein that one water application per day reduces PM 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 and PM2.5 emissions during peak construction activities for fugitive dust sources are 128.25 pounds per day and 74.39 pounds per day, respectively (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 determine the appropriate silt loading. No travel on unpaved roads is expected because the roads within the Refinery are paved. The estimated PM10 and PM2.5 emissions during peak construction activities (August 2008) from trucks and passenger autos for fugitive dust on paved roads are 15.63 pounds per day and 9.07 pounds per day, respectively (see Table 4-3 and Appendix B, Table B-4).

Architectural Coatings

The project specifications call for painting of vessels and piping with a paint that does not contain VOCs. As supported by extensive research with architectural coatings by the SCAQMD, there are sufficient industrial coatings formulated with high solids and zero VOCs to accommodate the project. Therefore, no 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 levels of contamination are currently unknown. VOC contaminated soil is defined as soil which registers 50 parts per million or greater per the requirements of SCAQMD Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil. If VOC contamination is found, soil remediation must occur under an SCAQMD-approved Rule 1166 Plan to assure the control of fugitive emissions which generally includes covering soil piles with heavy plastic sheeting and watering activities to assure the soil remains moist. Soil remediation activities are under the jurisdiction of the RWQCB and it may be necessary for the RWQCB and SCAQMD to coordinate in order to assure air quality impacts are adequately mitigated.

Construction Emission Summary

Construction activities associated with the modifications to the Refinery would result in emissions of CO, VOC, NOx, SOx, PM10, and PM2.5. Construction emissions for the proposed project are summarized in Table 4-3, together with the SCAQMD's daily construction significance threshold levels. The construction phase of the Refinery's proposed project will exceed the significance thresholds for CO, VOC, NOx, PM10, and PM2.5. Therefore, unmitigated air quality impacts associated with construction activities are considered significant.

Localized Construction Impacts

The SCAQMD has developed Localized Significance 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 CO, NO_2, PM10, and PM2.5 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 assumptions used in the modeling are provided in Appendix B.

To determine the significance of construction PM10 and PM2.5 emissions, project emissions are compared to 10.4 $\mu g/m^3$, which is comparable to the requirement in Rule 403. PM10 and PM2.5 are evaluated differently than CO and NO_2 because PM10 and PM2.5 in nearly the entire district exceed the state or federal PM10 and PM2.5 standards. For CO and NO_2, which are in attainment with all state and national 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 ambient air quality standard. The results are shown in Table 4-4 (see Appendix B for more detailed calculations).

The LST analysis indicates that NO_2, CO, PM10, or PM2.5 emissions do not exceed the LST in Table 4-1 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. Operational emissions include both stationary and mobile sources. Stationary sources include

TABLE 4-4

Localized Significance Threshold Evaluation for Construction Emissions

Criteria Pollutant	Averaging Period	Ambient Back-ground Conc. (ug/m^3)	Calculated Conc. (ug/m^3)	Total Conc. (ug/m^3)	Most Stringent Air Quality Standard (ug/m^3)	Localized Significance Threshold (ug/m^3)	Exceeds Threshold?
CO	1-hour	6896.4	179.1	7075.5	23000		No
	8-hour	5057.4	68.9	5126.3	10000		No
NO_2	1-hour	188.8	187.7	376.5	500		No
	Annual	29.3	4.7	34.0	100		No
PM10	24-hour		9.7			10.4	No
PM2.5	24-hour		<9.7(1)			10.4	No

(1) Since PM2.5 emissions are a fraction of PM 10 emissions and the significance thresholds are the same for PM10 and PM2.5, PM2.5 emissions were not modeled.

combustion sources and fugitive sources. Detailed operational emission calculations are provided in Appendix C. The total operational emissions from the proposed project are identified in Table 4-5. The primary sources of emissions are from new units, including sulfur processing facilities (i.e., SWS, SRU, and TGU) and a Vapor Recovery and Safety Flare System, and from modifications to existing Refinery units, including the No. 2 Crude Unit, No. 2 RSU, Minalk/Merox Unit, FCCU, Alkylation Unit, VRDS Unit, ISOMAX Unit, Cogen Train D Facilities, and the Railcar Loading/Unloading Rack, as well as new storage tanks. The proposed new units and modifications at the Refinery are expected to generate emissions primarily from the installation of fugitive components (e.g., pumps, valves, and flanges) with the exception of the new Cogen Train D, TGU, and Safety Flare, which will, in addition to fugitive emissions, generate criteria pollutant emissions from combustion and incineration. Equipment potentially impacted by the proposed project (upstream or downstream) were evaluated to determine if the proposed project would result in an emission increase, even though the equipment is operating within permit limits and no permit modification would be required. Due to the nature of Refinery operations, all equipment will fluctuate in activity levels. However, no other equipment, beyond those evaluated in the proposed project, were identified that would result in an increase in emissions strictly due to the proposed project. Emission increases are also expected due to increases in vehicle trips from mobile sources.

Combustion Sources

The proposed project contains three new combustion sources: the Cogen Train D, TGU, and Safety Flare. Combustion source emissions are calculated based on fuel feed rate and standard emission factors or emission factor guarantees provided by the manufacturer. Detailed emission calculations are presented in Appendix C.

TABLE 4-5

Chevron Products Company El Segundo Refinery
Stationary Source Operational Emissions
(lbs/day)

Sources	CO	VOC	NOx	SOx	PM10	PM2.5[1]
STATIONARY SOURCES:						
MODIFICATIONS						
No. 2 Crude Unit PRDs	--	10.3	--	--	--	--
No. 2 Residuum Stripper Unit PRDs	--	3.4	--	--	--	--
Minalk/Merox Unit PRDs	--	4.1	--	--	--	--
Waste Gas Compressors	--	0	--	--	--	--
FCCU	--	10.8	--	--	--	--
Alkylation Unit	--	15.8	--	--	--	--
VRDS Unit	--	22.6	--	--	--	--
ISOMAX Unit	--	26.7	-555.7[2]	--	--	
Cogen Train D	72.3	48.2	178.4	63.1	0[3]	0[3]
Railcar Loading/Unloading Rack	--	4.7	--	--	--	--
NEW UNITS						
Sulfur Recovery Facilities						
SWS	--	3.0	--	--	--	--
SRU	--	--	--	--	--	--
TGU	304.6	5.1	133.5	139.3	5.7	5.7
Vapor Recovery and Safety Flare System	2.3	3.2	8.4	0.1	0.5	0.5
Additional Storage Facilities	--	45.6	--	--	--	--
Cooling Tower	--	--	--	--	5.8	5.8[4]
Total Stationary Source Emission Increases[5]	**379.2**	**203.5**	**-235.4**	**202.5**	**12.0**	**12.0**
OFF-SITE EMISSION SOURCES:						
New Workers Commuting	3.8	0.4	0.4	<0.01	0.02	0.02
Fugitive Road Dust	--	--	--	--	0.15	0.01
Locomotive Engines	6.3	2.4	46.1	3.92	1.52	1.47
Total Off-Site Emission Increases:	**10.1**	**2.8**	**46.5**	**3.93**	**1.69**	**1.50**
Total Operational Emission Increases: [5]	**389.3**	**206.3**	**-188.9**	**206.4**	**13.7**	**13.6**

(1) PM2.5 is determined by ratio to PM10 using https://www.aqmd.gov/ceqa/handbook/PM2_5/pm2_5ratio.xls, Profiles ID #117, 118, 120, and 393.
(2) Existing ISOMAX furnaces will be retrofitted with low-NOx burners, which will decrease NOx emissions, with no change in firing rate and, thus, no changes in CO, SOx, PM10, or PM2.5 emissions are expected.
(3) Cogeneration Facilities (A, B, C, and D) and Aux. Boiler will be operated under existing permit limits for PM10. Therefore, the addition of Cogen Train D will have no increase in PM10 or PM2.5 emissions.
(4) Cooling tower emissions are assumed to be all PM2.5.
(5) Differences in totals as compared to Appendix C are due to rounding.

Fugitive Emissions

Fugitive emissions will also be associated with modifications at the Refinery. Fugitive VOC emission sources are from process equipment components such as valves, flanges, vents, pumps, drains, and compressors. 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 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.

Additional documentation of the procedures used to calculate the emissions estimates is provided in Appendix C. All new and modified process components are required to conform to the SCAQMD's BACT Guidelines. The estimated emissions presented in Table 4-5 are based on preliminary design information with limited or no BACT applied. Final designs as permitted will include BACT components that will lower the emission estimates from those presented in Table 4-5. 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 as required under SCAQMD Rule 1173. 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 1176.

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 and new Refinery safety flare system, where required, to control VOC emissions.

In addition, emission offsets are required for newly permitted 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 emission increases greater than one pound from stationary sources.

Off-site emission sources are those that are related to the proposed project, but that would not be directly emitted from permitted equipment at the project site, i.e., trucks, worker commute trips, etc. The operation of the proposed project is expected to require 12 new workers, a reduction of two delivery trucks per day, and a maximum of 12 additional railcars at the facility on a daily basis. The emission increases associated with the increased off-site emission sources are shown in Table 4-5.

Total unmitigated operational emissions from the proposed project are summarized in Table 4-5. Unmitigated operational emissions are summarized in Table 4-6, together with the SCAQMD daily operational threshold levels. The operation of the project will exceed the significance thresholds for VOC. Therefore, the air quality impacts associated with operational emissions from the proposed project are significant. The VOC emissions are associated with modifications to the facility and the new storage tanks. Chevron will obtain offsets for the direct VOC emission increases as required by SCAQMD Rule 1303(b)(2)(A). Because VOC is a precursor to ozone, which is a regional pollutant, the VOC offsets, which are based on an established New Source Review program, will reduce the proposed project net contribution to VOC emissions to the 2.8 pounds per day emitted by the additional workers commuting, which is less than significant. The proposed project emissions for CO, NOx, SOx, PM10 and PM2.5 are less than significant.

TABLE 4-6

Chevron Products Company El Segundo Refinery
Stationary Source Operational Emissions Summary
(lbs/day)

Sources	CO	VOC	NOx	SOx	PM10	PM2.5[1]
Significance Determination for Facility-Wide Pollutants						
Project Emissions[1]	--	--	-188.9	206.4	--	--
Projected 2010 Emissions	--	--	4,087.7	1890.4	--	--
Total Facilty-Wide 2010 Emissions	--	--	3,898.8	2,096.8	--	--
5-Year Average + Significance Threshold[2]	--	--	**5,596**	**4,964**	--	--
Significant?	--	--	**NO**	**NO**	--	--
Significance Determination for All Project Non-Facility-Wide Pollutants						
Project Emissions	389.3	206.3	--	--	13.7	13.6
Significance Thresholds	**550**	**55**	--	--	**150**	**55**
Significant?	**NO**	**YES**	--	--	**NO**	**NO**
Emissions Following Mitigation	389.3	2.8[3]	--	--	13.7	13.6
Significant Following Mitigation?	**NO**	**NO**	--	--	**NO**	**NO**

(1) See Table 4-5.
(2) See Table 4-3.
(3) Emissions mitigated with emission offsets for stationary sources.

The 2010 Refinery projected emissions are based on historical operating conditions with projections on future firing rates, and considering the RECLAIM allocation. All of the major Refinery NOx and SOx emission sources are RECLAIM sources and subject to RECLAIM requirements. Other stationary sources are covered by permit requirements or applicable rules/regulations. For example, flares are not RECLAIM sources and flare emissions are not included as part of the RECLAIM allocation. However, flare emissions are regulated by SCAQMD's Rule 1118- Control of Emissions from Refinery Flares. In addition, the 2010 projected emissions include adjustments (either emission increases or decreases) for projects currently under construction, e.g., construction of the SCR on the FCCU.

4.2.2.3 CO Hot Spots

The potential for high concentration of CO emissions associated with truck/vehicle traffic was considered and evaluated per the requirements of the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993). The Handbook indicates that any project that could negatively impact levels of service at local intersections may create a CO hot spot and should be evaluated. The intersection of Aviation Boulevard and El Segundo Boulevard has a potential to have significant traffic impacts during the construction phase (see Section 4.8). A CO Hotspots Analysis was completed using the Bay Area Air Quality Management District Screening Method to assess the impacts of the traffic on CO ambient air quality. The screening analysis is a conservative method that is based on the traffic air quality impact model CALINE and thus is an appropriate method of analysis. The analysis is presented in Appendix B. The CO Hotspots Analysis resulted in CO concentrations of 5,656 $\mu g/m^3$ and 4,074 $\mu g/m^3$ for the one-hour and eight-hour averaging periods, respectively. The results are below the significance threshold established in Rule 1303 of 23,000 $\mu g/m^3$ and 10,000 $\mu g/m$ for eight-hour averaging periods. Therefore, no significant adverse impacts to ambient air quality due to the traffic impact at the intersection are expected and no mitigation is required.

4.2.2.4 Impacts to Ambient Air Quality

Dispersion modeling was used to calculate ambient air concentrations of the criteria pollutants from the project sources which emit NOx, CO, PM10, and PM2.5 emissions and to determine the localized impacts. The ISCST3 model was used to predict the ambient concentrations for NOx, CO, and PM10 (VOC and SOx are not required to be modeled under SCAQMD Rule 1303, Appendix A because they don't normally contribute to localized air quality impacts). Since PM2.5 emissions are a fraction of PM10 emissions and the significance thresholds are the same for PM10 and PM2.5, PM2.5 emissions were not modeled but were based on the modeling results for PM10.

A modeling file was used for NOx, CO, and PM10 with the appropriate averaging times. The emission rates, locations, and groundlevel concentrations are included in Appendix C. Averaging times modeled include 1, 8, and 24 hours and annual. The modeling source parameters are the same as those for the TACs discussed in the following

subsection. The calculated impacts on ambient air concentrations of the modeled criteria pollutants are presented in Table 4-7.

Based on the ISCST3 model, the ground level concentrations of the criteria pollutants of concern will be below significance thresholds. Therefore, no significant adverse localized air quality impacts are anticipated to occur from the proposed project.

4.2.2.5 Toxic Air Contaminants

A health risk assessment (HRA) was performed to determine if emissions of TACs generated by the proposed project would exceed the SCAQMD thresholds of significance for cancer risk and hazard indices and is included as Volume II to this EIR. The following subsections outline the HRA prepared for the modifications to the Refinery. The results of the HRA will be used to evaluate the impacts of TACs from the proposed project. The HRA summarized herein for the proposed project evaluates the emission increases only from the Chevron PRO Project.

TABLE 4-7

RESULTS OF CRITERIA POLLUTANTS AIR QUALITY MODELING

Criteria Pollutant	Averaging Time	Significance Threshold	Calculated Concentrations for Chevron PRO Project(1)	Significant?
Nitrogen Dioxide	1-hour	500 $\mu g/m^3$	271.6 $\mu g/m^3$ (2)	No
	Annual	100 $\mu g/m^3$	30.7 $\mu g/m^3$ (2)	No
Carbon Monoxide	1-hour	23,000 $\mu g/m^3$	4,736.4 $\mu g/m^3$ (2)	No
	8-hour	10,000 $\mu g/m^3$	3,503.9 $\mu g/m^3$ (2)	No
Particulate Matter (PM10)	24-hour	2.5 $\mu g/m^3$	0.65 $\mu g/m^3$ (3)	No
	Annual (geometric mean)	1 $\mu g/m^3$	0.17 $\mu g/m^3$ (3)	No
Particulate Matter (PM2.5)(4)	24-hour	2.5 $\mu g/m^3$	<0.65 $\mu g/m^3$ (3)	No
	Annual (geometric mean)	1 $\mu g/m^3$	<0.17 $\mu g/m^3$ (3)	No

(1) Calculated concentrations are the project impact combined with the background ambient concentrations. See Appendix C for detailed calculations.
(2) Most stringent ambient air quality standard.
(3) From Table 4-1.
(4) PM2.5 emissions are a fraction of the PM10 emissions with the same thresholds. Therefore, since PM10 results are below the significance thresholds, PM2.5 will be also and are not significant.

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). The model default values were modified to conform to the SCAQMD Supplemental Guidelines for Preparing Risk Assessment for AB2588 (SCAQMD, 2005).

Hazard Identification

The operation of the Refinery generates various air contaminants. Some of these chemical compounds are potentially carcinogenic, toxic, or hazardous, depending on concentration or duration of exposure. Numerous federal, state, and local regulatory agencies have developed lists of TACs. 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 TACs emitted from the proposed project are shown in Table 4-8. Some of these pollutants were consolidated into one category, e.g., polycyclic aromatic hydrocarbons (PAHs). Health effects data are not available for all compounds. Therefore, a total of 38 TACs were included in the air dispersion modeling (see Table 4-8). 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

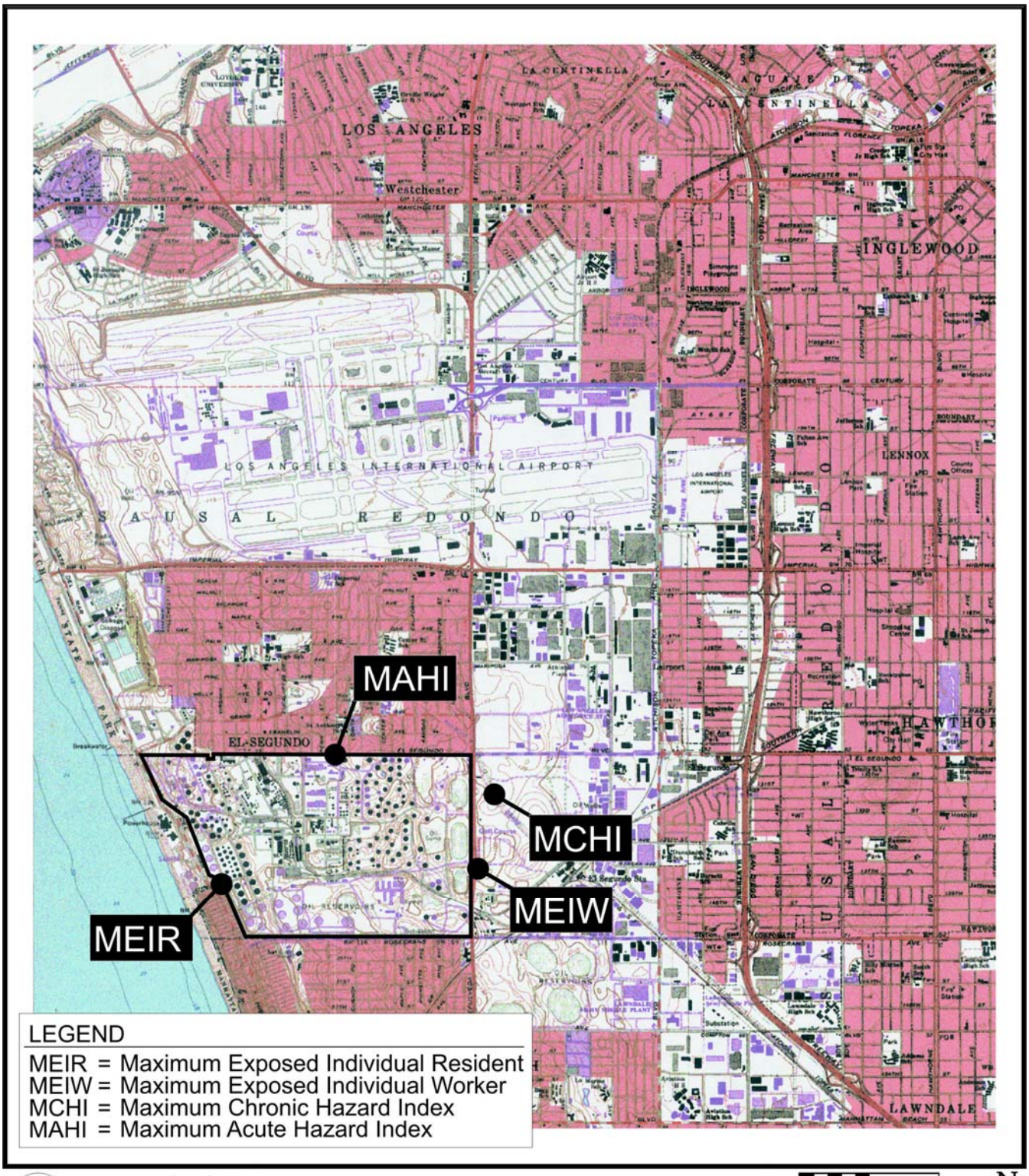
Emission rates for the proposed project are shown in Table 4-8. The emission rates for each source are provided in Appendix A of Volume II. Emission rates are based on operating 24 hours per day and 365 days per year.

TABLE 4-8

Maximum Refinery TAC Emissions Rates From the Proposed Project

CHEMICAL	Proposed Project	
	Emissions (lbs/hr)	Emissions (lbs/yr)
1,2,4-Trimethylbenzene(1)	1.94E-02	1.70E+02
1,3-Butadiene	1.30E-03	9.64E+00
Acetaldehyde	1.23E-02	1.08E+02
Acrolein	1.07E-04	9.34E-01
Ammonia	4.53E+00	3.97E+04
Benzene	2.11E-02	1.84E+02
Benzo[a]pyrene	2.64E-06	2.31E-02
Benzo[b]fluoranthene	3.44E-06	3.01E-02
Benzo[g,h,i]perylene	8.79E-06	7.70E-02
Cadmium	2.87E-04	2.52E+00
Carbon disulfide	1.37E-06	1.20E-02
Carbonyl sulfide	4.22E-06	3.70E-02
Chloroform	6.93E-07	6.07E-03
Chromium	2.29E-03	2.01E+01
Chromium(VI)	6.93E-07	6.07E-03
Cobalt	1.25E-04	1.10E+00
Copper	3.83E-03	3.36E+01
Cyclohexane	1.08E-02	9.46E+01
Ethyl benzene	2.00E-02	1.75E+02
Ethylene	5.30E-02	3.45E+02
Formaldehyde	3.50E-03	3.07E+01
Hexane	5.28E-02	4.63E+02
Hydrogen sulfide	1.09E-01	9.51E+02
Lead	6.47E-04	5.67E+00
Manganese	1.81E-03	1.59E+01
Mercury	3.20E-04	2.81E+00
Methane	8.48E-02	7.43E+02
Naphthalene	1.12E-02	9.79E+01
Nickel	1.47E-03	1.28E+01
PAHs	1.69E-05	1.48E-01
Phenol	4.05E-05	3.55E-01
Phosphorus	1.12E-02	9.82E+01
Propylene	1.73E-01	1.52E+03
Selenium	6.36E-04	5.57E+00
Toluene	6.41E-02	5.62E+02
Vanadium	7.20E-08	6.32E-04
Xylenes (mixed)	8.93E-02	7.82E+02
Zinc	1.68E-02	1.47E+02

(1) Was included in modeling but has no established health effects data.



Environmental Audit, Inc.

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MAXIMUM IMPACT LOCATIONS
CHEVRON PRODUCTS COMPANY - EL SEGUNDO REFINERY
PRODUCT RELIABILITY AND OPTIMIZATION PROJECT

Project No. 2505 Figure 4-1

N:\2505\Maximum Impact Points (HRA).cdr

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.

Carcinogenic Health Impacts

Maximum Exposed Individual Worker: The cancer risk estimates for the MEIW are shown in Table 4-9. 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 0.22×10^{-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 4-9

Summary of Proposed Project Cancer Risk

EXPOSURE PATHWAY	Maximum Exposed Individual Resident	Maximum Exposed Individual Worker
Inhalation	3.05E-07	2.07E-07
Dermal	8.68E-09	9.38E-09
Soil Ingestion	1.39E-09	1.33E-09
Oral		
Ingestion of Home Grown Produce	1.11E-08	0.00E+00
Ingestion of Animal Products	0.00E+00	0.00E+00
Ingestion of Mother's Milk	0.00E+00	0.00E+00
Total Cancer Risk	**0.33E-06**	**0.22E-06**

Maximum Exposed Individual Resident: The cancer risk estimates for the MEIR are shown in Table 4-9. Based on the air quality modeling and related assumptions consistent with SCAQMD HRA policy, based on 70 year exposure, the cancer risk to the MEIR associated with the proposed project at the Refinery was calculated to be 0.33×10^{-6} or less than one in a million. This result does not exceed the cancer risk significance threshold of 10 per million (10×10^{-6}) (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, no excess cancer burden was required to be calculated.

Sensitive Receptors: Other types of sensitive receptors in addition to residences include schools, daycare facilities, and hospitals. The maximum incremental cancer risk increase for a sensitive receptor is 1.62×10^{-7}, which is substantially less than the cancer risk threshold of 10×10^{-6}. This occurs at St. Anthony's School, which is located about 600 feet north of the Refinery.

Ethyl Benzene Carcinogenic Risk: On November 14, 2007, OEHHA established ethyl benzene as a carcinogen. The HARP model has not been updated to reflect this change and does not allow the end user to modify the health risk values used in the model. Therefore, to estimate the impact from ethyl benzene the risk associated with the project benzene emissions was scaled to adjust for the ethyl benzene emission rate and the carcinogenic risk using ratios of emission rates and cancer potency slopes. For the MEIW, ethyl benzene is estimated to contribute 0.002×10^{-6}, which would adjust the cancer risk to 0.22×10^{-6} (no appreciable change). For the MEIR, ethyl benzene is estimated to contribute 0.02×10^{-6}, which would adjust the cancer risk to 0.35×10^{-6}.

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).

Maximum Acute Hazard Index (MAHI): The highest acute hazard index for the proposed project is estimated to be 0.0307 for the central nervous 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 northern Refinery property line (see Figure 4-1).

Maximum Chronic Hazard Index (MCHI): The highest chronic hazard index for the proposed project is estimated to be 0.0066 for the reproductive 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 650 feet east of the Refinery northeast of the MEIW (see Figure 4-1).

4.2.2.6 Summary of Health Impacts

The health impacts related to air quality impacts have been evaluated in several ways. First, the short-term air quality impacts related to construction emissions were evaluated by comparing the peak day construction emissions to the SCAQMD mass daily significance thresholds. In the short-term, the air quality impacts related to construction emissions would exceed the SCAQMD significance thresholds for most pollutants and are considered an adverse significant air quality impact. In order to evaluate the health impacts associated with construction emissions, a LST analysis was also completed. The LST analysis modeled the peak onsite construction emissions to determine the groundlevel concentrations. The results of the LST analysis indicated that the short-term construction emissions would be below the applicable LST criteria. The LST significance criteria are based on the most stringent ambient air quality standard for NO_2, CO, PM10, and PM2.5, and the ambient air quality standards are based on health effects (see Table 3-1). Since construction of the proposed project is short-term and would not exceed the LST significance criteria for local ambient air quality for NO_2, CO, PM10, and PM2.5, no significant adverse health impacts associated with construction emissions are expected. The primarily health effects associated with exposure to NO_2, CO, PM10, and PM2.5 are respiratory impacts including decreased lung function, aggravation of chronic respiratory condition, and aggravation of heart disease conditions. No such adverse health impacts are expected during the construction phase of the proposed project.

Air quality modeling was also completed for the NO_2, CO, PM10, and PM2.5 emission increases associated with operation of the proposed project. The significance thresholds for modeling are based on the most stringent ambient air quality standards and the ambient air quality standards are based on health effects (see Table 3-1). Air quality modeling indicates that emission concentration increases associated with criteria pollutants due to the operation of the proposed project would be less than the applicable significance thresholds and less than ambient air quality standards. Therefore, health impacts associated with the operation of the proposed project are expected to be less than significant. The primary health effects associated with exposure to NO_2, CO, PM10, and PM2.5 are respiratory impacts including decreased lung function, aggravation of chronic respiratory conditions, and aggravation of heart disease conditions. The proposed project is not expected to exceed or contribute to an exceedence of the ambient air quality standards so no such adverse health impacts (respiratory impacts) are expected due to the operation of the proposed project.

Epidemiological analyses have consistently linked air pollution, especially PM, with excess mortality and morbidity. Health studies have shown both short-term and long-

term exposures of ambient PM concentrations are directly associated with increased mortality and morbidity. To estimate potential air quality impacts from a particular facility, the ISC (Industrial Source Complex) model can be used to provide PM10 concentration levels at a set of receptor points. A concentration-response equation can be calculated on the modeled air quality impacts and changes in mortality to determine the relative change in mortality associated with the estimated changes in annual PM levels and estimate the potential for health impacts. For this calculation, it is assumed that all the PM10 is PM2.5. The log-linear form of the concentration response equation is:

$$\Delta \text{ Mortality} = y_0 \, (e^{\beta \Delta PM} - 1) * \text{population}$$

where

y_0 = county level all cause annual death rate per person for ages 30 and older,

β = PM2.5 coefficient from health study,

ΔPM = change in annual mean PM2.5 concentration, and

Population = population of ages 30 and older.

The resulting change in cases of mortality in a population age group living in a specific location with a given change in PM can then be calculated. By applying the census tract level for all census tracts within the modeling domain, the overall estimate in the change in mortality from PM emission of the facility is determined. Since the air quality analysis shows that the onsite PM emissions from the PRO Project do not have offsite consequences (i.e., no concentrations above the ambient air quality standards), the above modeling procedure is not required and, thus, no increase in morbidity or mortality rates or related health effects are anticipated.

The indirect PM emissions associated with the proposed project are limited to an increase in locomotive engines associated with additional deliveries to the Refinery. The emission increase is associated with adding railcars onto existing trains that currently visit the Refinery so the emissions are limited to the increased weight of the train on the locomotive engine, as opposed to an increase in the number of trains. The emissions from trains will be dispersed throughout the district and will not result in localized impacts (e.g., no increase in locomotive idling emissions). Same holds true for PM emissions from new worker vehicles commuting to the Refinery from their homes across the region, thus, dispersing the PM emissions throughout the district. Therefore, no significant air quality or related health impacts are expected due to the proposed project.

The long-term air quality impacts from exposure to toxics were evaluated through the preparation of an HRA. The HRA evaluated the emissions associated with the operation of the proposed project and compared them to carcinogenic and non-carcinogenic significance thresholds to determine potential health impacts. As demonstrated in the HRA, the carcinogenic and non-carcinogenic impacts for all receptors are expected to be less than the significance thresholds. Therefore, no significant adverse carcinogenic or

non-carcinogenic health impacts associated with the operation of the proposed project are expected.

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, except for VOC emissions, which require offsets for stationary sources pursuant to SCAQMD Rule 1303. The offsets are based on an established New Source Review program. Operational VOC emissions from the proposed project that do not require offsets are from mobile source emissions (2.8 lbs/day), which alone are less than significant. Therefore, VOC emissions are mitigated 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 project to reduce emissions associated with construction activities from heavy construction equipment and worker travel.

<u>On-Road Mobile Sources:</u>

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.

<u>Off-Road Mobile Sources:</u>

A-2 Prohibit construction equipment 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. The project has incorporated this measure to the extent predictable, but will continue to implement where opportunities arise.

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. The project has incorporated this measure to the extent predictable, but will continue to implement where opportunities arise.

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 retrofit cranes of 200 hp and greater with diesel particulate filters that will reduce PM10 emissions. In addition, the project applicant will evaluate the feasibility of retrofitting the off-road construction equipment 50 to 200 hp 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 Suspend use of all construction activities that generate air pollutant emissions during first stage smog alerts.

<u>PM10 Emissions from Grading, Open Storage Piles, and Unpaved Roads:</u>

A-9 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 and PM2.5 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 and PM2.5 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

During the course of construction, process units with combustion sources will be shutdown to accomplish the project modifications. Therefore, varying emission reductions will occur. Emission reductions will vary depending on the number of units that are shutdown concurrently. Therefore, while the reductions are quantifiable, the emission reductions do not directly offset peak construction emissions and are not being accumulated as mitigation emissions reductions. Table 4-10 shows the ranges of emission reductions from not operating refinery equipment that are expected to occur during the construction period. Unit shutdowns will vary during the construction period, with a wide range of emission reductions.

TABLE 4-10
EMISSION REDUCTIONS FROM UNIT SHUTDOWNS DURING CONSTRUCTION
(lbs/day)

Pollutant	Range of Emissions Reduction
CO	18 – 2,302
NOx	32 – 1,658
SOx	2 – 848
VOC	4 – 1,858
PM10	4 - 258

Other mitigation measures were considered but were rejected because they would not further mitigate the potential significant impacts. These mitigation measures include: (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 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 already paved).

4.2.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Construction emissions for the proposed project for CO, VOCs, NOx, PM10, and PM2.5 are expected to remain significant following mitigation. The construction emissions associated with SOx are expected to remain less than significant following mitigation. 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 and PM2.5

emissions however, sufficient emission reductions are not expected to reduce the significant CO, VOC, NOx, PM10, and PM2.5 emissions to less than significant. SOx emissions would remain less than significant prior to mitigation.

Localized significant impacts from construction activities were analyzed for NO_2, CO, PM10, and PM2.5. The construction activities associated with the proposed project are not expected to cause a significant adverse impact on ambient air quality and no mitigation would be required. The analysis concluded that construction emissions of NO_2, CO, PM10 and PM2.5 would not exceed applicable LSTs (Table 4-1).

Traffic impacts were analyzed for potential impact to CO ambient air quality and determined that no significant change in the ambient CO air quality is expected as a result of the proposed project. Therefore, the proposed project is not expected to cause CO hotspots and no significant adverse impact on ambient air quality is expected.

The operational impacts of the proposed project are expected to have significant VOC impacts. The proposed project is not expected to have significant impacts to CO, NOx, SOx, PM10, or PM2.5 during operation. VOC emissions are offset for stationary sources pursuant to SCAQMD Rule 1303. The VOC offsets will reduce the proposed project net contribution to VOC emissions to 2.8 pounds per day emitted by the additional workers commuting, which is less than significant. Therefore, after mitigation the proposed project is not expected to cause a potentially significant adverse impact on air quality.

Ambient air quality modeling indicates that the project emissions of NO_2, CO, PM10, and PM2.5 during operation of the proposed project will be below ambient air quality standards. Therefore, the operation of the proposed project is not expected to cause a significant adverse impact on ambient air quality.

The proposed project was analyzed for cancer and non-cancer human health impacts and determined to be less than significant. The estimated cancer risk due to the operation of the proposed project is expected to be less than the significance criterion of 10 per million. The chronic hazard index and the acute hazard index are both below 1.0. Therefore, the proposed project is not expected to cause a potentially significant adverse impact associated with exposure to toxic air contaminants.

4.3 ENERGY

The NOP/IS (see Appendix A) determined the increased electrical demand associated with the proposed project at the Chevron Products Company El Segundo Refinery as having the potential for significant adverse energy impacts. The NOP/IS concluded that potential increased demand for natural gas from the proposed project would not be significant. No comment letters were received disputing this conclusion. Therefore, energy resource impacts with respect to electricity are evaluated in this section.

4.3.1 SIGNIFICANCE CRITERIA

The proposed impacts on energy resources would be considered significant if the following occurs:

- The project requires new off-site energy supply facilities and distribution infrastructure or capacity enhancing alterations to existing facilities.

4.3.2 ENVIRONMENTAL IMPACTS

The proposed project includes equipment that will require additional electricity and produce electricity. The equipment that will require additional electricity as part of the proposed project includes the new FCCU main blower and new pumps, new pumps in the ISOMAX Unit, new compressors in the VRDS and hydrogen compression facilities, and the new equipment associated with the Sulfur Recovery Facilities. The estimated increase in electricity demand associated with the proposed new equipment is about 29.9 MW. Modifications to SCE and WBMWD facilities are not expected to create additional electrical demand.

The Refinery currently operates Cogeneration Facilities to supply most of the electricity and steam used by processing equipment. To supplement electrical needs, electricity is currently purchased from offsite sources (e.g., SCE). The existing Cogeneration Facilities are proposed to be expanded by an additional 49.9 MW and will operate on either natural gas and/or refinery fuel gas. The expansion to the Cogeneration Facilities will allow the Refinery to produce the electricity required to operate the proposed new equipment and to supply most of the electricity demand required to operate the Refinery, so that electricity purchases from SCE will be substantially reduced. Therefore, the long-term impacts on the region's electricity supply are considered to be beneficial because Chevron will be reducing demand for electricity from the grid, while efficiently producing additional energy onsite (see also GHG discussion in Chapter 5).

For a short period of time, Chevron expects that it will need to purchase additional electricity from SCE before Cogen Train D is on-line. Chevron expects that the new FCCU main air blower will be installed and operational in about July 2009, as well as other aspects of the proposed project and the modifications to the Cogeneration Facilities will not be completed until about November 2009. Therefore, there will be about a four to five month period that Chevron may be required to purchase additional electricity from SCE (i.e., slightly less than 29.9 MW). Chevron has discussed this issue with SCE and SCE has indicated that they can supply the increased electrical demand for the period of time that Cogen Train D is under construction. Therefore, based on the above, the short-term impacts on electrical supply are considered to be less than significant.

4.3.3 MITIGATION MEASURES

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

4.3.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

With the new Cogen Train D, the proposed project is expected to generate sufficient electricity to substantially reduce Chevron's demand for electricity from the grid so that no significant energy impacts are expected.

4.4 HAZARDS AND HAZARDOUS MATERIAL

The NOP/IS (see Appendix A) determined that the proposed project at the Chevron Products Company El Segundo Refinery has the potential to generate significant adverse hazards and hazardous materials impacts. The hazards and hazardous material impacts from the PRO Project are evaluated in this section.

4.4.1 SIGNIFICANCE CRITERIA

Hazards and hazardous materials impacts would be considered significant if the following occurs:

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.

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

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

Greater overpressure exposure that exceeds one pound 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 event a flammable vapor cloud was ignited).

4.4.2 ENVIRONMENTAL IMPACTS

A hazard analysis was conducted for the proposed new and modified units, which is summarized in Table 4-11. The details of the hazard analysis are included in Appendix D.

TABLE 4-11

Maximum Hazard Distances for Maximum Credible Event in Each Process Unit(1)

Process Unit/ Release	Status of Potential Hazard (E) Existing (M) Modified (N) New	Maximum Distance (ft) from Center of Unit to			
		Flash Fire (LFL)	Explosion Overpressure	Pool/Torch Fire Thermal Radiation	H_2S Gas Concentration
			1.0 psig	1,600 Btu/(hr ft^2)	30 ppm
FCCU	E	730	--	--	--
	M	755	--	--	--
VRDS	E	--	--	380	--
	M	--	--	130	--
ISOMAX	E	1,145	--	--	--
	M	830	--	--	--
COGEN	E	--	--	70	--
	N	--	--	105	--
SRF	E	--	--	--	5,580
	N	--	--	--	4,390
H2COMP	E	--	135	--	--
	N	--	135	--	--
TANK	E	--	--	340	--
	N	--	--	340	--
SPHERE	E	--	--	5,300	--
	N	--	--	4,750	--
RAILCAR UNLOADING	E	--	--	4,700	--
	N	--	--	4,700	--

(1) See Appendix D for detailed hazard analysis report.
Proposed new units are compared to existing comparable units that are located in the vicinity of the proposed new unit, e.g., Cogen Train D was compared to the existing cogen units.

Table 4-11 lists the potential hazards (fires, explosion overpressure, thermal radiation, or release of H_2S) 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.

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 and Terminals 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 FCCU, VRDS Unit, Cogen Train D Facilities, Hydrogen Compression Facilities, and storage tanks.

- **Units and Terminals 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 ISOMAX Unit, Sulfur Recovery Facilities, the LPG Sphere, and the railcar unloading facilities.

- **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): There are no units that fall into this category.

The conclusions are driven by the nature of the PRO Project in that the replacement of some equipment with more reliable and efficient equipment has little to do with the potential consequence if a release occurs. The consequences are driven by the process conditions at the time of release and the PRO Project is not expected to significantly change those conditions. The consequences of a release will be the same irrespective of the cause of the release (e.g., human error, equipment failure, sabotage, terrorism, natural disaster, or civil uprising). None of the new or modified units have the ability to create a hazard that could extend further off-site. The details of the analysis are included in Appendix D. Historically, catastrophic events involving hazardous materials at refineries are infrequent events, thus, the probability of an occurrence is small. It should be noted that existing maintenance inspections and extensive safety measures and training will further reduce the probability of a catastrophic or hazardous event. Therefore, the potential hazard impacts associated with the proposed project are considered to be less than significant because significance thresholds would not be exceeded. 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.

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 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 HMT 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 PSM Program (40 CFR Part 1910, Section 119, and Title 8 of the California Code of Regulations, Section 5189). A PSM Program 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 and their potential impacts on workers and the surrounding community. The primary components of a PSM Program 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 Refinery drainage 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 to and from the Refinery include sulfur, oxygen, and ammonia. However, the proposed project is not expected to cause an increase in the amount of hazardous materials transported to or from the Refinery by truck. The proposed project is expected to reduce the generation and transport of aqueous ammonia from the Refinery, reducing the transportation hazards related to ammonia. The proposed project is expected to increase the number of railcars by 12 per day of LPG and CARB gasoline blending components. However, these materials are currently shipped and received on a daily basis, so there are no new hazards associated with the increase in railcar deliveries. Therefore, no increase in transportation hazards is expected from the proposed project.

4.4.3 MITIGATION MEASURES

No significant hazard or hazardous materials impacts are expected from the proposed project, so no mitigation measures are required.

4.4.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The proposed project impacts on hazards and hazardous materials are expected to be less than significant.

4.5 HYDROLOGY AND WATER QUALITY

The NOP/IS (see Appendix A) determined the hydrology and water quality impacts of the proposed project at the Chevron Products Company El Segundo Refinery were potentially significant for wastewater treatment facilities and water supply facilities. The potential adverse impacts of the proposed project on wastewater treatment facilities and water supply facilities will be evaluated in this section.

4.5.1 SIGNIFICANCE CRITERIA

The proposed project impacts on hydrology and water quality would be considered significant if the following occurs:

Water Demand:

- The project would exceed the capacity of the existing potable water supply to meet the increased demands of the project; or
- The project increases demand for potable water by more than five million gallons per day.

Water Quality:

- The project will cause degradation or depletion of ground water substantially affecting current or future uses;
- The project will cause the degradation of surface water substantially affecting current or future uses;
- The project would result in a violation of NPDES permit requirements; or
- The project would exceed the capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system.

4.5.2 ENVIRONMENTAL IMPACTS

4.5.2.1 Water Supply

The Refinery currently uses about 2.6 million gpd of fresh/potable water and about 7.4 millions gpd of reclaimed water. The proposed project is expected to require about 400 gpm (about 576,000 gpd) of water for cooling purposes and about 120 gpm (about 172,800 gpd) of boiler feed water. Therefore, the proposed project will increase the water demand at the Refinery by about 520 gpm or about 748,800 gpd.

The proposed project will require the installation of additional eye washes and emergency showers that require potable water near the new units. However, no increase in potable water use is expected as the proposed project is not expected to increase employee emergencies or the number of times that eye washes or emergency showers would need to be used.

The proposed PRO Project includes modifications to the WBMWD utilities to allow the increased production of recycled water that will be used for cooling tower purposes and boiler feed water. All of the increased water use associated with the proposed project (about 748,800 gpd) will be reclaimed water supplied by the WBMWD. Therefore, the proposed project will not result in an increase in the use of potable water, but will only result in an increase in the use of recycled water.

Based on the above, no increase in the use of potable water is expected so no significant impacts to the water supply are expected due to implementation of the proposed project. The proposed project is expected to result in an increase in the use of and production of reclaimed water of about 748,800 gpd. Therefore, no significant impact to the water supply is expected due to implementation of the proposed project.

4.5.2.2 Wastewater Discharges

The Refinery currently discharges approximately seven million gpd of treated wastewater to the Santa Monica Bay. It is expected that the proposed PRO Project will increase the wastewater to the segregated system by about 15 gpm or 21,600 gpd due to increased water injection rates at the ISOMAX Unit. The Project will result in an additional 140 gpm or 201,600 gpd to the unsegregated system associated with blowdown from the new cooling tower, the new heat recovery steam generator at the Cogen Train D and heat recovery boilers at the new SRU and TGU. The total increase in wastewater is about 223,200 gpd.

The volume of wastewater discharged from the Refinery is a fraction of the supply water used as a result of water losses during processing activities (e.g., cooling tower evaporation, steam injection to combustors for NOx reduction at the Cogeneration facilities, and incidental steam losses). The wastewater discharged to the segregated system will continue to be treated using gravity separators, DAF unit, activated sludge units, and auxiliary IAF treatment facilities. The wastewater discharged to the unsegregated system will continue to be treated using API separator and IAF units in compliance with the NPDES permit requirements. Both systems have sufficient capacity to treat the incremental increase in wastewater produced from the proposed project without modifying the existing NPDES permit. Treated wastewater is tested to assure that it complies with the limitations in the NPDES permit prior to being discharged. If the wastewater does not comply with applicable limitations, it is re-treated. Therefore, the proposed project is not expected to change the quality of wastewater produced by the Refinery and no significant impact on water quality is expected.

Under its NPDES Permit, the Chevron Refinery is authorized to discharge up to 8.8 million gpd of treated wastewater during dry weather and up to 23 million gpd during wet weather to the Santa Monica Bay, near Dockweiler State Beach in El Segundo. Currently, the Refinery discharges approximately seven million gpd of treated wastewater during dry weather and approximately 21.5 million gpd during wet weather. Following project completion, the total volume of wastewater discharged would be about 7,223,200 gpd (approximately a three percent increase) during dry weather and 21.7 million gpd during wet weather, which are within the capacities of the existing permit. Therefore, no significant impact associated with wastewater discharge is expected from the proposed project.

4.5.3 MITIGATION MEASURES

No significant impacts associated with water demand and wastewater discharge are expected from the proposed project, so no mitigation measures are required.

4.5.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The proposed project impacts on hydrology and water quality are expected to be less than significant.

4.6 NOISE

The NOP/IS (see Appendix A) determined that the proposed project at the Chevron Products Company El Segundo Refinery has the potential to generate significant adverse noise impacts. Potential noise impacts are evaluated in this section.

4.6.1 SIGNIFICANCE CRITERIA

The proposed impacts on noise would be considered significant if the following occurs:

> 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 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.

4.6.2 ENVIRONMENTAL IMPACTS

4.6.2.1 Construction Impacts

Heavy construction equipment is required during construction activities associated with the proposed project. The highest noise impacts from construction will be during installation of new and modified process units. Examples of noise levels from construction equipment are presented in Table 4-12. These noise sources will operate primarily during daylight hours and will be a source of noise over the approximately one and a half year construction period, with the exception of three months during unit turnaround when two shifts will operate from 5:00 p.m. to 3:30 a.m.

The estimated noise level during installation of new and modified process units at the Refinery is expected to be an average of about 85 dBA at 50 feet from the center of

TABLE 4-12

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 condition, 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.

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 Refinery are estimated in Table 4-13. 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 the daytime from Monday to Friday, with the exception of three months when two construction shifts will be needed. 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 are not expected

TABLE 4-13

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	64.0	1,800	55	64.5	0.5
2	63.3	3,600	49	63.5	0.2
3	69.0	600	64	70.2	1.2
4	68.7	1,200	58	69.1	0.4
5	63.9	1,200	58	64.9	1.0

(1) Refers to the noise monitoring locations identified in Figure 3-3.
(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)

to noticeably increase during construction activities (either during the daytime or nighttime) because noise level increases during construction activities are not expected to exceed 1.2 dBA (see Table 4-13). A noise increase of less than three dBA is generally not noticeable to humans.

The noise levels from the construction equipment at the Refinery are expected to be within the allowable noise levels established by the City of El Segundo noise ordinance (see Table 3-9), i.e., the proposed project is not expected to increase the noise levels in commercial/industrial areas by eight dBA or the noise levels in residential areas by five dBA. The noise levels during the construction phase are generally expected to be similar to current noise levels 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.

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 OSHA/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.

4.6.2.2 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 control valves, vents, pumps, and compressors. Additional noise sources at the Refinery are expected to include the following:

- New gas turbine and related equipment associated with the new Cogen Train D;
- New cooling tower and pumps associated with modifications to the SRU and Alkylation Unit;
- New pumps and compressors associated with the safety flare vapor recovery system;
- New pumps, ejectors, and compressors associated with the modifications to the ISOMAX Unit;
- New pumps, blowers, and compressor associated with the SRU and TGU; and
- Pumps and compressors associated with the SWS and new storage tanks.

Refinery operations are continuous over a 24-hour period. In order to evaluate the potential noise impacts associated with the proposed project, a three dimensional noise model of the PRO Project was created using the noise modeling software SoundPlan. The maximum noise level of new equipment added to the Refinery was estimated based on the Chevron El Segundo Refinery Equipment Noise Specification which is 80 dBA to 85 dBA at three feet. These noise specifications will be enforced and included as part of the equipment purchase agreement for all new and modified equipment. The PRO Project noise levels for individual pieces of equipment were modeled, assuming that all major noise sources to be installed as part of the proposed project were operating simultaneously. Thus the noise impacts are conservative and considered "worst-case" (see Appendix E). The estimated noise levels associated with the proposed project operation are summarized in Table 4-14. Based on the noise model, noise generated by project equipment would increase the overall noise levels at the Refinery by a maximum of about 1.3 dBA (when compared to baseline conditions), which is below the significant impact level of an increase of three decibels. 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. However, as part of ongoing community relations, Chevron will be applying noise attenuation (e.g., noise barriers and mufflers) for some newly installed equipment to minimize the potential increase in noise as part of the proposed PRO Project.

TABLE 4-14

Ambient Noise Levels

Community Noise Equivalent Level	Noise Levels at Each Monitoring Location (CNEL in dBA)				
	1	2	3	4	5
Current Ambient CNEL	63.4	60.4	68.7	68.0	63.8
Predicted PRO Project CNEL	47.6	47.2	62.5	58.9	59.4
Current Ambient CNEL + Predicted PRO Project CNEL	63.5	60.6	69.7	68.5	65.1
Net Project Change in CNEL	0.1	0.2	1.0	0.5	1.3
Significant?	No	No	No	No	No

4.6.3 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.

4.6.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The proposed project is not expected to generate significant adverse impacts noise impacts during construction or operation.

4.7 SOLID AND HAZARDOUS WASTE

The NOP/IS (see Appendix A) determined that the solid/hazardous waste impacts of the proposed project at the Chevron Products Company El Segundo Refinery as having the potential to generate significant adverse solid/hazardous waste generation impacts that could adversely affect disposal facilities. The solid/hazardous waste impacts of the proposed project are analyzed in this section.

4.7.1 SIGNIFICANCE CRITERIA

The proposed impacts on solid and hazardous waste would be considered significant if the following occurs:

- The project results in the generation and disposal of hazardous and non-hazardous waste that exceeds the capacity of designated landfills.

- The project would violate applicable federal, state, and local statutes and regulations related to solid and hazardous wastes.

4.7.2 SOLID AND HAZARDOUS WASTE IMPACTS

4.7.2.1 Construction Impacts

Solid Waste: There would be an increase in the generation of non-hazardous wastes as a result of the demolition of existing structures, grading to provide foundations for new structures, and installing new structures. Based on the amounts of non-hazardous waste generated during construction for previous Refinery modification projects, Chevron estimates that, during the construction of the PRO Project at the Refinery, approximately 1,075 tons of municipal (non-hazardous) solid waste would be generated over a 26-month period. This waste will include approximately 300 tons of non-asbestos insulation, 660 tons of broken concrete, and 115 tons of clean trash and debris.

Solid waste generated during construction of the proposed project will be stored on the Refinery property prior to disposal at one of the landfills in Los Angeles County. Shipments of solid waste to the landfills would be scheduled to avoid exceeding the landfills' permitted daily capacities. The landfills in Los Angeles County have the capacity to accept the waste produced during the construction phase of the proposed project on a one-time basis (see Table 3-10).

Construction activities could uncover hydrocarbon-contaminated soils, given the heavily industrialized nature of the Refinery facilities and the fact that refining activities have been conducted at the site for a number of years. If contaminated soils are encountered during the excavation phase of the proposed project, the soils will be removed for proper decontamination and disposal in accordance with SCAQMD's Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil, and in accordance with a source-specific Clean Up and Abatement Order from the RWQCB for the Refinery. Contaminated soil could be considered either non-hazardous or hazardous waste, depending on the nature and levels of contaminants in the soil. A total of approximately 43,350 cubic yards of soil, with a weight of approximately 52,000 tons, is estimated to be excavated over a total of eighteen months as a result of construction activities for the proposed project. Chevron estimates that a total of approximately 5,900 tons of contaminated soil may be excavated, based on preliminary soil borings. If the entire amount of contaminated soil were considered to be a non-hazardous waste, an additional 5,900 tons of non-hazardous waste would be generated during construction for the proposed project. As a result, the total amount of solid waste generated would be approximately 6,975 tons, which include the contaminated soil and the municipal solid waste.

Hazardous Waste: Construction of the proposed project is anticipated to generate approximately 1,200 tons of hazardous waste, including approximately 730 tons of contaminated trash and debris, 400 tons of sand blasting residue, 60 tons of contaminated metal, and approximately three tons each of paints/solvents and asbestos. Chevron estimates that a maximum of approximately one ton per day of hazardous waste will be generated during the peak construction period.

Additionally, as discussed previously, Chevron estimates that a total of approximately 5,900 tons of contaminated soil may be excavated during construction of the proposed project. If all of the contaminated soil were classified as a hazardous waste, an additional 5,900 tons of hazardous waste would be generated, and the total amount generated would be approximately 7,100 tons of hazardous waste (0.06 percent of permitted capacity).

As indicated in the discussion in subsection 3.7.2, there is adequate capacity at the two Class I landfills in California approved to accept hazardous waste from the proposed project. Together, the two hazardous waste landfills in California have 10.8 million cubic yards of permitted available capacity, which will accommodate the waste generated by the proposed project during the construction phase. In addition, other hazardous waste facilities are located out-of-state. Therefore, the generation of 1,200 to 7,100 tons of potentially hazardous waste is not considered a significant impact.

4.7.2.2 Operational Impacts

As with the current operations at the Refinery, wastes generated by the operation of the proposed project will also be managed and/or disposed of in compliance with applicable federal, state, and local statutes and regulations. The proposed new and modified equipment associated with the proposed project will perform the similar functions as the existing equipment. The proposed project is expected to require increased amounts of catalyst and generate increased amounts of catalyst waste (e.g., associated with the proposed modifications to the ISOMAX Unit, Cogen Train D, and SRU/TGU). The ISOMAX Unit is expected to require about 108 additional tons of catalyst per year. The volume of SRU/TGU catalysts use is currently unknown but the catalysts are expected to require changing every five years. As with the current procedures at the Refinery, the additional amounts of recovered catalyst will be transported for recycling offsite, so no increase in waste disposal of catalyst is expected. Therefore, the proposed project is not expected to result in significant impacts on solid/hazardous waste during project operations.

4.7.3 MITIGATION MEASURES

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

4.7.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The impacts of the proposed project on solid/hazardous waste facilities are expected to be less than significant.

4.8 TRANSPORTATION AND TRAFFIC

The NOP/IS (see Appendix A) determined that the proposed project at the Chevron Products Company El Segundo Refinery has the potential to generate significant adverse transportation and traffic impacts. The traffic impacts associated with the construction and operational phases of the proposed project are potentially significant and the impacts on the transportation system are evaluated in this section.

4.8.1 SIGNIFICANCE CRITERIA

The proposed project will occur at the Chevron Products Company El Segundo Refinery. The proposed impacts on transportation and traffic would be considered significant if the following occurs:

- Peak period levels on major arterials within the vicinity of the proposed project sites 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 projects 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.

4.8.2 ENVIRONMENTAL IMPACTS

4.8.2.1 Construction Impacts

Construction of the proposed project will generate additional traffic from construction personnel commuting to and from the site, as well as the transportation of construction materials and equipment to the Refinery. Construction work shifts are expected to last

about ten hours per day during most portions of the construction schedule. However, during certain Refinery unit shutdown periods (e.g., March and October 2009), two construction shifts are expected. The first shift is scheduled to operate from 6:30 a.m. to 5:00 p.m. and the second shift is scheduled to operate from 5:00 p.m. to 3:30 a.m. Construction workers will be assigned parking lot locations to minimize searching for parking. Construction activities include the delivery of project-related equipment to the Refinery.

The morning peak hour of the adjacent street system surrounding the Refinery is 7:00 a.m. to 9:00 a.m. Because the daytime construction shift starts at 6:30 a.m., worker traffic attributable to project construction will not affect the morning peak hour. The evening peak period is 4:00 p.m. to 6:00 p.m.; therefore, construction related traffic will be leaving and arriving during the evening peak hour and potentially impacting traffic during the evening peak hour. Therefore, the traffic analysis was completed for the evening peak hour only (see Appendix F).

Sufficient parking for the peak estimate of 900 workers is not available at the Chevron Refinery. Chevron estimates that about 340 parking spaces will be available at the Refinery. The additional 500 to 600 workers will park at offsite locations and be transported by bus to the Refinery reducing the traffic impacts at the intersections adjacent to the Refinery. The locations of the off-site parking locations will vary depending on the time of the year. In order to provide a conservative analysis, it is assumed that most of the construction personnel would commute to the site alone in private automobiles even though Chevron would encourage construction contractor's employees to organize carpools. Two different traffic scenarios were evaluated referred to as the Winter and Summer Scenarios, using the assumptions described in the following subsections for the winter and summer time.

Winter Scenario: During the non-summer months (September through May), Chevron construction workers will use the Dockweiler Beach parking area (about 235 vehicles), and two other contract lots:

- The Grand Avenue Courtyard parking structure located on Grand Avenue, east of Sepulveda Boulevard (about 100 vehicles); and

- The Douglas Building parking structure, located on El Segundo Boulevard, west of Douglas Street (about 225 vehicles) (see Figure 4-2).

A traffic analysis was completed for the Winter Scenario assuming that 900 additional construction workers would be required at the Refinery and would use the three parking areas described above (see Appendix F for further details of the traffic analysis). Construction workers will be transported by bus from these locations to the Refinery.

The traffic impacts from the proposed project plus the existing traffic for the Winter Scenario are summarized in Table 4-15. Based on the analysis, the proposed project is

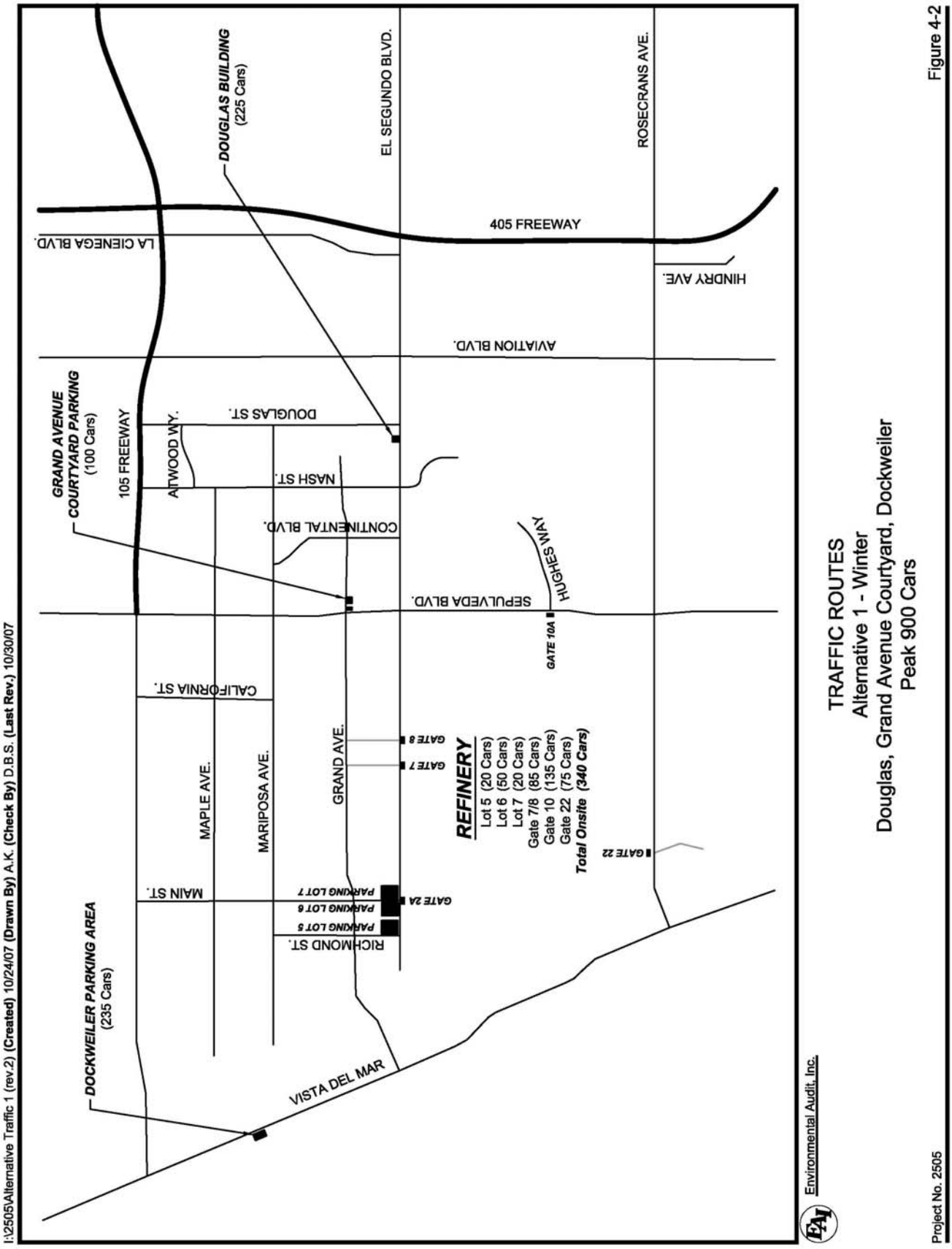

I:\2505\Alternative Traffic 1 (rev.2) (Created) 10/24/07 (Drawn By) A.K. (Check By) D.B.S. (Last Rev.) 10/30/07
DOUGLAS BUILDING
(225 Cars)
EL SEGUNDO BLVD.
ROSECRANS AVE.
405 FREEWAY
LA CIENEGA BLVD.
HINDRY AVE.
AVIATION BLVD.
GRAND AVENUE
COURTYARD PARKING
(100 Cars)
105 FREEWAY
ALWOOD WY.
DOUGLAS ST.
NASH ST.
CONTINENTAL BLVD.
HUGHES WAY
SEPULVEDA BLVD.
GATE 10A
CALIFORNIA ST.
MAPLE AVE.
MARIPOSA AVE.
GRAND AVE.
GATE 8
GATE 7
REFINERY
Lot 5 (20 Cars)
Lot 6 (50 Cars)
Lot 7 (20 Cars)
Gate 7/8 (85 Cars)
Gate 10 (135 Cars)
Gate 22 (75 Cars)
Total Onsite (340 Cars)
GATE 22
MAIN ST.
PARKING LOT 7
PARKING LOT 6
PARKING LOT 5
GATE 2A
RICHMOND ST.
DOCKWEILER PARKING AREA
(235 Cars)
VISTA DEL MAR
Environmental Audit, Inc.
TRAFFIC ROUTES
Alternative 1 - Winter
Douglas, Grand Avenue Courtyard, Dockweiler
Peak 900 Cars
Figure 4-2
Project No. 2505

TABLE 4-15

Chevron Refinery Construction Traffic Impacts Level of Service Analysis and Volume-To-Capacity Ratios (Winter)

INTERSECTION	BASELINE		IMPACTS		
	PM LOS	Peak Hour V/C	PM LOS	Peak Hour V/C	Change in V/C
Sepulveda Blvd. and El Segundo Blvd.	F	1.104	F	1.115	+0.011
Sepulveda Blvd. and Rosecrans Ave.	F	1.070	F	1.086	+0.016
Sepulveda Blvd. and Imperial Hwy.	C	0.718	C	0.722	+0.004
Aviation Blvd. and El Segundo Blvd.	E	0.968	F	1.017	+0.049*
Aviation Blvd. and Rosecrans Ave.	D	0.807	D	0.824	+0.017
La Cienega Blvd. and I-405 SB ramps	B	0.609	B	0.609	+0.000
La Cienega Blvd. and El Segundo Blvd.	B	0.677	C	0.722	+0.045
I-405 SB on-ramp and El Segundo Blvd.	B	0.634	B	0.679	+0.045
I-405 NB ramps and El Segundo Blvd.	A	0.535	A	0.541	+0.006
I-405 SB off-ramp and Rosecrans Ave.	B	0.628	B	0.628	+0.000
I-405 NB ramps and Rosecrans Ave.	B	0.618	B	0.637	+0.019
I-405 SB ramps and Hindry Ave.	A	0.541	A	0.561	+0.020
California St. and Imperial Hwy.	A	0.486	A	0.544	+0.058
Main St. and Imperial Hwy.	B	0.639	B	0.688	+0.049
Continental Blvd. and Grand Ave.	A	0.277	A	0.330	+0.053
Continental Blvd. and Mariposa Ave.	A	0.415	A	0.415	+0.000
Nash St. and Mariposa Ave.	A	0.344	A	0.375	+0.031
Douglas St. and Mariposa Ave.	A	0.482	A	0.524	+0.042
Douglas St. and Atwood Way	A	0.301	A	0.333	+0.032

* Potentially significant traffic impact

expected to result in potentially significant impacts at one intersection, Aviation Boulevard/El Segundo Boulevard. The proposed project is expected to change the LOS at this intersection from E to F. Further, the proposed project would increase the volume to capacity ratio about 0.049 (about 4.9 percent) which exceeds the significance criterion of 0.02 at any intersection with an LOS of D, E, or F. The intersections of Sepulveda Boulevard/El Segundo Boulevard, and Sepulveda Boulevard/Rosecrans Avenue are expected to remain LOS F. In addition, the proposed project will not increase the volume to capacity ratio at these two intersections by 0.02 or more. Most of the other intersections near the Refinery are expected to remain at LOS A, B or C.

To address potential impacts on the freeway system, four segments along the I-105 and I-405 freeways in the project vicinity were examined as the regional freeway segments most likely to be impacted. Traffic volumes attributable to construction worker commuting for the proposed project were analyzed as an incremental increase to the

existing freeway conditions. The LOS values used for freeway segment analyses are estimated by calculating the demand-to-capacity (D/C) ratio and identified by the corresponding LOS definitions. The existing and existing-plus-project freeway conditions are summarized in Table 4-16.

TABLE 4-16

Proposed Project Impact on Surrounding Freeways (Winter)

No.	Freeway Segment	Dir.	Peak Hour	Freeway Capacity[a]	Existing Conditions		Existing + Project Conditions				
					D/C Ratio	LOS	Project Traffic	Peak Hour Volume	D/C Ratio	LOS	Project Impact
1	I-105 between Sepulveda Blvd. and Douglas St.	EB	AM	8,000	0.443	B	0	3,540	0.443	B	0.000
		EB	PM	8,000	0.425	B	419	3,819	0.477	B	0.052
		WB	AM	8,000	0.420	B	0	3,360	0.420	B	0.000
		WB	PM	8,000	0.510	B	0	4,080	0.510	B	0.000
2	I-105 between Douglas St. and I-405 interchange	EB	AM	8,000	0.631	C	0	5,050	0.631	C	0.000
		EB	PM	8,000	0.610	C	419	5,299	0.662	C	0.052
		WB	AM	8,000	0.599	C	0	4,790	0.599	C	0.000
		WB	PM	8,000	0.729	C	0	5,830	0.729	C	0.000
3	I-405 between Rosecrans Av. And El Segundo Blvd.	NB	AM	9,600	1.090	F(0)	0	10,460	1.090	F(0)	0.000
		NB	PM	9,600	1.051	F(0)	98	10,188	1.061	F(0)	0.010
		SB	AM	9,600	1.033	F(0)	0	9,920	1.033	F(0)	0.000
		SB	PM	9,600	1.258	F(1)	228	12,308	1.282	F(1)	0.024*
4	I-405 between El Segundo Blvd. and I-105 interchange	NB	AM	9,600	0.854	D	0	8,200	0.854	D	0.000
		NB	PM	9,600	0.824	D	214	8,124	0.846	D	0.022*
		SB	AM	9,600	0.810	D	0	7,780	0.810	D	0.000
		SB	PM	9,600	0.986	E	135	9,605	1.001	E	0.014

*Potentially significant traffic impact

D/C Ratio	LOS	D/C Ratio	LOS
.00 - .35	A	1.01 – 1.25	F(0)
.36 - .54	B	1.26 - .1.35	F(1)
.55 - .77	C	1.36 – 1.45	F(2)
.78 - .93	D	Above 1.45	F(3)
.94 – 1.00	E		

LOS F(1) through F(3) represent severe congestion (travel speeds less than 25 mph for more than one hour).

[a] Includes HOV lane
[b] D/C Ratio = Demand to Capacity Ratio
Source: See Appendix B for details on the traffic analysis.

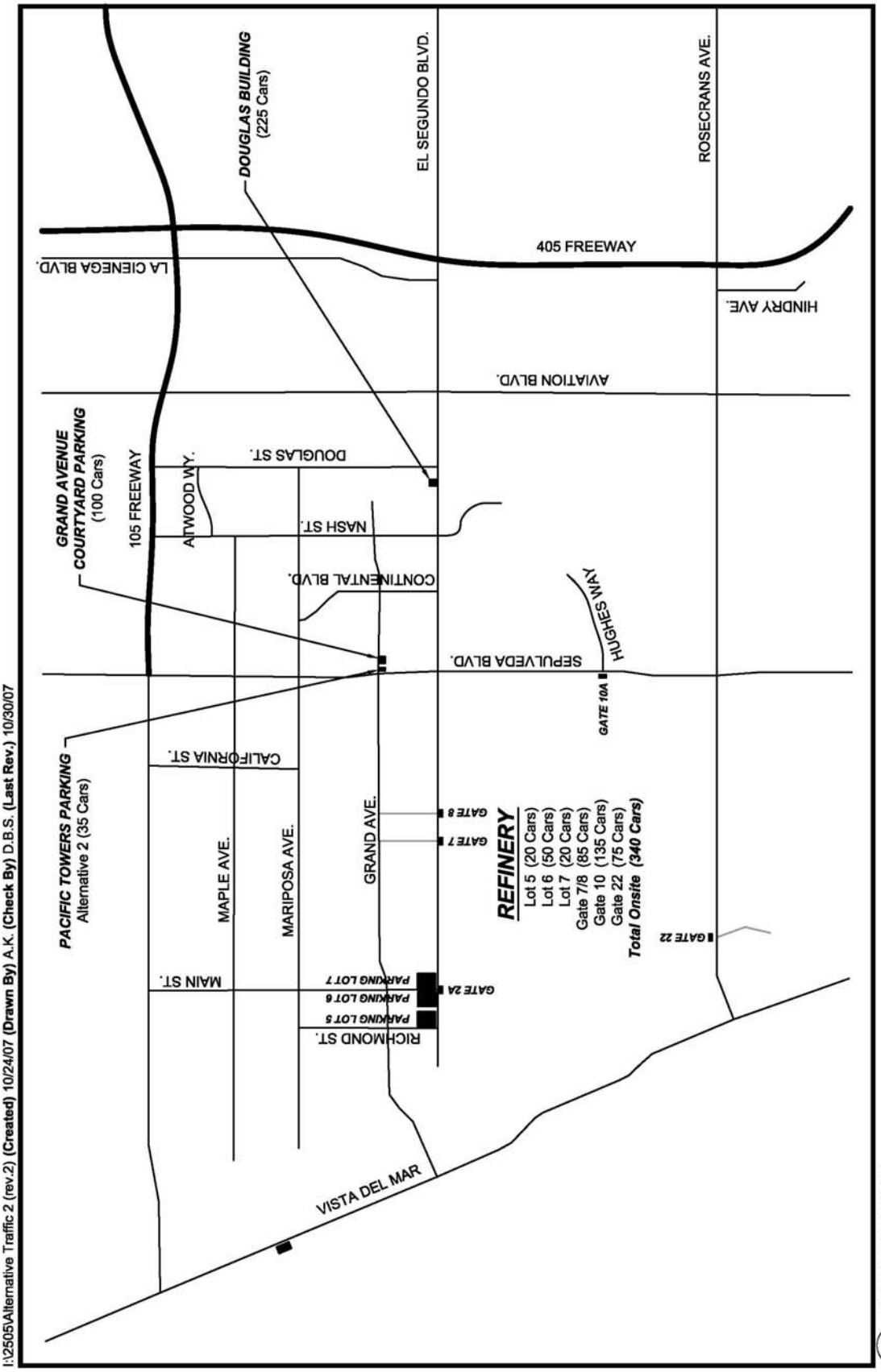
As shown in Table 4-16, construction worker traffic for the proposed project will not cause the LOS on any of the four freeway segments to degrade to level D. However, the proposed project may cause an increase of 0.02 or more for two freeway segments operating at LOS D, E, or F during the construction phase. The southbound lanes of the I-405 between Rosecrans Avenue and El Segundo Boulevard operate at LOS F and the proposed project could increase traffic by about 0.024 during the construction phase. Further, the northbound lanes of I-405 between El Segundo Boulevard and I-105 interchange operate at LOS D and the proposed project could increase traffic by about 0.022 during the construction phase. Therefore, construction worker traffic for the proposed project could result in significant adverse impacts on freeways in the vicinity of the Refinery.

Summer Scenario: During the summer months (June through August), the Dockweiler Beach parking area is not available for project-related construction worker parking. Chevron will continue to park about 340 vehicles at the Refinery and use three other contract lots:

- The Grand Avenue Courtyard parking structure located on Grand Avenue, east of Sepulveda Boulevard (about 100 vehicles);
- The Douglas Building parking structure, located on El Segundo Boulevard, west of Douglas street (about 225 vehicles); and
- The Pacific Towers Parking Structure located near the corner of Grand Avenue and Sepulveda Boulevard (about 35 vehicles) (see Figure 4-3).

A traffic analysis was completed for the Summer Scenario because fewer workers are expected to be required and the Dockweiler parking area is unavailable for construction worker parking during the summer months. A maximum of 700 additional construction workers are expected to be required at the Refinery under the Summer Scenario and would use the parking lots described above (see Appendix F for further details of the traffic analysis). The construction workers will be transported by bus from these parking locations to the Refinery (see Figure 4-3).

The traffic impacts from the proposed project plus the existing traffic for the Summer Scenario are summarized in Table 4-17. Based on the analysis, the proposed project is expected to result in potentially significant adverse impacts at one intersection, Aviation Boulevard/El Segundo Boulevard. The proposed project is expected to change the LOS at this intersection from E to F. Further, the proposed project would increase the volume to capacity ratio about 0.049 (about 4.9 percent) which exceeds the significance criterion of 0.02 at any intersection with a LOS of D, E, or F. The intersections of Sepulveda Boulevard/El Segundo Boulevard, and Sepulveda Boulevard/Rosecrans Avenue are expected to remain LOS F. In addition, the proposed project will not increase the volume to capacity ratio at these two intersections by 0.02 or more. Most of the other intersections near the Refinery are expected to remain at LOS A, B or C.



TRAFFIC ROUTES
Alternative 2 - Summer
Douglas, Grand Avenue Courtyard, Pacific Towers
Peak 700 Cars

Figure 4-3

TABLE 4-17

Chevron Refinery Construction Traffic Impacts Level of Service Analysis and Volume-To-Capacity Ratios (Summer)

INTERSECTION	BASELINE		IMPACTS		
	PM LOS	Peak Hour V/C	PM LOS	Peak Hour V/C	Change in V/C
Sepulveda Blvd. and El Segundo Blvd.	F	1.104	F	1.115	+0.011
Sepulveda Blvd. and Rosecrans Ave.	F	1.070	F	1.086	+0.016
Sepulveda Blvd. and Imperial Hwy.	C	0.718	C	0.722	+0.004
Aviation Blvd. and El Segundo Blvd.	E	0.968	F	1.017	+0.049*
Aviation Blvd. and Rosecrans Ave.	D	0.804	D	0.824	+0.017
La Cienega Blvd. and I-405 SB ramps	B	0.609	B	0.609	+0.000
La Cienega Blvd. and El Segundo Blvd.	B	0.677	C	0.722	+0.045
I-405 SB on-ramp and El Segundo Blvd.	B	0.634	B	0.679	+0.045
I-405 NB ramps and El Segundo Blvd.	A	0.535	A	0.541	+0.006
I-405 SB off-ramp and Rosecrans Ave.	B	0.628	B	0.628	+0.000
I-405 NB ramps and Rosecrans Ave.	B	0.618	B	0.637	+0.019
I-405 SB ramps and Hindry Ave.	A	0.541	A	0.561	+0.020
California St. and Imperial Hwy.	A	0.486	A	0.496	+0.010
Main St. and Imperial Hwy.	B	0.639	B	0.639	+0.000
Continental Blvd. and Grand Ave.	A	0.277	A	0.352	+0.075
Continental Blvd. and Mariposa Ave.	A	0.415	A	0.415	+0.000
Nash St. and Mariposa Ave.	A	0.344	A	0.386	+0.042
Douglas St. and Mariposa Ave.	A	0.482	A	0.539	+0.057
Douglas St. and Atwood Way	A	0.301	A	0.311	+0.043

* Potentially significant traffic impact

The four segments along the I-105 and I-405 freeways in the project vicinity were also examined during the Summer Scenario as the regional freeway segments most likely to be impacted. The existing and existing-plus-project freeway conditions are summarized in Table 4-18 for the Summer Scenario.

As shown in Table 4-18, construction worker traffic for the proposed project will not cause the LOS on any of the four freeway segments to degrade to level D. The proposed project may cause an increase of 0.02 at one freeway segment operating at LOS D, E, or F. The northbound lanes of I-405 between El Segundo Boulevard and I-105 interchange operate at LOS D during the evening peak hour and the proposed project could increase traffic by about 0.022 during the construction phase. Therefore, construction worker traffic for the proposed project could result in significant adverse impacts on freeways in the vicinity of the Refinery.

TABLE 4-18

Proposed Project Impact on Surrounding Freeways (Summer)

No.	Freeway Segment	Dir.	Peak Hour	Freeway Capacity[a]	Existing Conditions		Existing + Project Conditions				
					D/C Ratio	LOS	Project Traffic	Peak Hour Volume	D/C Ratio	LOS	Project Impact
1	I-105 between Sepulveda Blvd. and Douglas St.	EB	AM	8,000	0.443	B	0	3,540	0.443	B	0.000
		EB	PM	8,000	0.425	B	219	3,619	0.452	B	0.027
		WB	AM	8,000	0.420	B	0	3,360	0.420	B	0.000
		WB	PM	8,000	0.510	B	0	4,080	0.510	B	0.000
2	I-105 between Douglas St. and I-405 interchange	EB	AM	8,000	0.631	C	0	5,050	0.631	C	0.000
		EB	PM	8,000	0.610	C	219	5,099	0.637	C	0.027
		WB	AM	8,000	0.599	C	0	4,790	0.599	C	0.000
		WB	PM	8,000	0.729	C	0	5,830	0.729	C	0.000
3	I-405 between Rosecrans Av. And El Segundo Blvd.	NB	AM	9,600	1.090	F(0)	0	10,460	1.090	F(0)	0.000
		NB	PM	9,600	1.051	F(0)	98	10,188	1.061	F(0)	0.010
		SB	AM	9,600	1.033	F(0)	0	9,920	1.033	F(0)	0.000
		SB	PM	9,600	1.258	F(1)	158	12,238	1.275	F(1)	0.016
4	I-405 between El Segundo Blvd. and I-105 interchange	NB	AM	9,600	0.854	D	0	8,200	0.854	D	0.000
		NB	PM	9,600	0.824	D	214	8,124	0.846	D	0.022*
		SB	AM	9,600	0.810	D	0	7,780	0.810	D	0.000
		SB	PM	9,600	0.986	E	65	9,535	0.993	E	0.007

*Potentially significant traffic impact

D/C Ratio	LOS	D/C Ratio	LOS
.00 - .35	A	1.01 – 1.25	F(0)
.36 - .54	B	1.26 - .1.35	F(1)
.55 - .77	C	1.36 – 1.45	F(2)
.78 - .93	D	Above 1.45	F(3)
.94 – 1.00	E		

LOS F(1) through F(3) represent severe congestion (travel speeds less than 25 mph for more than one hour).

[a] Includes HOV lane
[b] D/C Ratio = Demand to Capacity Ratio
Source: See Appendix B for details on the traffic analysis.

Based on the above traffic analysis, the construction phase of the proposed project could result in potentially significant traffic impacts at one intersection (Aviation Boulevard and El Segundo Boulevard) during both the Winter and Summer Scenarios. In addition, traffic impacts are also potentially significant for the southbound lanes of the I-405

between Rosecrans Avenue and El Segundo Boulevard and the northbound lanes of I-405 between El Segundo Boulevard and I-105 interchange. Therefore, the proposed project may result in significant adverse traffic impacts during the construction phase.

4.8.2.2 Operational Impacts

The proposed project is expected to require an additional 12 permanent workers at the Refinery, generating an additional 24 trips per day. In addition to workers, the proposed project is expected to alter the volume of truck traffic at the Refinery. The proposed project will result in increased use of sulfuric acid, catalyst, cooling tower chemicals, amine solution, etc., which will require an increase of one to two truck trips per month. The proposed project is also expected to result in an increase in LPG and sulfur transported by truck from the Refinery of about one per day and two per day, respectively (about 90 truck trips per month). However, the proposed project is expected to reduce the production and sales of aqueous ammonia from the Refinery by about five trucks per day. Therefore, the proposed project is expected to result in a net decrease in truck traffic of about two trucks per day (when accounting for the increased use of other materials). Given that 900 construction worker commute trips per day do not create significant adverse volume to capacity ratio impacts at intersections in the vicinity of the refinery, 12 additional worker commute trips during operation would also not create significant traffic impacts. Similarly, although construction traffic from the proposed project will adversely affect one intersection and two I-405 freeway segments during the winter scenario, an increase of 12 operational worker commute trips is not expected to increase the volume to capacity ratio by 0.02 or more at the Aviation Boulevard/El Segundo Boulevard intersection or the demand-to-capacity ratio by 0.02 or more at the two I-405 segments. Therefore, no significant adverse impacts on traffic are expected due to the operation of the Chevron PRO Project.

4.8.3 MITIGATION MEASURES

Feasible mitigation measures are required to address significant traffic impacts during the construction phase of the proposed project. Because of the temporary nature of the construction traffic, and the inability to change the number of workers needed as well as vehicle emissions, feasible mitigation measures are limited. Chevron is using off-site parking structures and transporting workers to the Refinery during peak construction activities to minimize traffic impacts at intersections adjacent to the Refinery. In addition, the construction work shift is scheduled to begin at 6:30 am so that traffic impacts during the morning peak hour will be avoided. Chevron will encourage ridesharing to reduce single occupancy vehicle trips as well as public transit use. Preferential parking for rideshare vehicles will be provided for construction workers. The traffic analysis assumes that no ridesharing will occur, i.e., average vehicle ridership (AVR) equals 1.0, and, therefore, provides a worst-case estimate of project impacts. However, ridesharing during construction activities is common and will help decrease traffic impacts. The AVR in the Basin is approximately 1.34. The amount of ridesharing that will occur cannot be predicted so traffic impacts are assumed to remain significant.

As part of the proposed project, Chevron will specify in construction contracts for the proposed project that construction workers comply with requirements to use specific travel routes. Construction workers that park in the Pacific Towers and Grand Avenue Courtyard parking structures will be requested to access the structures via the 105 Freeway to Sepulveda Boulevard. In addition, construction workers that access Dockweiler beach will be required to use the 105 Freeway to Vista Del Mar. Both of these requirements will avoid the more congested intersections in the area of the Refinery. Chevron has implemented other measures such as: (1) posting signs in parking lot reminding workers of the travel route requirement; (2) reminding workers with fliers and through announcements by shuttle bus drivers; and (3) occasional visual audits for worker compliance. No other feasible mitigation measures have been identified.

4.8.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The proposed project includes measures that are expected to reduce traffic impacts during the construction phase and no further feasible mitigation measures were identified. However, construction traffic impacts are expected to remain significant. The construction traffic impacts will cease following completion of the construction phase. The traffic impacts associated with the operational phase of the proposed project are expected to be less than significant.

4.9 GROWTH INDUCING IMPACTS

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 12 additional Refinery workers, which can also be drawn from the existing workforce in southern California.

The proposed Refinery modifications are associated with enhancing safety or optimizing the operation of the existing Refinery. The proposed project will not cause an increase in crude throughput and is not expected to result in growth-inducing impacts.

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

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 TACs 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 connecting PRDs to vapor recovery are also expected to reduce potential criteria and TAC emissions. Following completion of the construction phase, the proposed project is not expected to result in significant air quality impacts. Therefore, the proposed project is not expected to have long-term adverse environmental impacts on air quality.

Traffic levels are expected to increase during construction and generate potentially significant adverse traffic impacts. Feasible mitigation measures are expected to reduce traffic impacts but not to a level of less than significant. Operational traffic levels are expected to remain essentially the same as existing levels. Therefore, no significant adverse impacts for 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 1911. Therefore, there is no major commitment of nonrenewable resources or changes that would commit future generations to specific uses of the environment associated with the Chevron PRO Project.

4.11 ENVIRONMENTAL EFFECTS NOT FOUND TO BE SIGNIFICANT

The environmental effects of the Chevron El Segundo Refinery PRO 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:

Air Quality during project operation
Energy
Hazards and Hazardous Materials
Hydrology and Water Quality
Noise
Solid and Hazardous Waste
Transportation/Traffic during project operation

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
Geology/Soils
Land Use/Planning
Mineral Resources
Population/Housing
Public Services
Recreation

Potentially significant adverse impacts were identified for air quality and transportation/traffic associated with construction activities (only).

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