

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Addendum to the Final Environmental Impact Report for the

Chevron Products Company El Segundo Refinery Product Reliability and Optimization Project

SCH. No. 2007081057

[Final EIR Certified May 9, 2008]

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1.0 INTRODUCTION

Chevron Products Company (Chevron) is proposing modifications to its El Segundo Refinery Product Reliability and Optimization (PRO) Project. Specifically, Chevron is proposing several changes to the No. 2 Crude Unit Pressure Relief Devices (PRD) component of the 2008 PRO Project (No. 2 Crude Unit PRD project component) that were made during the permitting process. Because the currently proposed project entails modification of a previously approved project, additional analysis pursuant to the California Environmental Quality Act (CEQA) is warranted. As discussed in this Addendum, it was determined that the previously proposed PRO Project and related environmental impacts were comprehensively evaluated in a previously certified CEQA document. This Addendum evaluates environmental impacts resulting from currently proposed modifications to the PRO Project.

The PRO Project was evaluated in the May 2008 Final Environmental Impact Report (EIR) (SCH No. 2007081057). The project evaluated in the 2008 Final EIR included modifications to the No. 2 Crude Unit, No. 2 Residuum Stripper Unit (RSU), Minalk/Merox Unit, Waste Gas Compressors, Fluidized Catalytic Cracking Unit (FCCU), Alkylation Unit, Vacuum Residuum Desulfurization Unit (VRDS), ISOMAX Unit, Cogeneration (Cogen) Facilities, and the Railcar Loading/Unloading Rack. New process units included sulfur processing facilities (i.e., Sour Water Stripper (SWS), Sulfur Recovery Unit (SRU), Tail Gas Unit (TGU)), Vapor Recovery and Safety Flare System, Water Treatment Facilities (i.e., reverse osmosis units and nitrogen removal units), and additional storage capacity. The purpose of these modifications and additions was to increase the reliability, energy efficiency, and capacity of specific existing Refinery processing equipment; allow the processing of a wider range of crude oils; and voluntarily reduce potential atmospheric emissions from existing pressure relief devices (PRDs). The PRO Project did not result in an increase in crude throughput capacity. The 2008 Final EIR determined the proposed Project would have significant impacts (see Section 2.0) and imposed feasible mitigation measures. In May 2010, an Addendum to the 2008 PRO Project EIR was prepared that addressed modifications to the storage capacity originally proposed in the PRO Project and the addition of a wet gas scrubber to the TGU that was necessary to meet permitting requirements.

The No. 2 Crude Unit PRD project component was delayed from implementation and has been modified based on detailed design engineering. As discussed below, the impacts associated with the detailed design engineering current modifications have been addressed in the previous CEQA document prepared for the PRO Project. The details of the currently proposed modifications are explained in Section 5.2 of this Addendum.

The SCAQMD has evaluated the changes to the May 2008 project (as detailed in Section 5.2 of this Addendum) and determined that the currently proposed modifications do not create any new significant adverse environmental impacts or make substantially worse any existing significant adverse environmental impacts, and only minor additions or changes are necessary to make the May 2008 Final EIR adequate for the revised project. Therefore, when considering the effects of the currently proposed modifications, the SCAQMD has concluded that an Addendum is the appropriate document to be prepared in accordance with CEQA in order to evaluate potential environmental impacts associated with the currently proposed modifications.

2.0 BASIS FOR DECISION TO PREPARE AN ADDENDUM

The SCAQMD was the lead agency responsible for preparing the May 2008 Final EIR and is the public agency that has the primary responsibility for approving the currently proposed modifications. Therefore, the SCAQMD is the appropriate lead agency to evaluate the potential environmental effects of the currently proposed modifications that are the subject of this Addendum.

Based on the analysis of the currently proposed modifications in Sections 6.0 and 7.0, the SCAQMD concludes that the only environmental area possibly adversely affected by the currently proposed modifications is air quality. The May 2008 Final EIR identified significant adverse air quality impacts and transportation and traffic impacts during construction. Impacts to energy, hazard and hazardous materials, hydrology and water quality, noise, and transportation and traffic during operation were analyzed and concluded to be less than significant. As indicated in Section 6.0, the currently proposed modifications do not change these conclusions: significant adverse air quality impacts during construction and operations and transportation and traffic impacts during construction of the PRO Project would still occur under the currently proposed modifications to the project, since the peak construction period has already occurred. However, as shown in Subsection 6.2.1 of this Addendum, the currently proposed modifications will not cause new significant adverse air quality impacts or increase the severity of significant adverse air quality impacts, or result in new significant adverse air quality impacts beyond those previously identified in the May 2008 Final EIR.

Under the currently proposed modifications, air quality impacts during construction would be less than peak daily emissions and traffic impacts would be less because construction activities associated with the No. 2 Crude Unit PRD project component did not occur concurrently with the other PRO Project components. As a result, the currently proposed construction schedule will result in fewer or less significant construction impacts.

Based on the analysis of potential environmental impacts from the currently proposed modifications (Section 6.0), it can be concluded that the currently proposed modifications do not create new significant adverse impacts or increase the severity of significant impacts previously identified in the May 2008 Final EIR. As a result, pursuant to CEQA Guidelines §15164(a), this document constitutes an Addendum to the May 2008 Final EIR for the Chevron Products Company El Segundo Refinery PRO Project. Section 6.0 of this Addendum further explains the basis for the determination to prepare an Addendum.

CEQA Guidelines §15164(a) allows a lead agency to prepare an Addendum to a Final EIR if all of the following conditions are met.

- Substantial changes with respect to the circumstances under which the project is undertaken do not require major revisions to the previous Final EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

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- No new information becomes available which shows new significant effects or significant effects substantially more severe than previously discussed.
- If there are mitigation measures which are different from those analyzed in the previous EIR that would substantially reduce one or more significant effects on the environment, the project proponent agrees to adopt them.
- Only minor technical changes or additions are necessary to make the Final EIR under consideration adequate under CEQA.
- The changes to the Final EIR made by the Addendum do not raise important new issues about the significant effects on the environment.

The currently proposed modifications will result in no new significant adverse effects or substantially increased severity of significant effects previously identified in the May 2008 Final EIR. Further, the currently proposed modifications consist of only necessary minor changes to the May 2008 Final EIR that do not raise important new issues about the previously analyzed significant environmental effects. Thus, the currently proposed modifications meet all of the conditions in the CEQA Guidelines §15164(a) for the preparation of an Addendum. Because the currently proposed modifications meet all of the conditions for preparing an Addendum, a subsequent EIR pursuant to CEQA Guidelines §15162 is not required. This conclusion is supported by substantial evidence as explained in Sections 6.0 and 7.0 of this Addendum.

3.0 BACKGROUND CEQA DOCUMENTS

The activities associated with the Chevron PRO Project were evaluated sequentially in the following CEQA documents. Summaries of the CEQA documents are provided below. The CEQA documents can be obtained by contacting the SCAQMD's Public Information Center at (909) 396-2039 or they can be downloaded from the SCAQMD's CEQA Webpage at the following Internet address:

2008 EIR: <http://www.aqmd.gov/ceqa/documents/2008/nonaqmd/chevron/PRO/chevronFND.html>
2010 Addendum: <http://www.aqmd.gov/ceqa/documents/2010/nonaqmd/chevronAddendum.pdf>

Notice of Preparation of an Environmental Impact Report (EIR) (SCAQMD, August 2007): A Notice of Preparation (NOP) and Initial Study for the Chevron Products Company El Segundo Refinery Product Reliability and Optimization Project were released for a 30-day public review and comment period on August 10, 2007. The Initial Study included a project description, project location, an environmental checklist, and a preliminary discussion of potential adverse environmental impacts. The NOP requested public agencies and other interested parties to comment on the scope and content of the environmental information to be evaluated in the Draft EIR.

Draft EIR (SCAQMD, 2008a): The Draft EIR was released for a 45-day public review and comment period on March 7, 2008. The Draft EIR included a comprehensive project description, a description of the existing environmental setting, a preliminary analysis of potential adverse

environmental impacts for each environmental topic (including cumulative impacts) that could be adversely affected by the proposed project, and mitigation measures, project alternatives, and all other relevant topics required by CEQA. The Draft EIR also included a copy of the NOP and Initial Study, copies of the five comment letters received on the NOP and Initial Study, and responses to all comment letters received on the NOP and Initial Study. It was concluded in the Draft EIR that the Chevron Products Company El Segundo Refinery PRO Project may have significant adverse impacts on air quality and traffic during construction in spite of implementing mitigation measures and less than significant noise and hazard impacts.

Final EIR (SCAQMD, 2008b): The Final EIR was prepared by revising the Draft EIR to incorporate applicable updated project information and to respond to comments received on the Draft EIR. The Final EIR contained four comment letters and responses to comments received on the Draft EIR. The changes included in the Final EIR did not constitute significant new information relating to the environmental analysis or mitigation measures. The Final EIR was certified on May 9, 2008. The May 2008 Final EIR Chapter 1 – Introduction and Executive Summary is presented in Appendix A of this Addendum.

Addendum (SCAQMD, 2010): The 2010 Addendum to the 2008 PRO Project EIR was prepared that addressed modifications to the storage capacity originally proposed in the PRO Project and the addition of a wet gas scrubber to the TGU to meet permitting requirements. The changes did not constitute significant new information under CEQA Guidelines §15164(a) so an Addendum was the appropriate CEQA document. The 2010 Addendum was certified May 13, 2010.

4.0 PROJECT LOCATION

The proposed modifications will occur within the confines of the Chevron El Segundo Refinery. The Refinery is located within the overall southern California region, as shown in Figure 1. The Refinery is located at 324 West El Segundo Boulevard, El Segundo, California, as shown in Figure 2.

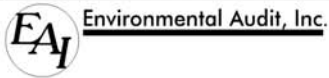
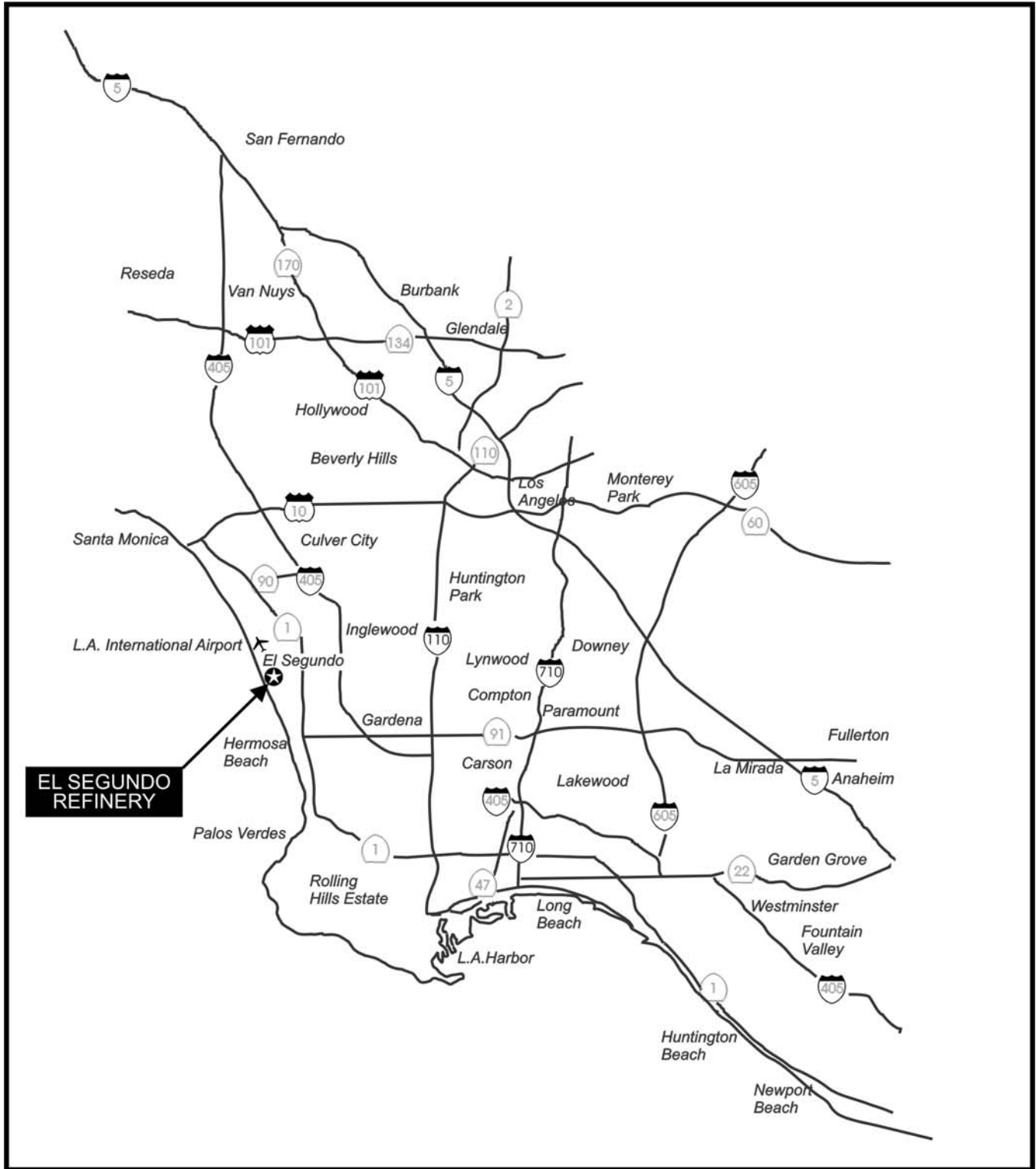
5.0 PROJECT DESCRIPTION

This section presents a description No. 2 Crude Unit PRD project component of the PRO Project as evaluated in the May 2008 Final EIR, as well as a description of the proposed modifications.

5.1 No. 2 Crude Unit PRD Project Component of the May 2008 Final PRO Project EIR

As part of the PRO Project analyzed in the May 2008 Final EIR, the No. 2 Crude Unit PRD project component included routing PRDs that currently vent to the atmosphere from the No. 2 Crude Unit, the No. 2 Residuum Unit, the Minalk/Merox Unit, and rerouting the Waste Gas Compressor Station to a proposed new Vapor Recovery and Safety Flare System. In addition, two knock-out drums were proposed to collect any liquids released from the PRDs for recovery purposes. Construction of the No. 2 Crude Unit PRD project component was originally proposed to take place concurrently with the entire PRO Project.

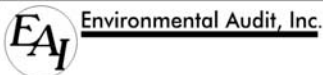
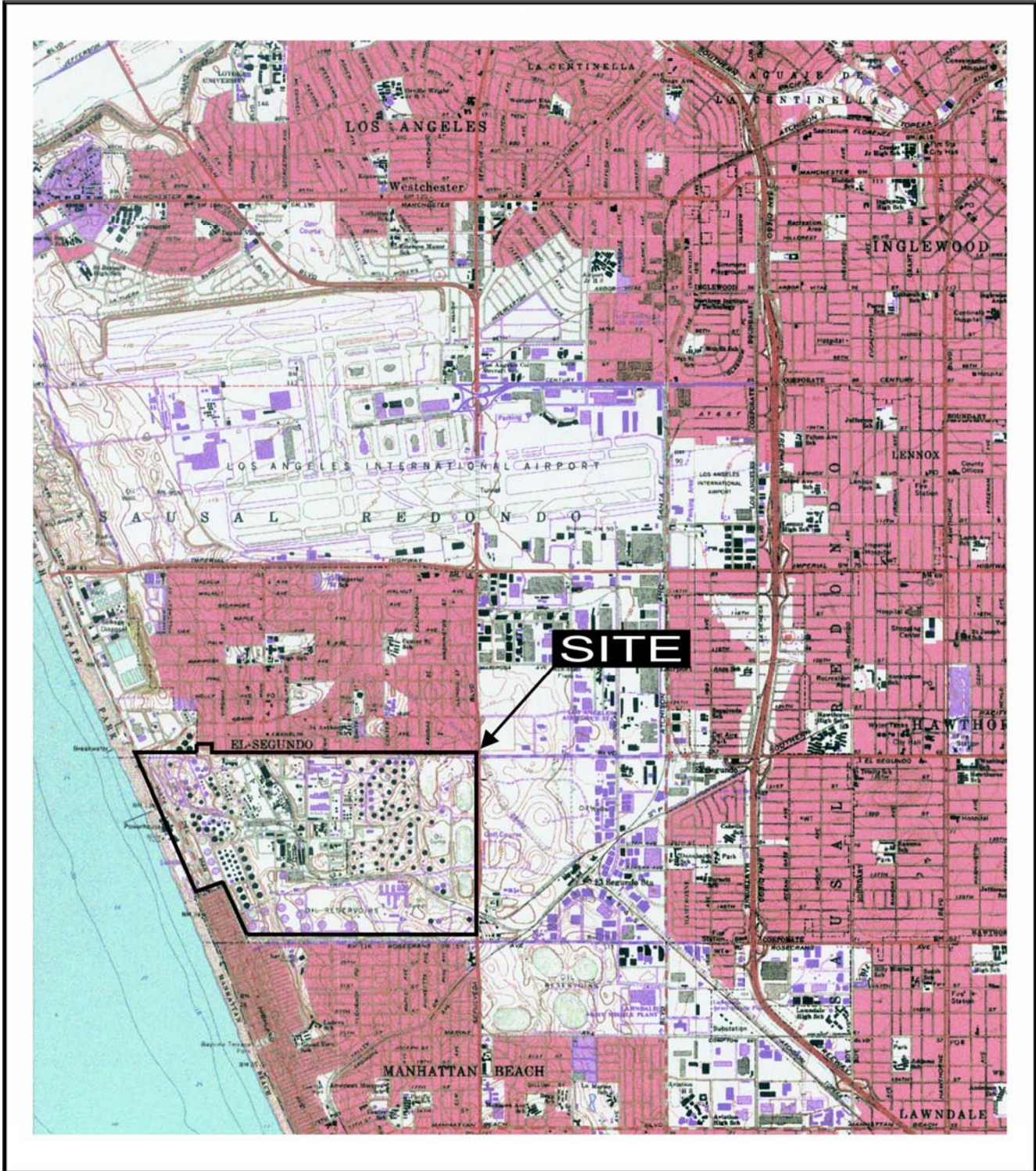
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REGIONAL MAP
Chevron Products Company
El Segundo Refinery



ADDENDUM TO THE FINAL EIR FOR THE CHEVRON PRODUCTS COMPANY EL SEGUNDO REFINERY PRODUCT RELIABILITY AND OPTIMIZATION PROJECT



SITE LOCATION MAP
Chevron Products Company
El Segundo Refinery

5.2 Currently Proposed Modifications

Implementation of the No. 2 Crude Unit PRD project component was delayed and, after further engineering evaluation and design, it has been determined that the existing Low Sulfur Fuel Oil (LSFO) safety flare has the necessary capacity to accommodate emergency releases associated with the PRDs from the No. 2 Crude Unit PRD project component. Therefore, the vapor recovery components that were to be routed to the new Vapor Recovery and Safety Flare System proposed in the May 2008 Final EIR for the PRO Project will be routed to the LSFO safety flare and the new safety flare is no longer necessary.

Additionally, the currently proposed modifications would include installing only one of the two previously proposed knock-out drums and replacing one pressure relief drum in the No. 2 Naphtha Hydrotreater Unit. Therefore, the waste gas compressors in the No. 2 Crude Unit that were proposed to be rerouted to the new Vapor Recovery and Safety Flare System will continue to be routed to the LSFO safety flare. The currently proposed modifications are all PRDs, which are considered to be fugitive emission sources.

A comparison of the No. 2 Crude Unit PRD project component as presented in the May 2008 Final EIR with the currently proposed modifications is presented in Table 1.

**TABLE 1
Comparison of the No. 2 Crude Unit PRD Project**

Project Component	Originally Evaluated In PRO Project EIR?	Included in Proposed Modified Project?
Route PRDs to Vapor Recovery from the No. 2 Crude Unit, No. 2 Residuum Unit, the Minalk/Merox Unit	Yes (Route to New Safety Flare)	Yes (Route to Existing LSFO Safety Flare)
Reroute No. 2 Crude Unit Waste Gas Compressors to the New Vapor Recovery and Safety Flare System	Yes	No
Install a New Safety Flare	Yes	No
Install two Knock-out Drums in No. 2 Crude Unit	Yes	Yes (Only One Drum)
Replace one Pressure Relief Drum in the Naphtha Hydrotreater Unit (NHT-2)	No	Yes

6.0 IMPACT ANALYSIS

The following sections present a description of the impact analysis contained in the May 2008 Final EIR associated with the No. 2 Crude Unit project component, as well as the analysis of the impacts of the currently proposed modifications.

This section sequentially presents the initial project evaluated in the May 2008 Final EIR and the currently proposed modifications to show the chronology of the impact analysis, and to show the comparison of the currently proposed modifications with the May 2008 Final EIR Project.

6.1 Summary of Air Quality Impacts in the May 2008 Final EIR

6.1.1 Construction Emissions

The peak day construction emissions analyzed in the May 2008 Final EIR for the PRO Project for all components of the PRO Project are shown in Table 2.

TABLE 2
Peak Construction Emissions for the PRO Project
as Presented in the May 2008 Final EIR⁽¹⁾
(lbs/day)

ACTIVITY	CO	VOC	NO_x	SO_x	PM10	PM2.5
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	--	--	--	--	128.25	74.39
Fugitive Road Dust	--	--	--	--	15.63	9.07
Total Construction Emissions	708.99	152.45	754.27	1.04	177.01	102.36

(1) From Table 4-3 of the May 2008 Final PRO Project EIR.

6.1.2 Operational Emissions

The emissions included in the May 2008 Final EIR for the PRO Project associated with the operation of the No. 2 Crude Unit PRD project component only are shown in Table 3.

TABLE 3
Operational Emissions Associated with the No. 2 Crude Unit PRD Project Component
as Presented in the May 2008 Final EIR⁽¹⁾
(lbs/day)

Sources	CO	VOC	NO_x	SO_x	PM₁₀	PM_{2.5}
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	--	--	--	--
NEW UNITS						
Vapor Recovery and Safety Flare System	2.3	3.2	8.4	0.1	0.5	0.5
TOTAL EMISSIONS	2.3	21.0	8.4	0.1	0.5	0.5

(1) From Table 4-5 of the May 2008 Final PRO Project EIR.

6.2 Analysis of Impacts from the Currently Proposed Modifications

This Addendum includes an evaluation of all 17 of the environmental topics identified in the environmental checklist (CEQA Guidelines, Appendix G) and concluded that one environmental topic evaluated in the May 2008 Final EIR would potentially be adversely affected by the currently proposed modifications - air quality. The following subsection present the results of the evaluation of the air quality impacts associated with the currently proposed modifications. Section 7.0 presents the analysis of the remaining 16 environmental topic areas where the impacts of the currently proposed modifications were evaluated in the Addendum and found not to be potentially significant.

6.2.1 Air Quality

Both construction and operational air quality impacts were evaluated in the May 2008 Final EIR. Air quality impacts that equal or exceed the significance thresholds identified in Table 4 are considered to be potentially significant adverse air quality impacts.

Construction Emissions

Implementation of the No. 2 Crude Unit PRD project component has been delayed and less construction is required to complete the currently proposed modified No. 2 Crude Unit PRD project component, since no new safety flare would be installed. Construction emissions associated with the currently proposed modified Project are shown in Table 5 and compared to the peak construction emissions analyzed in the May 2008 Final EIR. As the No. 2 Crude Unit project component is no longer occurring concurrently with the remainder of the PRO Project and no other aspects of the PRO Project are currently under construction, no overlap in construction emissions will occur. As shown in Table 5, the emissions associated with the No. 2 Crude Unit project component are less than the peak day construction emissions analyzed in the May 2008 Final EIR.

**TABLE 4
Air Quality Significance Thresholds**

Mass Daily Thresholds^(a)		
Pollutant	Construction^(b)	Operation^(c)
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
SO_x	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants, Odor, and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Chronic and Acute Hazard Index ≥ 1.0 (project increment) Cancer Burden ≥ 0.5 excess cancer cases (in areas ≥ 1 in 1 million)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000MT/yr CO ₂ eq for industrial facilities	
Ambient Air Quality for Criteria Pollutants^(d)		
NO₂ 1-hour average annual average	In attainment; significant if project causes or contributes to an exceedance of any standard: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM10 24-hour annual average	10.4 $\mu\text{g}/\text{m}^3$ (construction) ^(e) and 2.5 $\mu\text{g}/\text{m}^3$ (operation) 1.0 $\mu\text{g}/\text{m}^3$	
PM2.5 24-hour average	10.4 $\mu\text{g}/\text{m}^3$ (construction) ^(e) and 2.5 $\mu\text{g}/\text{m}^3$ (operation)	
SO₂ 1-hour average 24-hour average	0.255 ppm (state) and 0.075 ppm (federal – 99 th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	25 $\mu\text{g}/\text{m}^3$ (state)	
CO 1-hour average 8-hour average	In attainment; significant if project causes or contributes to an exceedance of any standard: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day average Rolling 3-month average Quarterly average	1.5 $\mu\text{g}/\text{m}^3$ (state) 0.15 $\mu\text{g}/\text{m}^3$ (federal) 1.5 $\mu\text{g}/\text{m}^3$ (federal)	

a) Source: SCAQMD Air Quality Significance Thresholds, www.aqmd.gov/ceqa/handbook/signthres.pdf.

b) Construction thresholds apply to both the SCAB and Coachella Valley (Salton Sea and Mojave Desert Air Basin)

c) For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.

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

e) Ambient air quality threshold based on SCAQMD Rule 403.

KEY: ppm = parts per million; $\mu\text{g}/\text{m}^3$ = microgram per cubic meter; lbs/day = pounds per day; MT/yr CO₂eq = metric tons per year of CO₂ equivalents, \geq greater than or equal to, $>$ greater than

Therefore, the original construction emission analysis in the May 2008 Final EIR was conservative, encompasses the proposed modified No. 2 Crude Unit project component, and does not require additional analysis under CEQA.

**TABLE 5
Peak Construction Emissions
for the Proposed Modified No. 2 Crude Unit Project Component
(lbs/day)**

ACTIVITY	CO	VOC	NO_x	SO_x	PM10	PM2.5
Construction Equipment	61.00	15.62	75.12	0.10	1.90	1.75
Vehicle Emissions	4.81	0.51	0.48	0.01	0.32	0.11
Fugitive Dust From Construction	--	--	--	--	7.27	4.22
Currently Proposed Modified Project Total Peak Daily Construction Emissions⁽¹⁾	65.80	16.31	75.60	0.11	9.50	6.07
Total Peak Daily Construction Emissions from the 2008 Final EIR	708.99	152.45	754.27	1.04	177.01	102.36
Difference in Peak Daily Emissions	-643.19	-136.14	-678.67	-0.93	-167.51	-96.29

(1) Sum of emissions may differ from total emissions due to rounding.

Localized construction impacts were analyzed in the May 2008 Final EIR and were concluded to be less than significant. Since the peak daily construction activities associated with the modified No. 2 Crude Unit PRD project component are expected to be less than the peak daily previously analyzed, the analysis previously presented conservatively represents the impacts of the proposed modified No. 2 Crude Unit PRD project component and, therefore, are considered to be less than significant.

Operational Emissions

The emissions estimated for the No. 2 Crude Unit PRD project component presented in the May 2008 Final EIR were based on preliminary engineering estimates and conservatively estimated the equipment necessary to connect the PRDs to the new safety flare. The final engineering evaluation of the No. 2 Crude Unit PRD project component more accurately identifies the necessary valves, flanges, and other equipment. Additionally, elimination of the new safety flare reduces the emissions from fugitive components and the flare pilots. The revised emissions for the No. 2 Crude Unit project component are shown in Table 6. A comparison of the proposed modified No. 2 Crude Unit project component emissions to the No. 2 Crude Unit project component analyzed in the May 2008 Final EIR emissions is also presented in Table 6. As shown in Table 6, the proposed modified No. 2 Crude Unit project component would generate lower emissions compared to the No. 2 Crude Unit PRD project component analyzed in the May 2008 Final EIR. Therefore, the analysis in the May 2008 Final PRO Project EIR was conservative, encompasses the proposed modified No. 2 Crude Unit project component, and does not require additional analysis under CEQA.

**TABLE 6
Operational Emissions Associated with the
Proposed Modified No. 2 Crude Unit PRD Project Component
(lbs/day)**

Sources	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
STATIONARY SOURCES:						
MODIFICATIONS						
No. 2 Crude Unit PRDs	--	5.75	--	--	--	--
No. 2 Residuum Stripper Unit PRDs	--	0.58	--	--	--	--
Minalk/Merox Unit PRDs	--	0.61	--	--	--	--
NHT-2 Pressure Relief Drum	--	2.99	--	--	--	--
Vapor Recovery System to LSFO Flare		0.79				
Waste Gas Compressors	--	0.45	--	--	--	--
Currently Proposed Modified Project Total Peak Daily Emissions	0	11.17	0	0	0	0
Total Peak Daily Emissions from the 2008 Final EIR	2.3	21.0	8.4	0.1	0.5	0.5
Change in Peak Daily Emissions	-2.3	-9.83	-8.4	-0.1	-0.5	-0.5

Impacts to Ambient Air Quality

The impacts to ambient air quality as presented in the May 2008 Final EIR were evaluated for only the new combustion sources (i.e., flare, Cogen Train D, TGU, and cooling tower) from the PRO Project (see May 2008 Final EIR, Appendix C, Ambient Air Quality Report, pages C-41 et. seq.). The proposed modified No. 2 Crude Unit PRD project component would eliminate the new safety flare. The analysis and conclusions presented in the May 2008 Final EIR, concluded the PRO Project impacts would be less than the applicable ambient air quality standards and overestimated the impacts of the PRO Project when including the modified No. 2 Crude Unit PRD project component. Therefore, the PRO Project including the modified No. 2 Crude Unit PRD project component would be considered to have less than significant impacts to ambient air quality and would not change the conclusions made in the May 2008 Final EIR.

Toxic Air Contaminants

As part of the May 2008 Final EIR, a health risk assessment (HRA) was prepared for the PRO Project to determine if emissions of toxic air contaminants (TAC) generated by the PRO Project would exceed the SCAQMD thresholds of significance for cancer risk. The results of the HRA indicated that the cancer risk and non-cancer risk did not exceed the applicable significance thresholds and were considered less than significant. The proposed No. 2 Crude Unit PRD project component reduces emissions of VOCs and the TAC contained in the VOCs. Therefore, the May 2008 Final EIR HRA overestimates the cancer and non-cancer risk associated with the PRO Project when including the modified No. 2 Crude Unit PRD project component. Therefore, the PRO Project including the modified No. 2 Crude Unit PRD project component would be considered to have less than significant impacts associated from TAC emissions and would not change the conclusions made in the May 2008 Final EIR.

Cumulative Air Quality Impacts

Construction Impacts: In the May 2008 Final EIR, it was concluded that the cumulative air quality impacts associated with the construction phase of the PRO Project and other related projects would exceed the CEQA significance thresholds for CO, VOC, NO_x, PM₁₀, and PM_{2.5}. Therefore, the cumulative air quality construction impacts were considered significant.

The peak daily construction emissions for the proposed modified No. 2 Crude Unit PRD project component, as shown in Table 5, would not exceed the construction emission significance thresholds shown in Table 4. The El Segundo Power Plant cumulative project is the largest source of construction emissions (i.e., significant for CO, VOC, NO_x, SO_x, and PM₁₀ as a stand-alone project) and is not anticipated to be complete until the fourth quarter of 2013. Therefore, the "worst-case" cumulative impact analysis for the proposed No. 2 Crude Unit PRD project component would still include the emissions from construction of the El Segundo Power Plant project occurring concurrently with the proposed modifications. Therefore, the cumulative air quality impacts are expected to remain significant.

Operational Impacts: In the May 2008 Final EIR, it was concluded that the cumulative air quality impacts associated with the operational phase of the PRO Project and other cumulative projects would exceed the CEQA significance thresholds for CO, VOC, NO_x, SO_x, PM₁₀, and PM_{2.5}.

The peak daily incremental change in operational emissions for the proposed modified No. 2 Crude Unit PRD project component are emissions reductions, as shown in Table 6, and are less than the significance thresholds shown in Table 3 for all pollutants. Therefore, the currently proposed modifications will not make a cumulatively considerable contribution to impacts related to CO, VOC, NO_x, SO_x, PM₁₀, or PM_{2.5} because the emissions from the proposed modifications will be less than the SCAQMD CEQA significance thresholds and does not change the significance determination made in the May 2008 Final EIR. Per CEQA Guidelines §15064(h)(4), the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable. Therefore, air quality impacts associated with the operation of the currently proposed modifications are not cumulatively considerable.

Toxic Air Contaminants: The May 2008 Final EIR concluded that the cumulative impacts associated with the PRO Project were below the significance criteria for cancer risk of ten per one million and below the significance criteria for hazard indices of 1.0. Therefore, significant adverse cumulative impacts were not expected from the PRO Project.

The proposed modified No. 2 Crude Unit PRD project component would reduce emissions of TAC and the associated health risk. Therefore, the currently proposed modifications will not make a cumulatively considerable contribution to TAC impacts because the emissions from the proposed modifications will be less than the SCAQMD CEQA significance thresholds. Per CEQA Guidelines §15064(h)(4), the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable. Therefore, health risks due to exposure to TAC emissions

associated with the operation of the proposed modified No. 2 Crude Unit PRD project component are not cumulatively considerable.

Greenhouse Gas Emissions

The May 2008 Final EIR included an impact evaluation of greenhouse gas (GHG) emissions. The operational phase of the PRO Project including the 2010 Addendum modifications was expected to generate 196,476 metric tons per year of GHG emissions of which 431 metric tons per year were associated with the new safety flare. The GHG emissions were considered significant and mitigation was imposed. The cumulative impacts of GHG emissions associated with the PRO Project following mitigation were considered to be less than significant.

The proposed modified No. 2 Crude Unit PRD project component eliminates the new safety flare, which reduces the expected GHG emissions by 431 metric tons per year to a revised total of 193,045 metric tons per year. The proposed modified No. 2 Crude Unit PRD project component would not create an emissions increase in excess of the SCAQMD GHG significance threshold of 10,000 metric tons per year. Therefore, the proposed modifications are considered less than significant. The PRO Project GHG emissions are expected to remain less than significant after mitigation because implementation of the mitigation measure has not changed. Therefore, the proposed modified No. 2 Crude Unit PRD project component would not change the conclusions or mitigation from the 2008 Final EIR and the PRO Project GHG emissions would remain less than significant following mitigation.

Mitigation Measures

Nine mitigation measures were required for the construction emissions and one mitigation measure for operational GHG emissions in the May 2008 Final EIR as they exceeded the SCAQMD CEQA significance thresholds for NO_x and for GHG emissions. The May 2008 Final EIR construction mitigation measures:

- require development and implementation of a construction management plan,
- minimize the use of diesel-powered equipment through the use of electric or alternative-fueled equipment where available,
- limit truck idling,
- require equipment maintenance,
- require diesel particulate filters on cranes greater than 200 horsepower,
- require development and implementation of a fugitive dust emissions management plan, and
- prohibit the use of air pollutant emitting construction equipment on days with a first stage smog alert.

The mitigation measures included in the May 2008 Final EIR will be implemented for the proposed modified No. 2 Crude Unit project component. The changes to construction and GHG emissions are less than significant, so no additional mitigation is necessary.

6.2.2 Other Topics Analyzed in the 2008 Final EIR

Six other environmental topics – energy, hazards/hazardous materials, hydrology/water quality, noise, solid/hazardous waste, and transportation/traffic were analyzed in detail in the May 2008 Final EIR. Table 7 presents the summary of those environmental topics including impacts, mitigation measures, and residual impacts as presented in the May 2008 Final EIR. The proposed modified No. 2 Crude Unit PRD project component does not affect the analysis for these topics with the exception of transportation/traffic. The conclusions related to transportation/traffic were based on the use of satellite parking due to the lack of adequate on-site parking. With the delay of implementing the No. 2 Crude Unit PRD project component, adequate on-site parking is available. Therefore, no satellite parking and shuttling of workers to the Refinery would be necessary. The residual impact would remain the same (i.e., parking impacts during construction are less than significant). Additionally, the peak daily construction workforce for the PRO Project was expected to be 900 workers. The proposed modified No. 2 Crude Unit PRD project component is expected to require 50 construction workers of a peak day. The transportation/traffic conclusion of significant traffic impacts during peak commute hours is overly conservative for the construction of the modified No. 2 Crude Unit PRD project component, since only 50 workers are needed on a peak day compared to the peak daily of 900 workers. The peak construction period occurred prior to the proposed modifications. Therefore, traffic impacts during peak commute hours would remain significant.

**TABLE 7
Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts for Other
Environmental Topics Analyzed in the May 2008 Final EIR**

IMPACT	MAY 2008 FINAL EIR	PROPOSED NO. 2 CRUDE UNIT MODIFICATIONS
Energy		
No significant energy resource impacts are expected from the construction or operation of the PRO Project, as the project includes Cogen Train D which will provide additional electricity to the Refinery.	Energy resources impacts are less than significant. No mitigation required.	Less natural gas use expected with the elimination of the new safety flare. Energy resources impacts remain less than significant.
Hazards and Hazardous Materials		
None of the new or modified units will create a hazard that could extend further off-site so no significant adverse hazards and hazardous material impacts are expected from the construction or operation of the PRO Project.	Hazards and hazardous material impacts are less than significant. No mitigation required.	Less fugitive components and eliminates the new safety flare. Hazards and hazardous material impacts remain less than significant.
Hydrology and Water Quality		
The increase in water demand associated with the PRO Project will be provided through the use of reclaimed water so no significant adverse impacts on water demand are expected.	Water demand impacts are less than significant. No mitigation required.	No effect on water demand. Water demand impacts remain less than significant.

**TABLE 7 (continued)
Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts for Other Environmental Topics Analyzed in the May 2008 Final EIR**

IMPACT	MAY 2008 FINAL EIR	PROPOSED NO. 2 CRUDE UNIT MODIFICATIONS
Hydrology and Water Quality (continued)		
The increase wastewater generated by the PRO Project is within the capacity of the wastewater treatment plant and the facility's NPDES permit.	Wastewater impacts are less than significant. No mitigation required.	No effect on wastewater generation. Wastewater impacts remain less than significant.
Noise		
Construction noise increases are expected to be less than 1.2 decibels and less than significant.	Construction noise impacts are less than significant. No mitigation required.	Less construction activities. Construction noise impacts remain less than significant.
Operational noise increases are expected to be less than 1.3 decibel so no audible change in noise levels is expected and noise impacts are less than significant.	Operational noise impacts are less than significant. No mitigation required.	No effect on noise sources. Operational noise impacts remain less than significant.
Solid and Hazardous Waste		
No significant adverse solid and hazardous waste impacts are expected from the construction or operational phases of the PRO Project.	Solid and hazardous waste impacts are less than significant. No mitigation required.	No effect on solid and hazardous waste generation. Solid and hazardous waste impacts remain less than significant.
Transportation and Traffic		
The demand for parking facilities due to construction workers will exceed the spaces available at the Refinery.	The PRO Project includes the use of satellite parking lots and transporting workers to the Refinery via bus. Parking impacts during construction are less than significant.	Parking on-site is available. Parking impacts during construction remain less than significant.
During the peak construction period, evening peak traffic at the intersection of Aviation Boulevard/El Segundo Boulevard is expected to change the LOS from E to F, creating a significant traffic impact. The construction work shift is schedule to begin at 6:30 a.m. which will avoid the morning peak traffic period.	Ridesharing of construction will be encouraged but cannot be guaranteed. Construction traffic impacts during the evening peak hour are expected to remain significant.	Construction traffic is less than the peak traffic (50 versus 900). Construction traffic impacts during the evening peak hour occurred prior to the proposed modifications, were significant, and, therefore, remain significant.
During the peak construction period, two freeway segments will be impacted during the evening peak hour, including the southbound lanes of I-405 between Rosecrans Ave. and El Segundo Blvd. and the northbound lanes of I-405 between El Segundo Blvd. and the I-105 interchange.	Ridesharing of construction will be encouraged but cannot be guaranteed. Construction traffic impacts during the evening peak hour are expected to remain significant.	Construction traffic is less than the peak traffic (50 versus 900). Construction traffic impacts during the evening peak hour occurred prior to the proposed modifications, were significant, and, therefore, remain significant.

**TABLE 7 (concluded)
Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts for Other
Environmental Topics Analyzed in the May 2008 Final EIR**

IMPACT	MAY 2008 FINAL EIR	PROPOSED NO. 2 CRUDE UNIT MODIFICATIONS
Transportation and Traffic (continued)		
The proposed project is expected to generate an additional 24 trips per day during the operational phase and a reduction of truck trips of about 2 per day. No significant adverse traffic impacts are expected.	Transportation and traffic impacts associated with operation of the proposed project are less than significant. No mitigation required.	No effect on transportation and traffic. Transportation and traffic impacts associated with operation of the proposed project remain less than significant.

6.2.3 Conclusions

Based on the analysis presented, no new or substantially worse environmental impacts to air quality, energy, hazards/hazardous materials, hydrology/water quality, noise, solid/hazardous waste, or transportation/traffic are expected from the proposed modified No. 2 Crude Unit PRD project component of the PRO Project than what was previously analyzed in the May 2008 Final EIR.

7.0 TOPIC AREAS FOUND NOT TO BE POTENTIALLY SIGNIFICANT

The remaining environmental topic areas found not to be potentially significant in the May 2008 Final EIR, which will not be affected by implementing the proposed modified No. 2 Crude Unit PRD project component are presented in Table 8. The rationale for determining the proposed modified No. 2 Crude Unit PRD project component does not affect the conclusions previously determined are also presented in Table 8.

8.0 CONCLUSIONS

As shown in Sections 6.0 and 7.0, the analysis of the current proposed modifications indicated that no new significant adverse impacts would be created for any environmental areas analyzed in the May 2008 Final EIR or make substantially worse any existing significant adverse impacts. Based on the environmental analysis prepared for the proposed modified No. 2 Crude Unit PRD project component, the SCAQMD has quantitatively and qualitatively demonstrated that the proposed modifications qualify for an Addendum to the previously certified May 2008 Final EIR.

**TABLE 8
Environmental Topics Found not to be Potentially Significant
in the May 2008 Final EIR for the PRO Project and Not Affected by Proposed Modifications**

Environmental Topic	Rationale
Aesthetics	No proposed change affecting the height or lighting of equipment is proposed.
Biological Resources	No proposed change in the location, existence of vegetation, or existence of wetlands is required.
Cultural Resources	All proposed project areas have been previously graded and disturbed.
Geology and Soils	No proposed change to the amount of grading.
Land Use and Planning	No proposed change to zoning or land use.
Mineral Resources	No proposed change affecting mineral resources.
Population and Housing	Less construction workers than previously analyzed and the construction workforce is still expected to be drawn from the existing local labor pool.
Public Services	The proposed modifications are smaller in scope.
Solid and Hazardous Waste	The proposed modifications are smaller in scope.
Recreation	No recreation facilities are involved in the proposed modifications.

9.0 REFERENCES

SCAQMD, 2007. Notice of Preparation/Initial Study, Chevron Products Company El Segundo Refinery, Product Reliability and Optimization Project, August 2007.

SCAQMD, 2008a. Draft Environmental Impact Report, Chevron Products Company El Segundo Refinery, Product Reliability and Optimization Project, March 2008.

SCAQMD, 2008b. Final Environmental Impact Report, Chevron Products Company El Segundo Refinery, Product Reliability and Optimization Project, May 2008.

SCAQMD, 2010. Addendum to the Final Environmental Impact Report, Chevron Products Company El Segundo Refinery, Product Reliability and Optimization Project, May 2010.

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APPENDIX A

MAY 2008 FINAL EIR - CHAPTER 1 - INTRODUCTION AND EXECUTIVE SUMMARY

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CHAPTER 1

INTRODUCTION AND EXECUTIVE SUMMARY

Introduction

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

Chevron Products Company is proposing the Product Reliability and Optimization (PRO) Project at its existing El Segundo Refinery (Refinery). The proposed project includes modifications to the No. 2 Crude Unit, No. 2 Residuum Stripper Unit (RSU), Minalk/Merox Unit, Waste Gas Compressors, Fluidized Catalytic Cracking Unit (FCCU), Alkylation Unit, Vacuum Residuum Desulfurization Unit (VRDS), ISOMAX Unit, Cogeneration (Cogen) Facilities, and the Railcar Loading/Unloading Rack. New process units include sulfur processing facilities (i.e., Sour Water Stripper (SWS), Sulfur Recovery Unit (SRU), and Tail Gas Unit (TGU)), Vapor Recovery and Safety Flare System, Water Treatment Facilities (i.e., reverse osmosis units and nitrogen removal units), and additional storage capacity. The purpose of these modifications and additions is to increase the reliability, energy efficiency, and capacity of specific existing Refinery processing equipment; allow the processing of a wider range of crude oils; and voluntarily reduce potential atmospheric emissions from existing pressure relief devices (PRDs). The proposed project will not increase or decrease the overall refinery crude throughput capabilities.

1.2 PURPOSE/LEGAL REQUIREMENTS

In accordance with §15121(a) of the California Environmental Quality Act (CEQA) Guidelines (California Administrative Code, Title 14, Division 6, Chapter 3), the purpose of an Environmental Impact Report (EIR) is to serve as an informational document that: “will inform public agency decision-makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project.” The proposed project requires discretionary approval from the South Coast Air Quality Management District (SCAQMD) and, therefore, it is subject to the requirements of CEQA (Public Resources Code, §21000 et seq.).

CEQA Public Resources Code §21000 et seq., requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. The lead agency is the public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment (Public Resources Code §21067). The proposed project requires discretionary approval from the SCAQMD for air quality permits for modifications to existing stationary source equipment and installation of new stationary source equipment. Therefore, the SCAQMD has the primary responsibility for supervising or approving the entire project as a whole and is the most appropriate public agency to act as lead agency (CEQA Guidelines §15051(b)).

To fulfill the purpose and intent of CEQA, as the lead agency for this project the SCAQMD prepared and released for a 30-day public review and comment period, a Notice of Preparation and Initial Study (NOP/IS) to identify potentially significant environmental impacts, and providing a preliminary analysis associated with the Chevron Products Company's PRO Project (see Appendix A).

1.3 SCOPE AND CONTENT

The NOP/IS was circulated for a 30-day comment period beginning on August 10, 2007 through September 11, 2007. The NOP/IS was circulated in El Segundo and to neighboring jurisdictions, responsible agencies, other public agencies, and interested individuals in order to solicit input on the scope of the environmental analysis to be included in the EIR. Five comment letters were received on the NOP/IS during the public comment period. Responses to those comments are provided in Appendix A. The NOP/IS formed the basis for and focus of the technical analyses in this ~~Draft~~ *Final* EIR. The following environmental issues were identified in the NOP/IS as potentially significant and are further addressed in this document:

- Air Quality,
- Energy,
- Hazards and Hazardous Materials,
- Hydrology/Water Quality,
- Noise,
- Solid/Hazardous Waste, and
- Transportation/Traffic.

The NOP/IS concluded that the proposed project would not create significant adverse environmental impacts to the following areas: aesthetics, agricultural resources, biological resources, cultural resources, geology and soils, land use and planning, mineral resources, population and housing, public services, and recreation. No comments were received disputing this conclusion.

A discussion of potential cumulative impacts is also provided. The alternatives in Chapter 6 of this ~~Draft~~ *Final* EIR were prepared in accordance with §15126.6 of the CEQA Guidelines. Chapter 6 describes a range of reasonable alternatives that could feasibly attain the basic objectives of the proposed project as a means of eliminating or reducing some of the significant adverse environmental effects associated with the proposed project.

1.4 RESPONSIBLE AND OTHER AGENCIES

CEQA Guidelines §15381 defines a “responsible agency” as: “a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration. For purposes of CEQA, responsible agencies

include all public agencies other than the lead agency that have discretionary approval authority over the project.”

The following agencies may have ministerial permitting authority for aspects of modifications at the Refinery, and have been given an opportunity to review and comment on the NOP/IS and EIR; however, no new discretionary permits or permit modifications are expected to be required from these agencies for the proposed project:

- State Water Resources Control Board (SWRCB),
- Los Angeles Regional Water Quality Control Board (RWQCB), and
- City of El Segundo.

For convenience, all the above agencies will be referred to generally as Responsible Agencies in this EIR. For the record, none of the above agencies submitted a comment letter on the NOP/IS.

No trustee agencies as defined by CEQA Guidelines §15386 have been identified with respect to the proposed project. However, notice of the proposed project has been sent to the Office of Planning and Research pursuant to Public Resources Code §21080.4 for distribution in the event trustee or other responsible agencies are identified for the proposed project.

1.5 INTENDED USES OF THE EIR

The EIR is intended to be a decision-making tool that provides full disclosure of the environmental consequences associated with implementing the proposed project. Additionally, CEQA Guidelines §15124(d)(1) requires a public agency to identify the following specific types of intended uses:

- A list of the agencies that are expected to use the EIR in their decision-making;
- A list of permits and other approvals required to implement the project; and,
- A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

To the extent that local public agencies, such as cities, county planning commissions, etc., are responsible for making land use and planning decisions related to the proposed project, they could possibly rely on this EIR during their decision-making process. See the preceding section for a list of public agencies’ whose approval may be required and who may also be expected to use this EIR in their decision-making process.

1.6 AREAS OF CONTROVERSY

In accordance with CEQA Guidelines §15123(b)(2), the areas of controversy known to the lead agency, including issues raised by agencies and the public, shall be identified in

the CEQA document. After public notification and review of the NOP/IS, the SCAQMD received five comment letters. Issues raised in the comment letters are related specifically to potential impacts from the proposed project and were addressed in the EIR and responses to those comment letters are provided in Appendix A. “Controversy” is defined as a difference in opinion or a dispute. No such issues have been raised regarding the Chevron proposed project. Consequently, there are no areas of controversy known to the lead agency.

1.7 EXECUTIVE SUMMARY – CHAPTER 2: PROJECT DESCRIPTION

1.7.1 INTRODUCTION

Chevron Products Company is proposing a project at the Refinery to increase the reliability, energy efficiency, flexibility and capacity of specific Refinery equipment. The PRO Project includes modifications to existing specific process units, new process units, and also new infrastructure that supports and links these units to other processes, units or facilities throughout the Refinery. The proposed project will involve physical changes and additions to multiple process units and operations as well as operational and functional improvements primarily within the confines of the Refinery.

1.7.2 PROJECT OBJECTIVES

The objectives of the proposed project at the Refinery are to:

1. Improve the energy efficiency, performance, and reliability of process units;
2. Allow the Refinery to efficiently and reliably process a wider range of crude oils, including higher sulfur-containing crude oils;
3. Produce lower sulfur fuel products and increase production of commercial grade elemental sulfur;
4. Improve the management of blending components of California Air Resources Board (CARB) fuels; and,
5. Reduce the potential for atmospheric releases and related emissions from PRDs in the No. 2 Crude Unit, No. 2 Residuum Unit, and the Minalk/Merox Unit.

The proposed project will not increase or decrease the overall Refinery crude throughput capabilities.

1.7.3 PROJECT LOCATION

The proposed project will occur primarily within the confines of the Refinery, except for improvements at the West Basin Municipal Water District (WBMWD), which is located just east and also just north of the Refinery. Additional utility improvements will be required to Southern California Edison (SCE) facilities. The Refinery, which was constructed over 90 years ago, is located at 324 West El Segundo Boulevard in the City of El Segundo, within the southern California region.

1.7.4 LAND USE AND ZONING

The Refinery is bounded by El Segundo Boulevard to the north, Sepulveda Boulevard to the east, Rosecrans Avenue to the south, and Vista Del Mar to the west. The Chevron Refinery is located in an area of mixed land uses, with industrial, recreation, residential, and commercially zoned areas nearby. Land use to the north of the Chevron Refinery is primarily residential, with a mix of commercial and light industrial zoning mixed in. The predominant adjacent land uses west of the Refinery are nearly all heavy industrial, or open space, which includes: Dockweiler State Beach, Manhattan Beach, and the El Segundo Generating Station, although a small parcel of land at the southwest corner of the Chevron property is made up of commercial and multiple-family residential.

Directly south of the Refinery, there is a single-family residential area bordering the entire length of the Refinery separated by Rosecrans Avenue. The corridor immediately east of the Refinery is comprised of a golf course at the corner of Sepulveda Boulevard and El Segundo Boulevard, with light commercial and heavy industrial zoning for the rest of the tract. The Refinery is located in the City of El Segundo within Los Angeles County in an urbanized area that includes a substantial amount of industrial development, due to the proximity of Los Angeles International Airport (LAX).

1.7.5 EXISTING REFINERY CONFIGURATION AND OPERATION

Crude oil, used to produce gasoline and other refinery products, is delivered by ship to the marine terminal and pumped to the Refinery by existing pipelines or received via pipeline directly to the Refinery. The crude oil is then processed in the crude units where it is heated and distilled into multiple feedstock components that are later processed elsewhere in the Refinery. The heavy residual oil leaving the crude units is further distilled in the vacuum units to yield additional, lighter hydrocarbon products and vacuum residuum. The vacuum residuum is processed in the Coker Unit and the lighter hydrocarbon components from the crude units and vacuum units are fed to other Refinery units for further processing. Some of the major downstream processes are cracking in the FCCU and ISOMAX Unit, processing to recover sulfur in the hydrotreating units including the VRDS Unit, synthesizing in the Alkylation Unit, and reforming in the CCR Unit.

Auxiliary systems are also needed to support Refinery operations including hydrogen plants (to produce hydrogen needed for certain refinery reactions), boilers to produce

steam, cogeneration plants to produce electricity and steam, and wastewater treatment systems.

1.7.6. PROPOSED PROCESS UNIT MODIFICATIONS

1.7.6.1. No. 2 Crude Unit

The No. 2 Crude Unit provides the initial separation of crude oil by distillation. The various distillates are then further refined in other processing units in the Refinery. The proposed modifications to the No. 2 Crude Unit include rerouting atmospheric PRDs to the proposed new Vapor Recovery and Safety Flare System. In addition, two knock-out drums will be added to the unit to collect, for recovery purposes, any liquids released from the PRDs in the No. 2 Crude Unit, the No. 2 RSU, and the Minalk/Merox Unit. The purpose of this modification is to voluntarily reduce potential emissions from PRDs that currently vent to atmosphere in the event of a process upset.

1.7.6.2 No. 2 Residuum Stripper Unit

The No. 2 RSU processes the heavy hydrocarbons from the bottom of the No. 2 Crude Unit using vacuum distillation to produce various weight gas oils. The proposed modifications to the No. 2 RSU are limited to rerouting PRDs to the proposed new Vapor Recovery and Safety Flare System via the two new knock-out drums in the No. 2 Crude Unit. The purpose of this modification is to voluntarily reduce potential emissions from PRDs that currently vent to atmosphere in the event of a process upset.

1.7.6.3 Minalk/Merox Unit

The Minalk/Merox Unit converts sulfur compounds (mercaptans) to disulfides using a catalyst. The proposed modifications to the Minalk/Merox Unit are limited to rerouting PRDs to the proposed new Vapor Recovery and Safety Flare System via a new knock-out drum in the No. 2 Crude Unit. The purpose of this modification is to voluntarily reduce potential emissions from PRDs that currently vent to atmosphere in the event of a process upset.

1.7.6.4 Waste Gas Compressors

The Waste Gas Compressors (WGCs) at the No. 2 Crude Unit are currently connected to the Low Sulfur Fuel Oil (LSFO) vapor recovery system and safety flare. As part of connecting PRDs to the New Safety Flare, the WGCs will be rerouted to the New Vapor Recovery and Safety Flare System. The purpose of this modification is to align all PRDs from the No. 2 Crude Unit, No. 2 RSU, Minalk/Merox Unit, and the WGCs to a common vapor recovery and safety flare system.

1.7.6.5 Fluidized Catalytic Cracking Unit

The purposes of the modifications to the FCCU are to increase reliability, consolidate existing equipment, more efficiently separate intermediate streams, increase production of CARB gasoline components, and to improve energy efficiency. The modifications and equipment additions include: installing a new motorized main air blower replacing the existing steam turbine driven main air blower (the existing equipment will be idled and removed from the existing permit); installing a new depropanizer column replacing three smaller existing distillation columns; installing a new deethanizer column; installing new pumps; and, installing new heat exchangers.

1.7.6.6 Alkylation Unit

The Alkylation Unit combines light olefins (propylene, butylene and pentenes) with isobutane to produce an alkylate product for use as a gasoline blending component. The proposed modifications to the Alkylation Unit include supplemental cooling that will be supplied by a new cooling tower and additional heat exchangers. The depropanizer, located in the older section of the Alkylation area, will be removed. This column is one of the three depropanizer columns being removed as part of FCCU upgrades. The purpose of the modifications is to improve reliability through more efficient cooling (i.e., heat removal) and improve product separation in the Unit.

1.7.6.7 Vacuum Residuum Desulfurization Unit

The VRDS Unit desulfurizes and denitrifies gas oil feedstock for the FCCU. The purpose of the modification to the VRDS Unit is to allow taking one of the parallel reactor trains out of service to replace the catalyst while the other train remains in service. The unit modifications and additions include: installing valve manifolds to separate the reactor trains; installing a new, parallel high pressure separator; re-piping of the existing Recycle Hydrogen Heat Exchangers and Recycle Hydrogen Air Coolers to split them between the two trains; and, installing new facilities to allow sulfiding of fresh catalyst in one reactor train with the other train in operation. This includes installation of two new separator vessels, a new sulfiding recycle hydrogen compressor, and a new recycle hydrogen air cooler. In addition, the existing VRDS Product Coolers will be re-piped so they can be used in the catalyst sulfiding loop.

1.7.6.8 ISOMAX Unit

The ISOMAX Unit converts light and intermediate gas oils into jet fuel, motor gasoline, and Liquefied Petroleum Gas (LPG). The unit will be modified to increase the feed capacity by approximately 10,000 barrels per day (BPD), and to produce two additional products, Ultra Low Sulfur Diesel (ULSD) fuel and desulfurized FCCU feed. The purpose of the modifications is to accommodate gas oil production and optimize output from the Unit. Modifications will be made to the Century Type ISOMAX Catalyst for deNitrification (CKN) and distillation sections. A Pressure Swing Absorption (PSA) Unit will be installed to recover hydrogen for reuse in existing Refinery hydrocracking

and hydrotreating processes. Heaters in the ISOMAX Unit will be retrofitted with low nitrogen oxides (NO_x) burners to reduce NO_x emissions. Firing rates for the heaters will operate within existing permit limits.

1.7.6.9 Cogeneration Facilities

The Refinery currently operates a multi-train cogeneration plant to supply most of the electricity and steam used by processing equipment. To supplement electrical needs, electricity is purchased from offsite sources (e.g., SCE). The existing cogeneration facility will be expanded by an additional 49.9 megawatts (MW). The new 49.9 MW Cogen Train D includes a natural gas and refinery gas-fired turbine electric generator, a new steam-driven turbine electrical generator, feed gas compressors, knockout and surge pots, waste heat boilers (including duct burners) to generate steam, a carbon monoxide (CO) oxidation catalyst unit, and a Selective Catalytic Reduction (SCR) unit to control emissions. Expansion of this facility will decrease the Refinery's need for offsite sources of electricity.

1.7.6.10 Railcar Loading/Unloading Rack

The Refinery currently ships and receives LPG by trucks and rail cars. As part of the PRO Project, the LPG Loading/Unloading Rack will be expanded by the addition of four new loading/unloading positions for added flexibility that will increase the ability to optimize CARB-gasoline blending.

1.7.6.11 Utility Improvements

SCE and the WBMWD will improve systems to service the proposed project. SCE improvements expected to be made include adding new 66 kilovolt (kV) circuit breakers in their existing Chevmain Power Substation, new transformers at their existing ISOMAX Power Substation, about 500 feet of overhead or underground cables between the Chevmain Power Substation and the ISOMAX Power Substation, and a new transformer at their Chevgen Power Substation. WBMWD currently provides boiler feed and cooling tower water from secondary-treated effluent from the Hyperion Wastewater Treatment Plant that has been further processed by filtration, chlorination, demineralization by reverse osmosis, and/or denitrification. Improvements as part of the PRO Project at WBMWD, include increasing reverse osmosis and denitrification water production facilities.

1.7.7 PROPOSED NEW PROCESS UNITS

1.7.7.1 Sulfur Recovery Facilities

Sour Water Stripper

A new SWS with a capacity of 300 gallons per minute (gpm) will be constructed to supplement the existing plants. This stripper will allow for increased processing of sour

water and production of commercial grade sulfur. The overhead stream from the stripper, containing hydrogen sulfide (H₂S), ammonia and water vapor, will be fed to a new SRU.

Sulfur Recovery Unit

A new SRU with a capacity of 175 long tons per day will be installed to process increased amounts of H₂S to commercial grade, molten sulfur for sale. Ammonia in the feed stream to the SRU will be converted to atmospheric nitrogen and water and exhausted through the TGU to the atmosphere.

Tail Gas Unit

The exhaust from the SRU will be vented to a new TGU for further processing before discharging to the atmosphere. The TGU will include a new incinerator.

1.7.7.2 Vapor Recovery and Safety Flare System

A new closed relief system, including vapor recovery compressors and an elevated safety flare, will be installed that is designed to be capable to handle emergency releases from the equipment that is connected to it. The PRDs on the No. 2 Crude Unit, the No. 2 RSU, and the Minalk/Merox Unit that currently may vent to atmosphere under upset conditions will be routed to this new Vapor Recovery and Safety Flare System. The existing WGCs currently routed to the LSFO vapor recovery system will be re-routed to this new Vapor Recovery and Safety Flare System. In addition, PRDs from the new SWS, SRU and TGU will be routed to this new Vapor Recovery and Safety Flare System. The recovered gases will be treated prior to being added to the existing refinery fuel gas system.

1.7.7.3 Additional Storage Capacity

The proposed project will require additional segregation and storage of intermediate hydrocarbon streams and products. A new LPG sphere (Tank 722), two new FCCU light gasoline tanks (Tanks 302 and 303), and a new ISOMAX diesel tank (Tank 447) with the flexibility to store other products will be added. In addition, new pumps will be added to transfer materials to and from the new tanks.

1.7.7.4 Cooling Tower

A new cooling tower with a water circulation rate of approximately 12,000 gpm will be constructed to support cooling needs at the existing Alkylation Unit, new SRU, new SWS, and new TGU.

1.7.7.5 Hydrogen Compression and Transfer Facilities

Hydrogen is currently produced onsite at the Refinery. Additional hydrogen compression and transfer facilities will be installed to supply Refinery units with hydrogen at the required pressures.

1.7.8 CONSTRUCTION OF THE PROPOSED PROJECT

Construction activities for the Chevron Products Company PRO Project are expected to begin in the second quarter of 2008 and be completed in 2010. The construction activities for most of the components are expected to overlap from the second quarter of 2008 until the fourth quarter of 2009. 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 to take advantage of the disruption in operation.

1.7.9 OPERATION OF THE PROPOSED PROJECT

The permanent work force at the Refinery is expected to increase by approximately 12 additional workers as a result of the proposed project. The proposed project is expected to incrementally reduce truck traffic by about two trucks per day associated with the transport of additional materials to and from the Refinery including among other things, catalyst deliveries and offsite shipments of commercial sulfur and ammonia products. In addition, a maximum of about 12 additional railcars per day could travel to and from the Refinery as a result of the proposed project.

1.8 EXECUTIVE SUMMARY – CHAPTER 3: EXISTING ENVIRONMENTAL SETTING

This chapter presents the existing environmental setting for the proposed project and compares it to the potential impacts of the proposed project that have been previously evaluated. This EIR is focused only on the environmental topics identified in the NOP/IS (see Appendix A) that could be significantly adversely affected by the proposed project. The environmental topics identified in Chapter 3 include both a regional and local setting.

1.8.1 AIR QUALITY

The Chevron Products Company Refinery is located within the SCAQMD's jurisdiction. Over the last decade and a half, air quality has substantially improved within the district. Nevertheless, several air quality standards continue to be frequently exceeded by a wide margin. For example, of the National Ambient Air Quality Standards (NAAQS) established for six criteria pollutants, the district is in attainment for four (sulfur oxide, (SO_x), NO_x, CO and lead). VOC, a precursor to ozone and particulate matter (PM) are in non-attainment with the standards.

Chapter 3 discusses the effects of meteorological conditions, temperature and rainfall, and wind flow patterns on the existing air quality conditions in the South Coast Air Basin (Basin). Existing air quality will be examined regarding criteria pollutants, regional air quality, local air quality, the Refinery's criteria pollutant emissions, toxic air contaminants (TACs), as well as the regulatory setting.

1.8.2 ENERGY

The major sources of energy in California come from intrastate, interstate and foreign sources. Power plants in California provided approximately 78 percent of the in-state electricity demand in 2006. Hydroelectric power from the Pacific Northwest provides another 7 percent, and power plants in the Southwestern U.S. provide another 15 percent. California is currently ranked fourth in the nation among oil producing states, behind Louisiana, Texas, and Alaska, respectively. Crude oil production in California averaged 731,150 BPD in 2004, a decline of 4.7 percent from 2003. Statewide oil production has declined to levels not seen since 1943. In 2005, the total receipts to refineries of roughly 674 million barrels came from in-state oil production (39.4 percent), combined with oil from Alaska (20.1 percent), and foreign sources (40.4 percent) (CEC, 2006b).

Chapter 3 discusses the existing setting regarding demand, supply and distribution of energy resources on a state and local basis, with electricity and liquid petroleum fuels providing the main topics.

1.8.3 HAZARDS AND HAZARDOUS MATERIALS

The Refinery handles hazardous materials with the potential to cause harm to people, property, or the environment. An accidental release of hazardous materials at a facility can occur due to natural events, such as earthquakes, and non-natural events, such as mechanical failure or human error. Potential existing hazards from the Refinery are those associated with accidental releases of toxic/flammable gas, toxic/flammable liquefied gas, and flammable liquids. Typical hazards at a refinery include toxic gas clouds, fires, vapor cloud explosions, thermal radiation, and overpressure. State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or mitigate injury to human health or the environment in the event that such materials are accidentally released.

1.8.4 HYDROLOGY/WATER QUALITY

Water issues in the Los Angeles Basin are complex and affect supply, demand, and quality of water for domestic, commercial, industrial, and agricultural use. Since 1900, extensive water development has been carried out in the Los Angeles Basin. The Refinery currently consumes approximately 10 million gallons of water per day.

The Chevron Refinery is located adjacent to the Santa Monica Bay on the Pacific Ocean. The Bay is recognized by the United States Environmental Protection Agency (U.S. EPA) and the State as a natural resource of national significance. Effluent Limitations

and Performance Goals are established in Chevron's National Pollutant Discharge Elimination System (NPDES) Permit (No. CA0000337) for the protection of marine aquatic life and human health. Under its NPDES Permit, the Chevron Refinery is authorized to discharge up to 8.8 million gallons per day (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.

Refinery wastewater is currently collected and treated in two separate drain and treatment systems: a segregated system and an unsegregated system. The unsegregated system is normally used for non-process wastewater, including cooling tower blowdown, steam condensate, a portion of the water pumped from groundwater recovery wells, and other wastewater streams containing free oil recovered with primary (physical) treatment only. The unsegregated system is also used to collect and treat stormwater.

The segregated system is normally used to treat process wastewater containing emulsified oil, organic chemicals, and a portion of the water pumped from groundwater recovery wells. This system consists of gravity separators, a dissolved air flotation (DAF) unit, and activated sludge units for secondary (biological) treatment. The biosolids from the biological treatment are disposed to the sanitary sewer for treatment by the Hyperion Treatment Plant under an Industrial Waste Discharge Permit.

Two auxiliary effluent diversion tanks are available for handling wastewater from either of the two systems and excess storm-water runoff. During severe rainstorms, excess runoff is collected and pumped into the diversion tanks, which have a holding capacity of about 13.8 million gallons. From the tanks, water can be routed to either system for treatment prior to discharge.

The wastewater is discharged through an outfall that is located approximately 3,500 feet offshore. Currently, the Refinery discharges approximately seven million gpd of treated wastewater during dry weather, and 21.5 million gpd during wet weather, both within the authorized discharge permitted. The 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.

1.8.5 NOISE

Land use in the vicinity of the Refinery is generally designated commercial and residential to the north; industrial, open, and public land to the east; residential to the south; and industrial to the west. The ambient noise environment in the project vicinity is composed of the contributions from equipment and operations within these commercial and industrial areas, and from the traffic on roadways along or near each of its property boundaries.

The nearest sensitive noise receptors south of the Refinery are residences located in the City of Manhattan Beach, approximately 200 to 400 feet south of the Refinery along Rosecrans Avenue. The nearest sensitive noise receptors north of the Refinery are

commercial receptors along El Segundo Boulevard and residences along Lomita Avenue and Grand Avenue approximately one-eighth mile north of the Refinery.

Based on a recent noise survey performed on October 5 through October 9, 2007 to determine the existing ambient noise levels in the vicinity of the Refinery, the Community Noise Equivalent Level (CNEL) ranges between 63 A-weighted noise level measurement is decibels (dBA) and 69 dBA.

1.8.6 SOLID/HAZARDOUS WASTE

As of January 2006, the total remaining permitted Class III landfill capacity in Los Angeles County is about 104 million tons for non-hazardous solid waste. The Los Angeles County Department of Public Works (LACDPW) anticipates that landfill capacity in the county could be exceeded in approximately 10.8 years. The Los Angeles County Sanitation Districts (LACSD) is currently exploring out-of-county disposal options in addition to continuing negotiations to extend current operating permits, as well as implementing waste management plans of source reduction and recycling.

The total remaining permitted inert waste capacity in Los Angeles County is estimated at approximately 46 million tons. There are currently two waste-to-energy facilities (i.e., incinerators) in Los Angeles County with a combined permitted daily capacity of 1,800 tons (six-day week). It is expected that these two facilities will operate at their current permitted daily capacity until the equipment life of the waste-to-energy facilities (incinerators) is exhausted (LACDPW, 2007).

Two hazardous waste landfill facilities are located in California, Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King's County, and the Clean Harbors (formerly Safety-Kleen) facility in Buttonwillow (Kern County). Kettleman Hills receives an average of 2,700 tons per day (tpd) and has an estimated two million cubic yard capacity. Buttonwillow receives approximately 960 tons of hazardous waste per day and has an approximate remaining capacity of approximately 8.8 million cubic yards. The expectant life of the Buttonwillow Landfill is approximately 40 years. Hazardous waste also can be transported to permitted facilities outside of California.

1.8.7 TRANSPORTATION AND TRAFFIC

The operating characteristics of an intersection are defined in terms of the Level of Service (LOS), which describes the quality of traffic flow based on variations in traffic volume and other variables such as the number of signal phases. Intersections rated at LOS A to C operate well. Level D typically is the level for which a metropolitan area street system is designed. Level E represents volumes at or near the capacity of the highway, which will result in possible stoppages of momentary duration and fairly unstable traffic flow. Level F occurs when a facility is overloaded and is characterized by stop-and-go (forced flow) traffic with stoppages of long duration.

Peak hour LOS analyses were developed for intersections in the vicinity of the Refinery. The LOS analysis indicates typical urban traffic conditions in the area surrounding the Refinery, with all intersections, except one, currently operating at Levels A to D during morning peak hours (7 am – 9 am). One intersection currently operates at LOS E during morning peak hours, Sepulveda/El Segundo Boulevard. The evening peak hour conditions (4 pm – 6 pm) show overloaded conditions (LOS F) at two intersections, operating near capacity (LOS E) at one intersection, operating at LOS C at one intersection, operating at LOS D at one intersection, and the remainder of the intersections currently operating at LOS A to B.

1.9 EXECUTIVE SUMMARY – CHAPTER 4: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Chapter 4 assesses the potential environmental impacts of the construction and operation of the Chevron Products Company El Segundo Refinery PRO Project. Chapter 4 evaluates those impacts that are considered potentially significant under the requirements of CEQA, as determined by the NOP/IS (see Appendix A). Specifically, an impact is considered significant under CEQA if it leads to a “substantial, or potentially substantial, adverse change in the environment.” Table 1-1 (located at the end of this chapter) summarizes the impacts of the proposed project.

1.9.1 AIR QUALITY

1.9.1.1 Environmental Impacts

Project-specific 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 are discussed in Chapter 4, as well as impacts to sensitive receptors.

Construction activities vary for the different portions of the proposed project, but construction activities overlap for a number of portions of the project. Therefore, emission calculations evaluated in Chapter 4 were based on the schedule presented in Chapter 2. Peak construction emissions for all pollutants except particulate matter less than 10 microns in diameter (PM10) and particulate matter less than 2.5 microns in diameter (PM2.5) are expected to occur in January 2009, with peak PM10 and PM2.5 emissions expected to occur in August 2008. The construction emissions are expected to be significant for CO, volatile organic compounds (VOCs), NOx, PM10, and PM2.5 following mitigation. Construction emissions are expected to be less than significant for SOx.

The peak construction emissions were modeled to determine the potential impacts on ambient air quality. Based on the Industrial Source Complex – Short Term (ISCST3) model, the ground level concentrations of the criteria pollutants of concern will be below

the significant change in air quality concentration. Therefore, no significant change in the local concentrations of criteria pollutants is expected.

Traffic impacts were analyzed to determine if significant traffic impacts could generate a significant increase in CO emissions. The intersection of Aviation Boulevard and El Segundo Boulevard has a potential to have significant traffic impacts during the construction phase. A CO Hotspots Analysis was completed to assess the impacts of the traffic on CO ambient air quality. Based on the analysis, it was 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.

The proposed project operational emissions are also evaluated in Chapter 4. The primary sources of emissions are from new units including sulfur processing facilities, a Vapor Recovery and Safety Flare System, and from modifications to existing Refinery units. 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, NO_x, SO_x, PM₁₀, or PM_{2.5} during operation. VOC emissions will be offset for stationary sources, which will mitigate the VOC emissions to less than significant.

Based on the air quality modeling and related assumptions, the cancer risks to the Maximum Exposed Individual Worker (MEIW), the Maximum Exposed Individual Resident (MEIR) and the nearest sensitive receptor associated with the proposed project at the Refinery were calculated to be 0.22×10^{-6} , 0.33×10^{-6} , and 0.16×10^{-6} respectively, or less than one in a million. This result does not exceed the cancer risk significance threshold of 10 per million.

The highest acute hazard index for the proposed project is estimated to be 0.0307 for the central nervous system, while the highest chronic hazard index for the proposed project is estimated to be 0.0066 for the reproductive system. The acute and chronic hazard indices for the proposed project do not exceed the relevant significance threshold of 1.0, therefore, no significant adverse acute or chronic health impacts are expected.

1.9.1.2 Mitigation Measures

Mitigation measures will be imposed on the project to reduce emissions associated with construction activities from heavy construction equipment and worker travel. The appropriate mitigation measures are discussed in Chapter 4.

No mitigation measures are required for the operation phase of the project because all emissions were determined to be less than significant, except for VOC emissions that require offsets for stationary sources. Once offset, the VOC emissions will be less than significant. Operational VOC emissions from mobile source emissions (2.8 lbs/day) do not require offsets, and are less than significant so no further mitigation is required.

1.9.1.3 Level of Significance after Mitigation

Construction emissions for the proposed project for CO, VOCs, NO_x, PM₁₀, and PM_{2.5} are expected to remain significant following mitigation. The construction emissions associated with SO_x 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.

Localized significant impacts from construction activities were analyzed and determined that no significant change in local ambient air quality for nitrogen dioxide (NO₂), CO, or PM₁₀ is expected for the proposed project. Therefore, the proposed project is not expected to cause a significant adverse impact on ambient air quality.

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. Therefore, no mitigation would be required.

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, NO_x, SO_x, PM₁₀, or PM_{2.5} during operation. VOC emissions will be offset, which will mitigate VOC emissions to less than significant.

The proposed project was analyzed for health impacts and determined to be less than significant. Therefore, the project is not expected to cause a potentially significant adverse impact on air quality.

1.9.2 ENERGY

1.9.2.1 Environmental Impacts

The proposed project includes new equipment that will require additional electricity. The proposed project also includes new cogen equipment that will produce additional electricity. The estimated increase in electricity demand from new equipment is about 29.9 MW. The proposed expansion to the existing multi-train Cogen Facility would increase the Refinery's electrical production by an additional 49.9 MW. The expansion of the Cogen Facility will allow the Refinery to produce all of the electricity required to operate the Refinery in the long-term, thus, reducing electricity purchases from SCE. Therefore, the project impacts on the electricity supply are considered to be beneficial.

1.9.2.2 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.

1.9.2.3 Level of Significance after Mitigation

The proposed project is expected to generate sufficient electricity so that no significant energy impacts are expected.

1.9.3 HAZARDS AND HAZARDOUS MATERIALS

1.9.3.1 Environmental Impacts

The potential hazards (fires, explosion overpressure, thermal radiation, or release of H₂S) from the new or modified units associated with the proposed project and the results of the modeling for these hazards are discussed in Chapter 4. The hazards analysis can be found in Appendix D. For each potential release, the distance to the significance threshold level was determined before and after the proposed project modifications (where applicable). None of the existing or modified units have the ability to create a hazard that could extend further off-site. 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.

1.9.3.2 Mitigation Measures

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

1.9.3.3 Level of Significance Following Mitigation

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

1.9.4 HYDROLOGY/WATER QUALITY

1.9.4.1 Environmental Impacts

Regarding water supply, 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 increase in water demand is expected to be met by existing sources of water supplied by WBMWD.

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.

With respect to wastewater, the Refinery currently discharges approximately seven million gpd of treated wastewater to the Santa Monica Bay. It is expected that the proposed project will increase the wastewater discharge by about 223,200 gpd. The wastewater treatment system at the Refinery has sufficient capacity to treat the incremental increase in wastewater produced from the proposed project. Therefore, the proposed project is not expected to change the quality of wastewater produced by the Refinery.

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. Following project completion, the total volume of wastewater generated would be about 7,223,200 gpd, which is within the capacity of the existing permit.

1.9.4.2 Mitigation Measures

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

1.9.4.3 Level of Significance after Mitigation

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

1.9.5 NOISE

1.9.5.1 Environmental Impacts

The highest noise impacts from construction activities will be during installation of new and modified process units. Noise sources for the proposed project include heavy construction equipment which will be a source of noise over the approximately two and a half year construction period. The estimated noise level during installation of new and modified process units at the Refinery is expected to average about 85 decibels (dBA) at 50 feet from the center of construction activity for each unit.

The noise levels from the construction equipment at the Refinery are expected to be within the allowable levels established by the City of El Segundo noise ordinance, and increases during construction activities are not expected to exceed 1.2 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.

The proposed project will also add equipment to the existing Refinery resulting in additional noise sources from operational activities. Additional noise sources associated

with the proposed project generally include process equipment components such as valves, flanges, ejectors, heat exchangers, vents, pumps, and compressors. Noise impacts associated with the proposed project were evaluated using noise modeling (see Appendix E). 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. The noise levels in the area following completion of the proposed project are expected to be about the same as the current levels.

1.9.5.2 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.

1.9.5.3 Level of Significance Following Mitigation

The proposed project is expected to be less than significant, so no significant impacts on noise are expected.

1.9.6 SOLID/HAZARDOUS WASTE

1.9.6.1 Environmental Impacts

Due to construction activities associated with the proposed project, an increase is expected in the generation of non-hazardous wastes resulting from demolition of existing structures, grading to provide foundations for new structures, and the installation new structures. Approximately 1,075 tons of municipal (non-hazardous) solid waste would be generated from the proposed project. 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.

Construction of the proposed project is also anticipated to generate approximately 1,200 tons of hazardous waste. Additionally, Chevron estimates that a total of approximately 5,900 tons of contaminated soil may be excavated during construction of the proposed project. There is adequate capacity at the two Class I landfills in California approved to accept hazardous waste.

The operation of the proposed project is expected to require increased amounts of catalyst and generate increased amounts of catalyst waste. 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.

1.9.6.2 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.

1.9.6.3 Level of Significance after Mitigation

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

1.9.7 TRAFFIC AND TRANSPORTATION

1.9.7.1 Environmental 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. Because the daytime construction shift starts at 6:30 a.m., worker traffic attributable to project construction will not affect the morning peak hour (7:00 am to 9:00 am). 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.

The construction phase of the proposed project could result in potentially significant traffic impacts at one intersection (Aviation Boulevard and El Segundo Boulevard). In addition, traffic impacts are also potentially significant for the southbound lanes of the San Diego Freeway (I-405) between Rosecrans Avenue and El Segundo Boulevard and the northbound lanes of I-405 between El Segundo Boulevard and Alen M. Anderson Freeway (I-105) interchange. Sufficient parking for the peak estimate of 900 workers is not available at the Chevron Refinery. Therefore off-site parking areas will be used and workers will be transported to and from the Refinery.

Operational impacts from the proposed project are expected to require 12 additional permanent workers at the Refinery, generating 24 additional trips per day. The proposed project will result in increases in truck trips to provide supplies and materials, as well as to deliver products and wastes. The proposed project is also expected to reduce the production and sales of anhydrous ammonia from the Refinery, thus reducing overall truck trips from the Refinery by about two per day.

1.9.7.2 Mitigation Measures

Because of the temporary nature of the construction traffic, 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 and encourage ridesharing and transit use. Preferential parking for rideshare vehicles will be provided for construction workers. The traffic analysis assumes that no ridesharing will occur and provides a worst-case estimate of project impacts. However, ridesharing during construction activities is common and will help decrease traffic impacts. The amount of ridesharing that will occur cannot be predicted so traffic impacts are assumed to remain significant.

1.9.7.3 Level of Significance after Mitigation

Mitigation measures have been included as part of the proposed project that are expected to reduce traffic impacts during the construction phase. However, construction traffic impacts are expected to remain significant. The construction traffic impacts will cease following completion of the construction phase. The operational impacts of the project on transportation/traffic are less than significant.

1.10 EXECUTIVE SUMMARY – CHAPTER 5: SUMMARY OF CUMULATIVE IMPACTS

CEQA Guideline §15130(a) requires an EIR to discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in §15065(a)(3). There are a number of projects proposed for development in the vicinity of the Refinery, which may contribute cumulative impacts to those generated by the proposed PRO Project. The discussion in Chapter 5 lists projects which are reasonably expected to proceed in the foreseeable future, i.e., project information has been submitted to a public agency.

1.10.1 AIR QUALITY

1.10.1.1 Environmental Impacts

Construction Impacts: Construction activities for some of the projects described in Chapter 5 have the potential to overlap with the proposed Chevron project and result in short-term significant impacts on air quality. On a cumulative basis, construction emissions would exceed SCAQMD CEQA thresholds for CO, VOC, NO_x, PM₁₀, and PM_{2.5}. Therefore, the air quality impacts associated with construction activities are considered significant. Mitigation measures to reduce air emissions associated with cumulative construction activities are necessary primarily to control emissions from heavy construction equipment and worker travel.

Operational Impacts: During operation, some of the projects are expected to reduce overall air pollutant emissions. However, there are localized increases for certain air pollutants. Direct stationary emission sources are generally subject to regulation. The operation of the Chevron project will not exceed the SCAQMD thresholds, after

mitigation, so no significant, project-specific air quality impacts are expected from the proposed project.

However, cumulative air quality impacts are expected to exceed the SCAQMD mass emission thresholds for CO, VOC, NO_x, SO_x, and PM₁₀. Therefore, the cumulative air quality impacts for CO, VOC, NO_x, SO_x, and PM₁₀ are expected to be significant.

Toxic Air Contaminants: The proposed project impacts on health effects associated with exposure to TACs is expected to be below the CEQA significance thresholds and, therefore, less than significant. Therefore, the proposed project impacts are not expected to contribute to cumulative impacts and are not considered to be cumulatively considerable. The impacts from TACs are localized impacts. The only other major industrial project in the area is the El Segundo Power Plant Redevelopment Project. The potential overlap of the El Segundo Power Plant and the Chevron PRO Project would be well below the significance criteria of 10 per million for carcinogenic risk and 1.0 for the acute and chronic hazard indices. Cumulative impacts of TACs on health are expected to be less than significant.

Green House Gases: Global climate change refers to changes in average climatic conditions on earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of greenhouse gases (GHGs) in the atmosphere. Some studies indicate that the potential effects of global climate change may include rising surface temperatures, loss in snow pack, sea level rise, more extreme heat days per year, and more drought years. Events and activities, such as the industrial revolution and the increased consumption of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. As reported by the California Energy Commission (CEC), California contributes 1.4 percent of the global and 6.2 percent of the national GHGs emissions.

In response to growing scientific and political concern regarding global climate change, California has recently adopted a series of laws to reduce both the level of GHGs in the atmosphere and to reduce emissions of GHGs from commercial and private activities within the State.

Chevron has reported its GHG emissions to the California Climate Action Registry for the years 2004-2006, which were approximately 13.1 million metric tons per year for all sources in California. The total statewide net GHG emissions in 2004 were approximately 480 million metric tons per year for carbon dioxide (CO₂) equivalent (CO₂e) emissions. Global emissions of GHGs in 1990 were estimated by the Intergovernmental Powers on Climate Change to be 32,100 million metric tons for CO₂e emissions. The two-year average GHG emissions from the Chevron El Segundo Refinery for 2005-2006 were calculated to be 3.588 million metric tons. The major source of emissions is combustion of fuel in heaters and boilers.

The new and modified equipment built as part of the Chevron PRO Project has been evaluated for all GHG emission sources, including both energy supplied via purchased conventional power generation and with energy supplied by the installation of more energy efficient cogeneration power (combined power and steam generation). The PRO Project as proposed is estimated to result in an increase of 0.194 million metric tons/year of GHGs with GHG emission increases generated from Cogen Train D, the tail gas treating unit, and the pilots on the new flare.

Chevron evaluated the electrical needs of the PRO Project and determined that the proposed project would require about 29.9 MW of electricity plus additional steam to operate the proposed new and modified units. The business-as-usual approach would be to purchase the additional electricity from the local provider (SCE). If the Refinery were to continue to rely on SCE for electricity, a new 330 mmBtu/hr boiler would be required to generate additional steam needed for the PRO Project and other Refinery activities. The GHG emissions that would be generated under the business-as-usual approach are estimated to be about 0.281 million metric tons per year.

Instead of business-as-usual, Chevron is proposing to install a new 49.9 MW cogeneration unit to supply the additional electricity and steam, and to reduce the amount of electricity purchased from the local provider. The steam required by the proposed project and other refinery activities can be generated by the Cogen Train D so that no new boiler is required. Although the operation of the new Cogen Train D will result in an increase in GHG emissions at the Refinery, the new Cogen Train D will eliminate the purchase of electricity from less energy efficient sources. It is estimated that the PRO Project with the Cogen Train D would generate about 0.089 million metric tons/yr (0.281 – 0.192) less GHG emissions than the PRO Project with a new boiler plus SCE supplied power, i.e, business-as-usual.

The major contributor of greenhouse gases in the PRO Project, the new Cogen Train D, is, in itself, one of the preeminent technologies for minimizing GHG emissions. Cogeneration is far more efficient (in both energy and GHG emissions), than separate generation of electricity and steam. Installing Cogen Train D as part of the PRO Project is consistent with the California Air Pollution Control Officer's Association's (CAPCOA's) Green List of Projects and, thus, the goals of AB32.

The California Public Utility Commission (CPUC) and CEC have established emissions performance standards for the generation of electricity. In order to evaluate compliance with the standard, the thermal output of Cogen Train D was calculated and compared to the emissions performance standard. The efficiency of the Cogen Train D is estimated to be 591 lbs of CO₂e per MW-hr which is well below the emissions performance standard of 1,100 pounds of CO₂ per MW-hr. Therefore, the proposed Cogen Train D will be more energy efficient than required by CPUC and CEC standards, generating lower CO₂ emissions per MW-hr than required by CPUC and CEC standards.

For comparison purposes and consistency with the goals of AB32, the GHG emissions from the Chevron El Segundo Refinery have also been evaluated for the 1990 operating

conditions using historical operating data. The 1990 GHG emissions for the Refinery are estimated to be about 3.9 million metric tons of GHGs per year as compared to the 2010 GHG emission estimates of 3.588 million metric tons. In the years since 1990, the Refinery has implemented a number of projects to improve energy efficiency (thereby reducing GHG emissions) and, in one case, to directly reduce CO₂ emissions from the Steam Naphtha Reformer. GHG emissions from the Refinery will be less than the Refinery 1990 baseline - outpacing AB32's goal of reducing to 1990 emission levels by 2020. Through the use of a highly energy efficient cogeneration system, the PRO Project exhibits a highly favorable level of carbon intensity compared to traditional technologies.

In spite of all the past projects undertaken by Chevron and a proactive approach to reducing GHG emissions from the proposed project through the installation of a cogeneration unit, rather than taking a business-as-usual approach (i.e., installing a new boiler and increasing demand for electricity from SCE), the cumulative increase in GHG emissions from the proposed project of 0.194 million metric tons per year is concluded to be significant. Given the position of the legislature on AB32, which states that global warming poses serious threats to the environment, and the requirements of CEQA for the lead agency to determine whether a project will have a significant impact, the overall effect of 0.194 million metric tons per year of GHG emissions is considered cumulatively considerable. Thus, the cumulative greenhouse gas impacts from the proposed project are considered significant. This determination is based on the lack of clear scientific or other criteria for determining the level of significance of the project's contribution to global warming and adverse changes in climate conditions.

To offset GHG emissions from the PRO Project with the new Cogen Train D at the Refinery, Chevron shall offset the GHG emissions resulting from the proposed PRO Project through the purchase of CO₂ emission reduction credits. Chevron will make a contribution to the SoCal Climate Solutions Exchange of \$1,500,000 to produce verifiable and quantifiable permanent GHG emission reductions under District SoCal Climate Solutions Exchange and thus offset the net increase in the PRO Project GHG emissions (see Section 5.2.4.4 for further details on the GHG mitigation measures). Through implementation of these mitigation measures, the cumulative impacts of GHG emissions associated with the proposed PRO Project would be less than significant.

1.10.1.2 Mitigation Measures

For the construction period, the mitigation measures developed as part of the proposed Chevron project will be imposed on other related projects, if the SCAQMD is the lead agency and project-specific impacts are concluded to be significant. The mitigation measures to minimize emissions associated with operation of stationary sources of the related projects include the use of BACT for all new emission sources and modifications to existing sources. BACT would be required for stationary sources regardless of whether the SCAQMD is the lead agency or is a responsible agency. The use of BACT would control localized emissions. A BACT review will be completed during the SCAQMD permit approval process for all new/modified sources.

1.10.1.3 Level of Significance Following Mitigation

The cumulative adverse air quality impacts due to construction activities are expected to exceed the SCAQMD significance thresholds for all criteria pollutants except SO_x and are considered to be cumulatively considerable, even after mitigation. The cumulative air quality impacts due to operational activities are expected to exceed the SCAQMD significance thresholds for all pollutants and are considered to be cumulatively considerable. The project-specific TAC health impacts would not be significant, and are not considered to be cumulatively considerable. GHG emission impacts are expected to be less than significant after mitigation, through the use of GHG emission offsets.

1.10.2 ENERGY

The project's contribution to energy impacts is not cumulative considerable and, thus, not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

1.10.2.1 Environmental Impacts from Construction and Operations

The Chevron PRO Project and other projects will consume additional electricity. The new office and commercial buildings are expected to consume additional electricity, while other projects at the Chevron Refinery (e.g., new Chevron administration building, No. 2 Cutpoint Project, LPG Rack Segregation, new jet tank and remodeling of the purchasing building) are not expected to require additional electricity. The PRO Project and the El Segundo Power Plant project will produce additional electricity, 49.9 MW and 280 MW, respectively. As a result, the cumulative projects are not expected to result in significant increases in electrical demand and will produce electricity. No significant cumulative energy impacts are expected.

1.10.2.2 Mitigation Measures

New development will be required to comply with Uniform Building Code requirements which establish energy conservation standards for new construction. These standards are related to insulation requirements, glazing, lighting, shading, window requirements, and water and space heating systems. Implementation of the energy conservation requirements is expected to minimize cumulative energy impacts.

1.10.2.3 Level of Significance After Mitigation

The impacts of the various projects on energy are not expected to be cumulatively considerable, as some of the projects will generate additional electricity, which will compensate for demand.

1.10.3 HAZARDS/HAZARDOUS MATERIALS

The project’s contribution to hazards and hazardous materials impacts is not cumulative considerable and thus not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

1.10.3.1 Environmental Impacts from Construction and Operations

Although other industrial facilities exist in the general vicinity of the Refinery, the cumulative impacts, from and between the onsite operation of the other industrial projects, are not expected to be significant because it is extremely unlikely that upset conditions would occur at more than one facility at a time. Further, hazard impacts at industrial facilities are not expected to overlap because of the distance between facilities. It also is extremely unlikely that an upset condition at one facility would create an upset at another nearby industrial facility because of the distance between facilities. The new project-related explosion or fire hazard impacts associated with the proposed project are expected to stay within the confines of the existing Refinery or travel no further than existing hazards. Therefore, explosion or fire hazards are not expected to reach or overlap with hazard impacts from other industrial projects, so hazard impacts are not expected to be cumulatively considerable.

1.10.3.2 Mitigation Measures

The proposed project impacts on hazards are considered to be less than significant. A number of existing rules and regulations apply to the Refinery and other industrial facilities that handle, transport or store hazardous materials. Compliance with these rules and regulations is expected to minimize industry-related hazards. Compliance with these rules and regulations should also minimize the hazards at other industrial facilities. Site-specific mitigation measures for hazards may be required for other projects.

1.10.3.3 Level of Significance After Mitigation

The impacts of the various projects on hazards are not expected to be cumulatively considerable as hazards at or within one project area are not expected to impact or lead to hazards at other facilities.

1.10.4 HYDROLOGY/WATER QUALITY

The PRO Project’s contribution to hydrology/water quality impacts is not cumulative considerable and thus not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

1.10.4.1 Environmental Impacts from Construction and Operations

Water Supply/Demand: The Chevron PRO Project includes modifications to allow the increase production and use 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 one million gallons per day) will be reclaimed water.

In addition to the proposed Chevron project, the El Segundo Power Plant is expected to require about 207,000 gpd of additional water. Water demand impacts from the power plant are expected to be mitigated by the use of recycled water for some purposes. The other related projects are limited to office buildings, commercial buildings, and some residential buildings, which are not expected to be major users of water. The cumulative increase in water use is expected to be less than the SCAQMD's significance threshold of five million gpd. Therefore, the proposed project and the cumulative projects are not expected to produce significant adverse cumulative impacts to water demand.

Wastewater: The proposed project is anticipated to increase wastewater discharge from the Chevron Refinery by about 223,200 gpd. Wastewater generated by Chevron is treated on-site prior to discharge. No significant impacts associated with wastewater discharge is expected from the Chevron PRO Project.

The total sewage generated by the other cumulative projects in the El Segundo area is estimated to be about one million gpd (see Table 5-10) and most of these facilities are expected to discharge to the LACSD sewage system which is treated by the Joint Water Pollution Control Plant (JWPCP). The JWPCP has a design capacity of about 385 million gpd and currently process an average flow of 323 million gpd. Therefore, JWPCP has sufficient sewage treatment capacity to accommodate the sewage from the cumulative projects. Therefore, impacts to sewage service would not be cumulatively considerable.

1.10.4.2 Mitigation Measures

The proposed project impacts on hydrology/water quality were less than significant. Since no cumulative impacts were identified, no mitigation measures are required.

1.10.4.3 Level of Significance After Mitigation

The cumulative impacts on hydrology/water quality are considered to be less than significant.

1.10.5 NOISE

The Chevron PRO Project's contribution to noise impacts is not cumulative considerable and thus not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

1.10.5.1 Environmental Impacts from Construction

Construction phases of each of the related projects are expected to generate localized, short-term noise impacts, some of which may be significant during construction. Construction activities associated with the industrial projects are located in industrial areas where limited sensitive receptors are located. The use of muffling devices, restriction of most construction work hours to daytime hours, etc., are expected to mitigate the increase in noise at most of the construction sites.

The cumulative construction impacts associated with the related industrial projects are not expected to be significant or exceed noise ordinances. The Refinery and other industrial projects are generally a sufficient distance apart that the noise levels are not expected to overlap. Some of the commercial/office buildings on-site are located close to residential and other sensitive receptors and may create noise impacts in residential areas. Construction activities are expected to be limited to daytime hours, which reduce the potential for impacts on sensitive receptors.

1.10.5.2 Environmental Impacts from Operations

The operational noise impacts of the industrial projects are not expected to be significant. The noise impacts at the Chevron Refinery are not expected to result in a noticeable change to the surrounding community. The mitigated operational noise at the southern boundary of the El Segundo Power Plant project is predicted to be no greater than 52 dBA. This noise level is less than the SCAQMD's significance threshold of 90 dBA at the property boundary. Therefore, the noise due to the new generators is not expected to have a significant noise effect and the noise would not overlap with other existing or new noise sources at the Chevron Refinery. In addition, existing traffic noise levels are significant in the Vista Del Mar Boulevard corridor which runs between the power plant and the Refinery, generating a large portion of the community noise levels.

Most of the noise associated with other cumulative projects (e.g., commercial and office buildings) is expected to be primarily associated with traffic. Sufficient distance separates the Refinery from most of the other projects, thus, it is unlikely that noise impacts will overlap.

1.10.5.3 Mitigation Measures

Since noise impacts from the Refinery proposed project are not considered to be cumulatively considerable, they do not contribute to significant adverse cumulative worse impacts. As a result, no mitigation measures are required.

1.10.5.4 Level of Significance After Mitigation

The noise impacts associated with the cumulative projects are not expected to be significant or contribute to significant adverse cumulative noise impacts during construction or operation.

1.10.6 SOLID/HAZARDOUS WASTE

The Chevron PRO Project's contribution to solid and hazardous waste impacts is not cumulative considerable and thus not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

1.10.6.1 Environmental Impacts from Construction and Operations

Hazardous Waste: The Chevron Refinery and El Segundo Power Plant projects are the main industrial developments in the area that have the potential to generate hazardous waste either through remediation activities or through the discovery of contaminated soils. The total amount of hazardous waste generated by contaminated soil is uncertain but maximum estimates are about 6,975 tons will be generated at the Chevron site and about 4,000 tons at the El Segundo Power Plant. The impacts would be considered adverse but not significant since the existing hazardous waste facilities likely have sufficient capacity to handle the one-time deposition of hazardous wastes that would likely be generated, e.g., contaminated soils. However, the additional waste streams may impact the dwindling capacity of certain landfills. Together, the landfills in California have 10.8 million cubic yards permitted 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 cumulative impact of the generation hazardous waste is not considered a significant impact.

Most of the hazardous waste generated during the operational phase of the industrial projects include used oil and spent catalysts, which are expected to be recycled for their economic value. The office, commercial, and residential projects are not expected to generate substantial quantities of hazardous waste. Therefore, no significant cumulative impacts on hazardous waste facilities are expected.

Solid Waste: Non-hazardous solid wastes are usually generated in offices, commercial buildings, and residential units. The estimates of solid waste generated by cumulative projects are about one million tons per year. Because the proposed project's contribution to solid and hazardous waste impacts is not cumulatively considerable, the cumulative impacts on solid/hazardous waste are not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

1.10.6.2 Mitigation Measures

No mitigation measures are required for the Chevron PRO Project because the impacts are less than significant. Chevron will continue to implement a source reduction and recycling program to minimize solid wastes generated at the Refinery. New development must comply with all applicable city, county, and state requirements regulating solid waste disposal. Cumulative impact mitigation is the responsibility of local regional and

state agencies and feasible mitigation measures are expected to be limited to source reduction and recycling measures.

1.10.6.3 Level of Significance After Mitigation

Individual project impacts on hazardous and solid waste from the Chevron PRO Project are less than significant and, therefore, not cumulatively considerable. Cumulative impacts on hazardous waste landfill facilities are expected to be less than significant because the industrial projects are expected to generate hazardous waste that can be recycled. Because the proposed project's contribution to solid and hazardous waste impacts is not cumulatively considerable, the cumulative impacts on solid/hazardous waste are not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

1.10.7 TRANSPORTATION/TRAFFIC

The potential significant adverse traffic impacts are expected to occur during the construction phase due to the temporary increase in construction workers at the Refinery. Following completion of construction, the increase in permanent workers is expected to be about 12 employees; therefore, the proposed project impacts on traffic during the operational phase are less than significant. Therefore the project's contribution to transportation and traffic impacts during project operation is not cumulative considerable and thus not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

1.10.7.1 Environmental Impacts from Construction

Traffic impacts associated with the construction of the Chevron proposed project are expected to be potentially significant during the evening peak hour at one intersection, Aviation Boulevard/El Segundo Boulevard and on portions of the I-105 and I-405 Freeways. Therefore, the proposed project may have cumulative traffic impacts with other projects in the area. The proposed project's contribution to cumulative impacts on traffic during the construction phase would be considered cumulatively considerable.

There could be cumulative construction traffic impacts associated with other industrial construction projects in the area that do not avoid peak traffic hours. However, the Chevron PRO Project is expected to provide the major portion of the traffic related to construction activities so cumulative construction impacts on traffic from these projects are considered significant.

1.10.7.2 Environmental Impacts from Operations

The cumulative traffic analysis for operations assumed that the ambient traffic growth rate in the city is 0.50 percent per year from year 2008 to year 2020 and no changes in existing intersection geometrics. On a cumulative basis, general growth in the area may result in significant traffic impacts at the intersections of: (1) Sepulveda Boulevard

(SR1) and El Segundo Boulevard; (2) Sepulveda (SR1) Boulevard and Rosecrans Avenue; (3) Aviation Boulevard and El Segundo Boulevard; and (4) Aviation Boulevard and Rosecrans Avenue.

The increase in traffic is unrelated to the proposed project but is related to general population growth in the area so mitigation measures will need to be developed as new projects that generate traffic are proposed and as part of the City of El Segundo's and Manhattan Beach's General Plan process.

1.10.7.3 Mitigation Measures

Chevron will encourage ride-sharing by construction workers to minimize construction impacts. In addition, different parking areas will be used with construction workers being bussed onto the Refinery so that traffic impacts will be spread throughout the area.

1.10.7.4 Level of Significance After Mitigation

The proposed project is expected to result in significant traffic impacts during the construction phase. However, the construction activities are expected to cease following completion of the proposed project so no long term significant traffic impacts are expected. Because the proposed project's contribution to transportation and traffic impacts during operation is not cumulatively considerable, the cumulative impacts on transportation and traffic are not significant because the environmental conditions would essentially be the same whether or not the proposed project is implemented (CEQA Guidelines §15130).

1.11 EXECUTIVE SUMMARY – CHAPTER 6: SUMMARY OF ALTERNATIVES

This EIR identifies and compares the relative merits of a range of reasonable alternatives to the proposed project as required by the CEQA guidelines. According to the CEQA Guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project and provide a means for evaluating the comparative merits of each alternative. In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines, §15126.6(a)). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation.

1.11.1 Description of Alternatives

Alternatives to the proposed project included Alternative 1 - No Project Alternative; Alternative 2 – No Additional Sulfur Recovery Facilities; Alternative 3 – Eliminate Vapor Recovery and Safety Flare System; Alternative 4 - Eliminate FCCU and Alkylation Unit Modifications; and Alternative 5 - Purchase Additional Electricity.

CEQA Guidelines §15126.6 (e) requires evaluation of a “No Project Alternative” which is Alternative 1 in Chapter 6. Under the “No Project Alternative,” no Refinery modifications would occur. The proposed modifications to the No. 2 Crude Unit, No. 2 RSU, Minalk/Merox Unit, FCCU, Alkylation Unit, VRDS, ISOMAX Unit, Cogen Train D, Railcar Loading/Unloading Rack, and utility improvements would not occur. In addition, the proposed new SRU, SWS, TGU, vapor recovery and safety flare system, storage tanks, cooling tower, and hydrogen compression and transfer facilities would not be built and the Refinery would continue to operate under its current configuration.

Under Alternative 2, the Sulfur Recovery facilities, including the SWS, SRU, and TGU, would not be constructed. All other portions of the proposed project would still be constructed including the proposed modifications to the No. 2 Crude Unit, No. 2 RSU, Minalk/Merox Unit, FCCU, Alkylation Unit, VRDS, ISOMAX Unit, Cogen Train D, Railcar Loading/Unloading Rack, and utility improvements. In addition, the proposed vapor recovery and safety flare system, storage tanks, cooling tower, and hydrogen compression and transfer facilities would be built.

Under Alternative 3, the project as described in Chapter 2 would be constructed with the exception of the Vapor Recovery and Safety Flare System. This is a voluntary Refinery modification that is proposed to eliminate the potential for venting of PRDs to the atmosphere, thus minimizing VOC emissions at the Refinery.

Under Alternative 4, the modifications to the FCCU and Alkylation Unit would not occur and the related increase in the recovery of additional LPG from the fuel gas system will not occur. All other portions of the proposed project would still occur.

Under Alternative 5, the new Cogen Unit would not be constructed meaning the required additional electricity demand would be supplied by the local utility company. Under Alternative 5, a new auxiliary boiler or an increase in fired heat duty of an existing boiler would be required to supply the necessary stream demand of the proposed new and modified units. All other portions of the project would still occur.

1.11.2 Environmental Impacts of Alternatives

Based on the analyses in Chapter 6, no feasible alternatives were identified that would reduce or eliminate the potentially significant air quality or traffic impacts during construction activities related to the proposed project and achieve the objectives of the proposed project.

The No Project Alternative (Alternative 1) would prevent Chevron from achieving all of the project objectives. However, the No Project Alternative would eliminate the potentially significant impacts related to air quality and traffic impacts during construction activities, making it an environmentally superior alternative .

Alternative 2 would result in significant impacts to air quality and traffic during construction, but would reduce the emissions and related traffic since the Sulfur

Recovery facilities would not be built. Therefore, in addition to the No Project Alternative, Alternative 2 would be considered the environmentally superior alternative as it would reduce project environmental impacts as compared to the proposed project, but would not reduce potentially significant impacts to less than significant. However, Alternative 2 would not allow the Refinery to meet all the project objectives of: (1) producing low-sulfur fuel products and increase production of commercial grade elemental sulfur; and (2) allowing the Refinery to efficiently and reliably process a wider range of crude oils, including higher sulfur-containing crude oils.

Alternative 3 and 4 would have similar impacts on air quality, energy, hazards/hazardous materials, noise and traffic, as the proposed project. Alternatives 3 and 4 would result in significant impacts to air quality and traffic during construction, but would reduce the construction and operational emissions and related traffic since fewer units would be built. Alternative 3 would not allow the Refinery to control the potential atmospheric releases and related emissions from PRDs in specified units. Alternative 4 would not include the energy efficiency modifications proposed for the FCCU and Alkylation Unit. Alternatives 3 and 4 would reduce project construction-related air quality and traffic impacts, but would not reduce potentially significant impacts to less than significant.

Alternative 5 would reduce project construction-related air quality and traffic impacts, but would not reduce potentially significant impacts to less than significant. Alternative 5 could result in significant impacts on energy because the Cogen Train D would not be constructed. Greenhouse gas emissions would be greater under Alternative 5. Therefore, the proposed project is preferred because it would attain all project objectives.

1.12 EXECUTIVE SUMMARY – CHAPTER 7 AND 8: REFERENCES, ACRONYMS AND GLOSSARY

Information on references cited (including organizations and persons consulted) and the acronyms and glossary are presented in Chapters 7 and 8, respectively.

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
<p>Air Quality</p> <p>The construction emissions for CO, VOC, NOx, PM10, and PM2.5 will exceed the SCAQMD CEQA significance thresholds and are significant.</p>	<p>Develop a Construction Emission Management Plan for the proposed project; prohibiting truck idling in excess of five minutes, use electricity or alternate fuels for on-site equipment, where feasible, maintain construction equipment tuned up, use electric welders and electric generators where electricity is available; retrofit cranes of 200 hp or greater with diesel particulate filters; suspend construction activities during first stage smog alerts; develop a fugitive dust emission control plan.</p> <p>None required.</p>	<p>Construction emissions are expected to remain significant for CO, VOC, NOx, PM10 and PM2.5.</p>
<p>The construction emissions of SOx will not exceed SCAQMD CEQA significant thresholds and are less than significant.</p>	<p>None required.</p>	<p>Construction emissions are expected to be less than significant for SOx.</p>
<p>Construction impacts for NO₂, CO, PM10 and PM2.5 would not exceed applicable local significance thresholds.</p>	<p>None required.</p>	<p>Concentrations of NO₂, CO, PM10 and PM2.5 are less than significant.</p>
<p>Traffic impacts from the proposed project are not expected to cause CO hotspots and no significant adverse impact on ambient air quality is expected.</p>	<p>None required.</p>	<p>Concentration of CO from traffic is less than significant.</p>
<p>Operational emissions of CO, NOx, SOx, PM10 and PM2.5 are less than significant.</p>	<p>None required. Project emissions are controlled through use of BACT.</p>	<p>Mass daily emissions of CO, NOx, SOx, PM10 and PM2.5 from stationary and fugitive sources are expected to be less than significant.</p>
<p>Operational emissions of criteria pollutants are significant for VOC.</p>	<p>VOC emissions from stationary sources will be offset.</p>	<p>The VOC offsets will reduce the proposed project to less than significant.</p>

TABLE 1-1 (continued)

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
<p>Air Quality (continued) Ambient air quality modeling indicates that the project emissions on NO₂, CO, PM10, and PM2.5 will be below ambient air quality standards and are less than significant.</p>	<p>None required.</p>	<p>Project emissions of NO₂, CO, PM10, and PM2.5 will be below ambient air quality standards and are less than significant.</p>
<p>The cancer risk due to the operation of the proposed project is expected to be less than the significance criterion of 10 per million, so that project impacts are less than significant.</p>	<p>None required.</p>	<p>Cancer risk impacts are less than significant.</p>
<p>The proposed project's impacts associated with exposure to non-carcinogenic compounds are expected to be less than significant. The chronic hazard index and the acute hazard index are both below 1.0.</p>	<p>None required.</p>	<p>No significant non-carcinogenic health impacts are expected.</p>
<p>Energy No significant energy resource impacts are expected from the construction or operation of the proposed project, as the project includes Cogen Train D which will provide additional electricity to the Refinery.</p>	<p>None required.</p>	<p>Energy resources impacts are less than significant.</p>
<p>Hazards and Hazardous Materials None of the new or modified units will create a hazard that could extend further off-site so no significant adverse hazards and hazardous material impacts are expected from the construction or operation of the proposed project.</p>	<p>None required.</p>	<p>Hazards and hazardous material impacts are less than significant.</p>

TABLE 1-1 (continued)

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
<p>Hydrology and Water Quality The increase in water demand associated with the project will be provided through the use of reclaimed water so no significant adverse impacts on water demand are expected.</p>	None required.	Water demand impacts are less than significant.
<p>The increase wastewater generated by the proposed project is within the capacity of the wastewater treatment plant and the facility's NPDES permit.</p>	None required.	Wastewater impacts are less than significant.
<p>Noise Construction noise increases are expected to be less than 1.2 decibels and less than significant.</p>	None required.	Construction noise impacts are less than significant.
<p>Operational noise increases are expected to be less than 1.3 decibel so no audible change in noise levels is expected and noise impacts are less than significant.</p>	None required.	Operational noise impacts are less than significant.
<p>Solid and Hazardous Waste No significant adverse solid and hazardous waste impacts are expected from the construction or operational phases of the proposed project.</p>	None required.	Solid and hazardous waste impacts are less than significant.
<p>Transportation and Traffic The demand for parking facilities due to construction workers will exceed the spaces available at the Refinery.</p>	The proposed project includes the use of satellite parking lots and transporting workers to the Refinery via bus.	Parking impacts during construction are less than significant.

TABLE 1-1 (concluded)
Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
<p>Transportation and Traffic (continued)</p> <p>During the peak construction period, evening peak traffic at the intersection of Aviation Boulevard/El Segundo Boulevard is expected to change the LOS from E to F, creating a significant traffic impact. The construction work shift is schedule to begin at 6:30 a.m. which will avoid the morning peak traffic period.</p>	<p>Ridesharing of construction will be encouraged but cannot be guaranteed.</p>	<p>Construction traffic impacts during the evening peak hour are expected to remain significant.</p>
<p>During the peak construction period, two freeway segments will be impacted during the evening peak hour, including the southbound lanes of I-405 between Rosecrans Ave. and El Segundo Blvd. and the northbound lanes of I-405 between El Segundo Blvd. and the I-105 interchange.</p>	<p>Ridesharing of construction will be encouraged but cannot be guaranteed.</p>	<p>Construction traffic impacts during the evening peak hour are expected to remain significant.</p>
<p>The proposed project is expected to generate an additional 24 trips per day during the operational phase and a reduction of truck trips of about 2 per day. No significant adverse traffic impacts are expected.</p>	<p>None required.</p>	<p>Transportation and traffic impacts associated with operation of the proposed project are less than significant.</p>

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APPENDIX B

EMISSIONS CALCULATIONS

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Appendix B
2Crude Closed Relief System Project
Chevron EI Segundo Refinery
Construction Emission Summary

Emissions from Equipment	2013												2014												2015											
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
CO (lb/day)	30.09	32.62	57.69	0.00	0.00	0.00	20.33	19.71	0.00	17.99	17.99	61.00	0.00	7.37	14.13	0.00	20.53	20.53	19.02	20.95	20.95	21.45	25.30	28.10	30.95	30.95	17.76	17.26	17.26	0.00	0.00	0.00	0.00	0.00	0.00	
NOx (lb/day)	41.16	45.02	73.93	0.00	0.00	0.00	33.25	27.82	0.00	27.37	27.37	75.12	0.00	11.06	17.59	0.00	30.36	30.36	28.56	31.48	31.48	27.39	33.85	35.47	39.32	39.32	22.88	21.79	21.79	0.00	0.00	0.00	0.00	0.00	0.00	
VOC (lb/day)	7.97	8.62	16.13	0.00	0.00	0.00	4.76	4.65	0.00	4.32	4.32	15.62	0.00	1.77	3.23	0.00	4.56	4.56	4.29	4.73	4.73	5.05	6.10	6.11	6.75	6.75	3.89	3.91	3.91	0.00	0.00	0.00	0.00	0.00	0.00	
SOx (lb/day)	0.05	0.05	0.09	0.00	0.00	0.00	0.05	0.03	0.00	0.03	0.03	0.10	0.00	0.02	0.02	0.00	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.05	0.05	0.05	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	
PM10 (lb/day)	3.51	3.85	6.33	0.00	0.00	0.00	1.90	2.04	0.00	2.29	2.29	5.96	0.00	0.56	1.27	0.00	1.89	1.89	1.74	1.96	1.96	2.10	2.73	2.76	3.09	3.09	1.80	1.72	1.72	0.00	0.00	0.00	0.00	0.00	0.00	
PM2.5 (lb/day) ⁽¹⁾	3.23	3.54	5.83	0.00	0.00	0.00	1.75	1.87	0.00	2.10	2.10	5.48	0.00	0.52	1.16	0.00	1.74	1.74	1.60	1.80	1.80	1.93	2.51	2.54	2.84	2.84	1.65	1.58	1.58	0.00	0.00	0.00	0.00	0.00	0.00	
CO ₂ (lb/day)	6122.78	4462.04	7473.34	0.00	0.00	0.00	4464.98	2972.15	0.00	2710.41	2710.41	10289.83	0.00	1468.82	2088.73	0.00	4417.30	4417.30	4198.21	4516.86	4516.86	3085.86	3610.07	6110.15	4497.55	4497.55	2603.66	2474.53	2474.53	0.00	0.00	0.00	0.00	0.00	0.00	

Emission from Trips	2013												2014												2015											
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
CO (lb/day)	4.81	4.81	4.81	0.00	0.00	0.00	0.00	0.00	0.00	4.81	4.81	4.48	0.00	0.00	0.00	0.00	7.92	9.06	8.48	11.11	14.02	9.98	9.21	11.58	9.59	9.53	9.53	6.66	4.23	0.00	0.00	0.00	0.00	0.00	0.00	
NOx (lb/day)	0.48	0.48	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.48	0.44	0.00	0.00	0.00	0.00	3.12	3.23	2.53	3.96	5.02	3.84	2.99	2.98	2.78	2.78	2.78	1.68	0.41	0.00	0.00	0.00	0.00	0.00	0.00	
VOC (lb/day)	0.51	0.51	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.51	0.48	0.00	0.00	0.00	0.00	0.94	1.06	0.97	1.31	1.65	1.19	1.07	1.33	1.12	1.11	1.11	0.77	0.46	0.00	0.00	0.00	0.00	0.00	0.00	
SOx (lb/day)	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
PM10 (lb/day)	0.32	0.32	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.32	0.32	0.00	0.00	0.00	0.00	0.88	0.97	0.84	2.06	2.38	1.98	1.82	2.05	1.89	1.89	1.89	1.55	0.33	0.00	0.00	0.00	0.00	0.00	0.00	
Exhaust PM (lb/day)	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.18	0.19	0.17	0.26	0.32	0.24	0.21	0.24	0.21	0.21	0.21	0.15	0.06	0.00	0.00	0.00	0.00	0.00	0.00	
Fugitive PM (lb/day)	0.26	0.26	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.26	0.26	0.00	0.00	0.00	0.00	0.71	0.77	0.67	1.81	2.06	1.74	1.61	1.81	1.68	1.68	1.68	1.40	0.27	0.00	0.00	0.00	0.00	0.00	0.00	
PM2.5 (lb/day) ⁽¹⁾	0.11	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.11	0.00	0.00	0.00	0.00	0.30	0.32	0.28	0.56	0.67	0.54	0.48	0.55	0.50	0.50	0.50	0.39	0.11	0.00	0.00	0.00	0.00	0.00	0.00	
Exhaust PM (lb/day)	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.18	0.19	0.17	0.26	0.32	0.24	0.21	0.24	0.21	0.21	0.21	0.15	0.06	0.00	0.00	0.00	0.00	0.00	0.00	
Fugitive PM (lb/day)	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.12	0.13	0.11	0.31	0.35	0.30	0.27	0.31	0.29	0.29	0.29	0.24	0.05	0.00	0.00	0.00	0.00	0.00	0.00	
CO ₂ (lb/day)	747.35	747.35	747.35	0.00	0.00	0.00	0.00	0.00	0.00	747.35	747.35	748.44	0.00	0.00	0.00	0.00	1442.37	1632.24	1503.26	2082.70	2608.38	1892.83	1724.81	2271.89	1914.46	1903.43	1903.43	1337.98	758.98	0.00	0.00	0.00	0.00	0.00	0.00	

Fugitive PM	2013												2014												2015												
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
PM10 (lb/day) ⁽²⁾							7.27																														
PM2.5 (lb/day) ⁽¹⁾⁽²⁾							4.22																														

Paint	2013												2014												2015												
	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
VOC (lb/day)																																					

Total Emissions	Thresholds	2013												2014												2015											
		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
CO (lb/day)	550	34.90	37.43	62.50	0.00	0.00	20.33	19.71	0.00	22.80	22.80	65.47	0.00	7.37	14.13	0.00	28.45	29.59	27.50	32.06	34.97	31.43	34.51	39.68	40.54	40.48	27.29	23.92	21.49	0.00	0.00	0.00	0.00	0.00	0.00		
NOx (lb/day)	100	41.65	45.50	74.42	0.00	0.00	33.25	27.82	0.00	27.85	27.85	75.57	0.00	11.06	17.59	0.00	33.48	33.59	31.09	35.44	36.51	31.23	36.84	38.44	42.11	42.10	25.66	23.46	22.20	0.00	0.00	0.00	0.00	0.00	0.00		
VOC (lb/day)	75	8.48	9.12	16.64	0.00	0.00	4.76	4.65	0.00	4.82	4.82	16.10	0.00	1.77	3.23	0.00	5.50	5.62	5.26	6.04	6.38	6.24	7.18	7.44	7.86	7.86	5.00	4.67	4.36	0.00	0.00	0.00	0.00	0.00	0.00		
SOx (lb/day)	150	0.06	0.06	0.10	0.00	0.00	0.05	0.03	0.00	0.04	0.04	0.11	0.00	0.02	0.02	0.00	0.06	0.07	0.06	0.07	0.08	0.05	0.06	0.07	0.07	0.07	0.05	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00		
PM10 (lb/day) ⁽²⁾	150	3.83	4.17	6.66	0.00	0.00	9.18	2.04	0.00	2.61	2.61	6.28	0.00	0.56	1.27	0.00	2.77	2.85	2.58	4.02	4.34	4.08	4.55	4.81	4.99	4.98	3.69	3.27	2.05	0.00	0.00	0.00	0.00	0.00	0.00		
PM2.5 (lb/day) ⁽¹⁾⁽²⁾	55	3.33	3.65	5.93	0.00	0.00	5.97	1.87	0.00	2.21	2.21	5.59	0.00	0.52	1.16	0.00	2.03	2.06	1.89	2.37	2.47	2.47	2.99	3.09	3.34	3.34	2.15	1.97	1.69	0.00	0.00	0.00	0.00	0.00	0.00		
CO ₂ (lb/day)	NA	6870.13	5209.38	8220.69	0.00	0.00	4464.98	2972.15	0.00	3457.76	3457.76	11038.27	0.00	1468.82	2088.73	0.00	5859.66	6049.54	5701.47	6599.56	7125.25	4978.69	5334.88	8382.04	6412.01	6400.98	4507.09	3812.51	3233.52	0.00	0.00	0.00	0.00	0.00	0.00		
CO ₂ (metric tons/year)	NA										353.66																									334.23	

(1) https://www.aqmd.gov/ceqa/handbook/PM2_5/pm2_5_ratio.xls
(2) Mitigated PM.

Appendix B
2Crude Closed Relief System Project
Chevron El Segundo Refinery
Construction Equipment Emission Factors

Equipment Type	HP	2013 Emission Factors lb/hr ⁽¹⁾								2014 Emission Factors lb/hr ⁽¹⁾								2015 Emission Factors lb/hr ⁽¹⁾							
		VOC	CO	NOx	SOx	PM10	CO2	CH4	CO2eq	VOC	CO	NOx	SOx	PM10	CO2	CH4	CO2eq	VOC	CO	NOx	SOx	PM10	CO2	CH4	CO2eq
Air Compressor	120	0.0825	0.3251	0.4991	0.0006	0.0456	47.0	0.0074	47.1065	0.0758	0.3216	0.4682	0.0006	0.0416	47.0	0.0068	47.0938	0.0691	0.3182	0.4334	0.0006	0.0375	47.0	0.0062	47.0811
Air Compressor	50	0.0921	0.2546	0.2221	0.0003	0.0220	22.3	0.0083	22.4457	0.0831	0.2446	0.2134	0.0003	0.0201	22.3	0.0075	22.4286	0.0747	0.2360	0.2056	0.0003	0.0183	22.3	0.0067	22.4129
Backhoe	175	0.0988	0.5861	0.7696	0.0011	0.0428	101	0.0089	101.5741	0.0924	0.5857	0.7161	0.0011	0.0380	101	0.0083	101.5620	0.0854	0.5853	0.6331	0.0011	0.0335	101	0.0077	101.5488
Cherry Picker	120	0.0558	0.2425	0.3758	0.0004	0.0299	38.1	0.0050	38.1775	0.0509	0.2400	0.3531	0.0004	0.0272	38.1	0.0046	38.1682	0.0460	0.2377	0.3272	0.0004	0.0246	38.1	0.0042	38.1590
Concrete Finisher	15	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011	10.1296	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011	10.1296	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011	10.1296
Concrete Pump	250	0.1266	0.4210	1.6140	0.0023	0.0457	201	0.0114	201.6092	0.1175	0.4096	1.4689	0.0023	0.0416	201	0.0106	201.5919	0.1088	0.3998	1.3270	0.0023	0.0376	201	0.0098	201.5755
Concrete Saw	15	0.0199	0.0678	0.1257	0.0002	0.0049	16.5	0.0018	16.5154	0.0199	0.0678	0.1256	0.0002	0.0048	16.5	0.0018	16.5154	0.0199	0.0678	0.1256	0.0002	0.0047	16.5	0.0018	16.5154
Crawler Crane	500	0.1551	0.5292	1.4230	0.0018	0.0518	180	0.0140	180.3951	0.1468	0.4948	1.2979	0.0018	0.0470	180	0.0132	180.3794	0.1393	0.4663	1.1812	0.0018	0.0426	180	0.0126	180.3652
Crawler Crane	250	0.1040	0.2948	0.9948	0.0013	0.0351	112	0.0094	112.3560	0.0979	0.2817	0.9088	0.0013	0.0317	112	0.0088	112.3444	0.0925	0.2713	0.8284	0.0013	0.0286	112	0.0083	112.3341
Crawler Crane	175	0.1031	0.4821	0.7769	0.0009	0.0445	80.3	0.0093	80.5400	0.0977	0.4806	0.7306	0.0009	0.0412	80.3	0.0088	80.5297	0.0919	0.4794	0.6684	0.0009	0.0378	80.3	0.0083	80.5187
Crawler Crane	120	0.0919	0.3618	0.5508	0.0006	0.0493	50.1	0.0083	50.3221	0.0859	0.3587	0.5189	0.0006	0.0453	50.1	0.0078	50.3107	0.0800	0.3559	0.4822	0.0006	0.0415	50.1	0.0072	50.2996
120T Hydro Crane	120	0.0919	0.3618	0.5508	0.0006	0.0493	50.1	0.0083	50.3221	0.0859	0.3587	0.5189	0.0006	0.0453	50.1	0.0078	50.3107	0.0800	0.3559	0.4822	0.0006	0.0415	50.1	0.0072	50.2996
Forklift	120	0.0438	0.2176	0.2788	0.0004	0.0241	31.2	0.0040	31.3079	0.0390	0.2158	0.2571	0.0004	0.0206	31.2	0.0035	31.2988	0.0345	0.2143	0.2326	0.0004	0.0174	31.2	0.0031	31.2903
Gas Engine Vibrator	15	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011	10.1296	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011	10.1296	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011	10.1296
Generator	120	0.1106	0.4905	0.7587	0.0009	0.0590	77.9	0.0100	78.1590	0.1008	0.4857	0.7130	0.0009	0.0537	77.9	0.0091	78.1404	0.0910	0.4811	0.6607	0.0009	0.0484	77.9	0.0082	78.1218
Grader	175	0.1467	0.7345	1.1193	0.0014	0.0631	124	0.0132	124.1995	0.1386	0.7331	1.0511	0.0014	0.0577	124	0.0125	124.1841	0.1299	0.7319	0.9534	0.0014	0.0526	124	0.0117	124.1676
Auger Driller	250	0.0795	0.3429	0.7632	0.0021	0.0221	188	0.0072	188.2525	0.0737	0.3426	0.6140	0.0021	0.0179	188	0.0066	188.2415	0.0681	0.3425	0.4900	0.0021	0.0144	188	0.0061	188.2309
Heavy Roller	120	0.0986	0.4063	0.6253	0.0007	0.0534	59.0	0.0089	59.1756	0.0921	0.4030	0.5906	0.0007	0.0494	59.0	0.0083	59.1633	0.0857	0.4000	0.5498	0.0007	0.0454	59.0	0.0077	59.1511
Lighting Center	50	0.1151	0.3456	0.3415	0.0005	0.0296	36.2	0.0104	36.4090	0.1035	0.3331	0.3273	0.0005	0.0269	36.2	0.0093	36.3869	0.0931	0.3227	0.3148	0.0005	0.0243	36.2	0.0084	36.3671
Pump - Catalyst Vacuum	25	0.0359	0.1004	0.1761	0.0002	0.0109	19.5	0.0032	19.5553	0.0333	0.0959	0.1721	0.0002	0.0101	19.5	0.0030	19.5504	0.0309	0.0919	0.1682	0.0002	0.0094	19.5	0.0028	19.5460
Pump - Diaphragm Sump	15	0.0125	0.0497	0.0752	0.0001	0.0049	7.4	0.0011	7.4474	0.0117	0.0488	0.0716	0.0001	0.0045	7.4	0.0011	7.4460	0.0111	0.0479	0.0683	0.0001	0.0041	7.4	0.0010	7.4447
Pump - Drum Sucker/Minute Man	15	0.0125	0.0497	0.0752	0.0001	0.0049	7.4	0.0011	7.4474	0.0117	0.0488	0.0716	0.0001	0.0045	7.4	0.0011	7.4460	0.0111	0.0479	0.0683	0.0001	0.0041	7.4	0.0010	7.4447
Pump - Dry Vacuum Unit	15	0.0125	0.0497	0.0752	0.0001	0.0049	7.4	0.0011	7.4474	0.0117	0.0488	0.0716	0.0001	0.0045	7.4	0.0011	7.4460	0.0111	0.0479	0.0683	0.0001	0.0041	7.4	0.0010	7.4447
Pump - Gully Sucker	15	0.0125	0.0497	0.0752	0.0001	0.0049	7.4	0.0011	7.4474	0.0117	0.0488	0.0716	0.0001	0.0045	7.4	0.0011	7.4460	0.0111	0.0479	0.0683	0.0001	0.0041	7.4	0.0010	7.4447
Pump - Hydrotest	50	0.1052	0.3116	0.3228	0.0004	0.0275	34.3	0.0095	34.5342	0.0949	0.3004	0.3098	0.0004	0.0251	34.3	0.0086	34.5147	0.0855	0.2910	0.2982	0.0004	0.0228	34.3	0.0077	34.4968
Pump - Hydrotest	25	0.0359	0.1004	0.1761	0.0002	0.0109	19.5	0.0032	19.5553	0.0333	0.0959	0.1721	0.0002	0.0101	19.5	0.0030	19.5504	0.0309	0.0919	0.1682	0.0002	0.0094	19.5	0.0028	19.5460
Pump - Trash	25	0.0359	0.1004	0.1761	0.0002	0.0109	19.5	0.0032	19.5553	0.0333	0.0959	0.1721	0.0002	0.0101	19.5	0.0030	19.5504	0.0309	0.0919	0.1682	0.0002	0.0094	19.5	0.0028	19.5460
Skip Loader	120	0.0694	0.3529	0.4565	0.0006	0.0383	51.7	0.0063	51.8596	0.0634	0.3503	0.4252	0.0006	0.0337	51.7	0.0057	51.8482	0.0577	0.3480	0.3870	0.0006	0.0293	51.7	0.0052	51.8373
Tamper - Plate Type - Gas	15	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	4.3233	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	4.3233	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	4.3233
Tamper - Single Butt	15	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	4.3233	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	4.3233	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	4.3233
Tractor	250	0.1204	0.3666	1.1658	0.0019	0.0370	172	0.0109	171.9651	0.1142	0.3608	1.0294	0.0019	0.0330	172	0.0103	171.9534	0.1082	0.3566	0.9047	0.0019	0.0294	172	0.0098	171.9421
Truck Crane	120	0.0919	0.3618	0.5508	0.0006	0.0493	50.1	0.0083	50.3221	0.0859	0.3587	0.5189	0.0006	0.0453	50.1	0.0078	50.3107	0.0800	0.3559	0.4822	0.0006	0.0415	50.1	0.0072	50.2996
Upright Jumper	15	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	4.3233	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	4.3233	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	4.3233
Welder	25	0.0208	0.0581	0.1020	0.0001	0.0063	11.3	0.0019	11.3255	0.0193	0.0555	0.0996	0.0001	0.0058	11.3	0.0017	11.3226	0.0179	0.0532	0.0974	0.0001	0.0054	11.3	0.0016	11.3200
Welder	50	0.0979	0.2753	0.2535	0.0003	0.0240	26.0	0.0088	26.1436	0.0886	0.2652	0.2435	0.0003	0.0219	26.0	0.0080	26.1260	0.0801	0.2564	0.2346	0.0003	0.0200	26.0	0.0072	26.1097

(1) SCAQMD, 2006 : http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls

(2) Modelled as 'Crane'.

Appendix B
2Crude Closed Relief System Project
Chevron El Segundo Refinery
Peak Monthly Fugitive PM Construction Emissions

	Average Pieces of Equipment Operating	Peak Pieces of Equipment Operating	Hours of Operation	PM10 Emission Factor (lb/hour)	Water Control Factor ⁽⁵⁾	Controlled Emissions		Uncontrolled Emissions		SCAQMD Emission Factor Source
						Average PM10 Emissions (lbs/day)	Peak PM10 Emissions (lbs/day)	Average PM10 Emissions (lbs/day)	Peak PM10 Emissions (lbs/day)	
Grading Operations	2	2	10	0.348	0.39	2.71	2.71	6.95273043	6.95273043	Table A9-9-F
Construction Activities ⁽¹⁾										

	Average Tons of Materials Handled Per Day	Peak Tons of Materials Handled Per Day	PM10 Emission Factor (lb/ton)	Water Control Factor ⁽⁵⁾	Controlled Emissions		Uncontrolled Emissions		SCAQMD Emission Factor Source
					Average PM10 Emissions Pounds/day	Peak PM10 Emissions Pounds/day	Average PM10 Emissions Pounds/day	Peak PM10 Emissions Pounds/day	
Stockpiles	375	375	0.00005	0.39	0.00753679	0.00753679	0.01932509	0.01932509	Table A9-9-G

Assumptions: 1 cubic yard trench spoils = 1 ton

	Days of Construction	Average Acreage Disturbed Per Day	Peak Acreage Disturbed Per Day	PM10 Emission Factor (lb/day/acre)	Controlled Emissions		Uncontrolled Emissions		SCAQMD Emission Factor Source
					Average PM10 Emissions Pounds/day	Peak PM10 Emissions Pounds/day	Average PM10 Emissions Pounds/day	Peak PM10 Emissions Pounds/day	
WIND EROSION Disturbed Area and Temporary Stockpiles	20	0.02	0.02	0.120	0.002	0.002	0.000	0.000	Table A9-9-E

	Estimated Materials Handled Per Day (tons)	Peak Materials Handled Per Day (tons)	PM10 Emission Factor (lb/ton)	Water Control Factor ⁽⁵⁾	Controlled Emissions		Uncontrolled Emissions		SCAQMD Emission Factor Source
					Average PM10 Emissions Pounds/day	Peak PM10 Emissions Pounds/day	Average PM10 Emissions Pounds/day	Peak PM10 Emissions Pounds/day	
Filling and Dumping	375.0	375.0	0.02205	0.39	3.2248125	3.2248125	8.26875	8.26875	Table A9-9
Truck Filling ⁽⁴⁾	375.0	375.0	0.009075	0.39	1.32721875	1.32721875	3.403125	3.403125	Table A9-9
Truck Dumping									

TOTAL PM10 Pounds/day	Average	Peak
(Controlled Emissions)	7.2735	7.27353
(Uncontrolled Emissions)	18.644	18.644

- Emissions (lbs/hr) = $[0.75 \times (G^{1.5}) / (H^{1.4})] \times J$
 where G = silt content (7.5%), H = moisture content (15.0%) and J = hrs of operation (EPA AP-42 Table 11.9-1 for bulldozing overburden).
- Emissions (lbs/ton) = $0.00112 \times [(G/6)^{1.3} / (H/2)^{1.4}] \times I / J$
 where G=mean wind speed (4.1 mph), H=moisture content of surface material (15%), I=lbs of dirt handled per day; and J=2,000 lbs/ton. Wind speed data acquired from Long Beach 2005-2007 SCAQMD meteorological file.
- Emissions (lbs/day/acre) = $1.7 \times [(G/1.5)^{1.3} / (235)^{1.4}] \times I \times J$
 where G = silt content (7.5%); H = days with >0.01 inch of rain (34); I = percentage of time wind speed exceeds 12 mph (0.3%) and J= fraction of TSP (0.5). Wind speed data acquired from Long Beach 2005-2007 SCAQMD meteorological file.
- Used SCAQMD Table 9-9 Default emission factors.
- Mitigated Emissions assume that watering 3 times per day controls emissions by 61 percent (Uncontrolled Emissions x 0.39). www.AQMD.gov/CEQA/handbook/mitigation/fugitive/Table XI-A.doc