CHAPTER 1

INTRODUCTION AND EXECUTIVE SUMMARY

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

Chevron Products Company (Chevron) is proposing to modify the El Segundo Refinery. This ~~Draft~~ Final Environmental Impact Report (EIR) has been prepared to assess the impacts of the proposed project on the environment as required under the California Environmental Quality Act (CEQA).

1.1 Introduction

Chevron's proposed project was developed to enable the refinery to maintain or slightly increase its current production levels of saleable products while processing more heavy crude oil and less light crude oil than it currently processes. Maintaining current production levels of saleable products while processing more heavy crude oil will require an annual increase of approximately five percent in the total amount of crude oil processed by the refinery. The proposed project will also reduce sulfur dioxide (SO_2) emissions from refinery fuel gas combustion.

1.1.1 Project Need

The refinery processes crude oil to produce motor fuels and other saleable petroleum products. The refinery processes both heavy and light crude oils. Heavy crude oils are more dense and viscous than light crude oils and generally produce smaller amounts of motor fuels per barrel than light crude oils. Because most new crude oil discoveries in the world are heavier than historic crude oil supplies, Chevron is proposing modifications to the refinery to maintain or slightly increase its current production levels of saleable petroleum products by being able to process more heavy crude oil and less light crude oil than it currently processes.

1.1.2 Purpose and Authority

CEQA requires the environmental impacts of proposed projects to be evaluated and feasible methods to reduce, avoid, or eliminate identified significant adverse impacts of these projects to be considered. To fulfill the purpose and intent of CEQA, the South Coast Air Quality Management District (SCAQMD), as the CEQA lead agency, directed the preparation of the ~~Draft~~ Final EIR, which addresses the potential environmental impacts associated with the Chevron Products Company - El Segundo Refinery Heavy Crude Project.

Lead Agency means "the public agency which has the principal responsibility for carrying out or approving a project which may have a significant effect upon the environment" (Public Resources Code, §21067). For this project, the SCAQMD and the City of El Segundo, where the refinery is located, evaluated the lead agency determination. Because the SCAQMD has primary discretionary approval authority over the proposed project, it was determined that the SCAQMD would be the appropriate lead agency.

While the SCAQMD is the lead agency, the CEQA Guidelines, §§15082 and 15103, require responsible agencies, trustee agencies, and the public to be notified of the intent and scope of the

proposed project. Consistent with the above CEQA Guidelines sections, a Notice of Preparation (NOP) and Initial Study (IS) were prepared and distributed to the identified responsible agencies and parties for a 30-day review and comment period from September 29, 2005 to October 28, 2005. The NOP/IS and comments received, and responses to these comments are included in Appendix A to this ~~Draft~~ Final EIR.

1.2 Scope of EIR and Format

The scope of this ~~Draft~~ Final EIR meets the requirements identified under CEQA and includes a description of the proposed project in Chapter 2. The existing environmental setting is discussed in Chapter 3. The potential adverse impacts associated with the proposed project are analyzed and presented in Chapter 4. Chapter 4 also includes mitigation measures identified to reduce or lessen potential significant adverse impacts of the proposed project. CEQA requires that both alternatives to the proposed project and cumulative impacts be analyzed in an EIR. These areas are presented in Chapters 5 and 6, respectively. The organizations and persons consulted and references used in the preparation of this document are provided in Chapters 7 and 8, respectively. Supporting documentation to the impact analysis is provided as technical appendices to this ~~Draft~~ Final EIR as recommended by CEQA Guidelines §15147.

In the IS, 11 environmental areas were determined not to be significant: Aesthetics, Agricultural Resources, Biological Resources, Cultural Resources, Energy, Geology and Soils, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, and Recreation. Therefore, these subject areas are not further analyzed in this ~~Draft~~ Final EIR.

The CEQA Guidelines §15123(b)(2) requires the identification of areas of controversy in the EIR summary section. There are no known areas of controversy at this time.

1.3 Chapter 2 Summary - Project Description

To process more heavy crude oil, the refinery operators are proposing modifications to the No. 4 Crude Distillation Unit and the Delayed Coking Unit (Coker). Chevron is also proposing modifications to the No. 6 H_2S Plant to improve the removal of sulfur compounds from refinery fuel gas to assist the refinery in complying with SCAQMD Regulation XX - Regional Clean Air Incentives Market (RECLAIM) and to increase the reliability of the removal process.

The No. 4 Crude Unit performs the initial steps in refining most of the crude oil processed by the refinery. The No. 4 Crude Unit includes both an atmospheric distillation column and a vacuum distillation column. The atmospheric distillation column performs an initial separation of the crude oil at atmospheric pressure into several components, including methane, ethane, liquid petroleum gas (LPG), naphtha, raw jet fuel, raw diesel fuel, gas oil and atmospheric residuum. These components are processed by other process units in the refinery. The atmospheric residuum is sent from the atmospheric distillation column to the vacuum distillation column for separation into light gas oil, heavy gas oil and vacuum residuum.

Processing more heavy crude oil will change the relative amounts of various products produced by the No. 4 Crude Unit. In particular, the quantity of vacuum residuum produced from each barrel of crude oil will increase, and the No. 4 Crude Unit cannot handle the increase. Therefore, Chevron is proposing modifications to the No. 4 Crude Unit that will enable it to handle the increased vacuum residuum production. The design changes required to handle the increased vacuum residuum production will result in an overall increase in the crude-oil processing capacity of the No. 4 Crude Unit of approximately five percent, while resulting in a reduction in the amount of light crude oil processed.

Proposed modifications to the No. 4 Crude Unit include modifying internal components of the atmospheric and vacuum distillation columns to improve distillation efficiency; replacing steam ejectors on the vacuum distillation column to increase column production capacity; modifying and adding new heat exchangers to increase heat recovery and reduce pressure drop; modifying pumps to handle higher viscosity material; replacing piping with larger diameter pipes to reduce pressure drop; and installing additional automated controls for existing equipment to improve emergency response and normal operating efficiency.

The Coker processes the vacuum residuum produced by the crude units. The vacuum residuum is heated and fed into vessels called coke drums. It remains inside the coke drums under pressure for approximately 12 hours, where it cracks into lighter materials. These light materials boil off in the coke drums, leaving behind a solid coal-like material called petroleum coke. The light materials are separated intro raw gasoline, raw jet fuel, raw diesel fuel, and gas oil in the Coker Main Fractionator column, and are processed further by other process units in the refinery. After the cracking process is completed, the coke drum is stripped with steam, cooled with water, opened, and the coke is "drilled" out of the drum with a high-pressure water system. The entire cycle drum for a batch of coke in a coke drum is 15 hours. The petroleum coke is reduced in size by a primary crusher. Belt conveyors transport the crushed petroleum coke from the primary crusher to a secondary crusher, which discharges into truck loading hoppers. The loaded trucks transport the petroleum coke to the Port of Los Angeles. The petroleum coke is exported from the Port of Los Angeles for use in heating and manufacturing operations by third parties at various locations within or outside California.

The current annual average vacuum residuum feed capacity of the Coker is 60 MBPOD. Chevron is proposing modifications to increase the annual average capacity of the Coker to 75 ~~to 80~~ MBPOD to accommodate the increase in vacuum residuum production by the crude units when they process more heavy crude oil. Petroleum coke production will increase by 510 tons per day, from an annual average of 3,950 tons per day to 4,460 tons per day. Approximately 20 additional truck trips per day will be required to export the increased quantities of petroleum coke from the refinery. The production of light products by the Coker will also increase.

Proposed modifications to the Coker include the installation of new heat exchangers to increase heat transfer; installation of a new cooling water supply and return system from Cooling Tower No.

9 to the Coker to increase coke-drum cooling capacity; replacement of an existing depropanizer with a larger depropanizer to increase propane removal capacity; replacement of the Coker Main Fractionator column with a larger column to increase light-product separation capacity; installation of new pumps and upgrades to existing pumps to increase pumping capacity, upgrades to the gas compression equipment at the Coker to increase capacity, modifications to the coke drums and coke drilling systems to reduce the cycle time from 15 hours to 12 hours; and installation of additional automated controls for existing equipment to improve emergency response and normal operating efficiency. Subsequent to release of the Draft EIR for public review and comment, it was determined that an emission control device for emissions during coke drum depressurization needs to be installed to comply with the requirement to apply Best Available Control Technology (BACT) in SCAQMD Rule 1303. Therefore, Chevron is also proposing to install a control device to reduce emissions when the coke drums are depressurized before they are opened.

The current capacity of the petroleum coke conveying system is adequate to accommodate the proposed increase in petroleum coke production, and Chevron is not proposing to increase the conveying system's capacity. Chevron is, however, proposing to modify portions of the petroleum coke conveying system to allow more efficient handling of the petroleum coke and to reduce particulate matter emissions during petroleum coke transport and export truck loading operations.

The No. 6 H_2S Plant treats the sulfur-containing gases (called sour gases) from the Coker overhead gas compressor, the Coker waste compressor, the Low Pressure Distillation gas recovery compressor, the flare gas recovery Houdry Compressors and overhead gas from a Depropanizer to remove sulfur compounds. The No. 6 H_2S plant includes a Stacked Absorber column, which consists of a diethanolamine (DEA) absorber section at the bottom of the column and a water wash section at the top of the column. The DEA absorber section removes most of the hydrogen sulfide (H_2S) in the sour gas by dissolving it in DEA, and the water wash section prevents DEA carryover in the gases leaving the column. The gas from the Stacked Absorber is further processed in the Merox section of No. 6 H_2S Plant to remove mercaptans. The treated fuel gas (called sweet fuel gas) is then routed to an existing fuel gas mix drum.

The H_2S-containing DEA (called rich DEA) that leaves the DEA absorber section in the Stacked Absorber column is processed by the No. 5 H_2S Plant to remove the H_2S. The resulting lean DEA is returned to the No. 6 H_2S plant for reuse. Currently, the No. 6 H_2S Plant must be shut down when the No. 5 H_2S Plant is out of service, either for planned maintenance or when operational problems occur, because rich DEA from the No. 6 H_2S Plant cannot be regenerated. The process units that produce the sour gas that is treated by the No. 6 H_2S Plant must also be shut down when the No. 6 H_2S Plant is shut down, in order to avoid combustion of untreated fuel gas with high sulfur concentrations. Thus, shutdown of the No. 5 H_2S Plant requires shutdown of refinery process units serviced by the No. 6 H_2S Plant in addition to the units serviced by the No. 5 H_2S Plant.

Chevron is proposing to install a new DEA Regenerator in the No. 6 H_2S Plant, which will regenerate the rich DEA from the No. 6 H_2S Plant and eliminate the need to send the rich DEA to the No. 5 H_2S Plant for regeneration. The H_2S produced by the regenerator will be processed by the refinery's Sulfur Recovery Units to remove the H_2S and convert it to elemental sulfur, which is subsequently exported from the refinery for sale. Chevron is also proposing to install a new Relief Caustic Scrubber in the No. 6 H_2S Plant to remove H_2S from the acid gas produced by the proposed new DEA regenerator in case of an emergency that would prevent the Sulfur Recovery Units from processing the acid gas. Chevron is also proposing to install a new Jet Wash Column to absorb any remaining COS from the process gas stream leaving the Merox section of the No. 6 H_2S Plant. The proposed Jet Wash column will use circulating jet or diesel fuel to absorb COS from the gas stream.

The overall construction period for the proposed project is expected to last a total of ~~19~~22 months, beginning in June 2006 and ending in ~~December 2007~~March 2008. Peak overall construction employment is anticipated to be 694 workers during October 2007, and average construction employment over the entire ~~19~~22-month construction period is estimated at about ~~275~~242 workers.

During most of the construction period, construction will take place 10 hours per day, from 6:30 a.m. to 5:00 p.m., five days per week, Monday through Friday. Turnarounds, which are times when refinery equipment is removed from service for maintenance activities, are scheduled for the No. 4 Crude Unit from late-March 2007 through early-May 2007 and for the Coker from mid-September 2007 through November 2007. A substantial amount of the construction for the proposed modifications to the No. 4 Crude Unit and the Coker, such as replacement of internal components, can only take place during these turnarounds when the units are out of service. Therefore, to minimize the amount of time that the units are out of service, construction during the turnarounds will take place in two 10-hour shifts, from 6:30 a.m. to 5:00 p.m. and from 6:30 p.m. to 5:00 a.m., six days per week, Monday through Saturday.

Chevron will arrange for parking for construction workers at an off-site location (the parking lot of Dockweiler Beach State Park) on Vista Del Mar, northwest of the refinery. Shuttle buses will be used to transport the construction workers between the parking facility and the refinery. Chevron will specify in construction contracts that construction workers access the parking facility by traveling on the Interstate 105 (I-105) freeway and West Imperial Highway, which are on the northern boundary of the City of El Segundo, and Vista Del Mar, which is on the western boundary of El Segundo. This route which will avoid construction worker travel on heavily congested surface streets.

No additional employees will be required on-site to operate any new equipment as a result of implementing the proposed project. The increase in petroleum coke production from the proposed project will require 20 additional truck trips per day from the refinery to the Port of Los

Angeles or Long Beach, and the increase in sulfur production will require an average of ~~two~~one additional truck trips per day from the refinery to the vicinity of the Port of Los Angeles.

1.4 Chapter 3 Summary - Setting

CEQA Guidelines §15125 requires that an EIR include a description of the environment within the vicinity of the proposed project as it exists at the time the NOP is published, or if no NOP is published, at the time the environmental analyses commence, from both a local and regional perspective. Chapter 3 - Setting describes the existing environment around the refinery that could be adversely affected by the proposed project for the potentially significant environmental topics identified in the IS, which include Air Quality, Hazards and Hazardous Materials, Hydrology and Water Quality, Noise, Solid and Hazardous Wastes, and Transportation and Traffic.

1.4.1 Air Quality

The determination of whether a region's air quality is healthful or unhealthful is determined by comparing contaminant levels in ambient air samples to national and state standards, which are set by the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) at levels to protect public heath and welfare with an adequate margin of safety NAAQS and CAAQS have been established for the following criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns in diameter (PM10), particulate matter less than 2.5 microns in diameter (PM2.5), sulfur dioxide (SO_2), and lead. The CAAQS are more stringent than the federal standards. California has also established standards for sulfate, visibility reducing particles, hydrogen sulfide (H_2S), and vinyl chloride. However, H_2S and vinyl chloride are currently not monitored in the SCAQMD's jurisdiction because these contaminants are not seen as a significant air quality problem.

Chapter 3 provides a description of existing air quality for each criteria pollutant and for toxic air contaminants. State O_3 air quality standards were exceeded at the SCAQMD air quality monitoring station closest to the refinery on three days during 2001-2004, and state PM10 air quality standards were exceeded on 23 days. PM2.5 exceeded the state annual air quality standard every year from 2001 through 2004 and the federal 24-hour standard on four days during 2001-2004. CO, NO_2, SO_2, and lead concentrations did not exceed either the CAAQS or the NAAQS during these four years.

1.4.2 Hazards and Hazardous Materials

The refinery imports, stores and processes several toxic and flammable materials to refine crude oil and produce motor fuels and other products. Accidental releases of these materials, caused by either natural events such as an earth quake or by equipment failures or human error, could lead to fires, explosions or exposure of people to toxic gases.

Chevron has developed a Risk Management Plan as required under the federal Risk Management Program (RMP) and California Accidental Release Program (CalARP) regulations.

The City of El Segundo Fire Department administers these programs for the refinery. In addition, the refinery has prepared an emergency response manual, which describes the emergency response procedures that would be followed in the event of any of several release scenarios and the responsibilities for key response personnel. Chevron also maintains its own emergency response capabilities, including on-site equipment and trained emergency response personnel who are available to respond to emergency situations anywhere within the refinery.

Based on a review of current operations of the equipment that is proposed to be modified in the affected refinery units (No. 4 Crude Unit, Coker and No. 6 H_2S Plant), the upset conditions that would currently have the greatest potential impacts would result in release and subsequent ignition of flammable vapors or liquids in the Coker. However, the impacts from these releases would not extend beyond the refinery boundary and would not affect the public.

1.4.3 Hydrology and Water Quality

The refinery currently consumes approximately 10 million gallons of water per day. Approximately 2.6 million gallons per day of fresh/potable water, which is purchased from the West Basin Municipal Water District (WBMWD), is used. In addition, approximately 7.5 million gallons per day of reclaimed water, which is also purchased from the WBMWD, is consumed. Approximately 200,000 gallons of reclaimed water per day are used for irrigation of refinery landscaping, approximately 3.5 million gallons per day of nitrified reclaimed water are used for the cooling towers, and approximately 3.8 million gallons per day of reclaimed water are used for boiler feed water.

Under its National Pollutant Discharge Elimination System (NPDES) Permit, the refinery is authorized to discharge up to 8.8 million gallons of treated wastewater during dry weather and up to 23 million gallons per day during wet weather to the Pacific Ocean, near Dockweiler State Beach in El Segundo. The wastewater is discharged through Refinery Outfall 001, which is located approximately 3,500 feet offshore. Currently, the refinery discharges approximately seven million gallons per day of treated wastewater during dry weather.

1.4.4 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 (El Segundo Boulevard, Sepulveda Boulevard, Rosecrans Avenue, and Vista Del Mar Avenue).

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 Grant Avenue approximately one-eighth mile north of the refinery.

A noise survey was performed north of the refinery in December 2000 and south of the refinery in January 2001. Current refinery facilities and equipment, as well as surrounding land uses, are essentially the same as in 2001. Thus, results from the survey are considered representative of current conditions. Based on the noise survey, the existing community noise equivalent level (CNEL) in the residential area to the south of the refinery is 59 to 62 dBA, which is in the "normally acceptable" to "conditionally acceptable" range for residential land use categories, but the measured noise levels at two residential locations in Manhattan Beach exceeded the Manhattan Beach's noise standards for residential receptors of 55 dBA during the day and 50 dBA at night. Noise levels at these residences are dominated by traffic noise.

The existing CNEL in the vicinity of commercial and residential areas to the north of the refinery, in the City of El Segundo, is 61 to 63 dBA, which is in the "normally acceptable" range for both commercial and residential land uses.

1.4.5 Solid and Hazardous Wastes

The refinery generated approximately 6,100 tons of non-hazardous solid wastes and 3,300 tons of hazardous wastes during 2004. These wastes were recycled, disposed in landfills, or incinerated.

Several landfills in Los Angeles County accept non-hazardous solid waste. The Bradley Canyon Landfill located in Sun Valley is operated by Waste Management, Inc., and is permitted to receive a maximum of 10,000 tons of solid waste per day. The Bradley Canyon Landfill is expected to close in June 2007. The Los Angeles County Sanitation District maintains three active Class III landfills that handle approximately 20,000 tons per day of non-hazardous solid waste. These landfills include Puente Hills Landfill, Scholl Canyon Landfill, and Calabasas Landfill. Projected closure dates for the three landfills range from 2013 at Puente Hills Landfill to 2028 at Calabasas. Permitted daily capacity ranges from 3,400 tons per day at Scholl Canyon to 13,200 tons per day at Puente Hills.

There are two Class I landfills in California that are approved to accept hazardous wastes. Chemical Waste Management Corporation in Kettleman City, California is a treatment, storage, and disposal facility that has a permitted capacity of approximately 10.7 million cubic yards. Clean Harbors operates a Class I landfill in Buttonwillow, California that has a permitted capacity of 14.3 million cubic yards and an expected closure date of 2040.

1.4.6 Transportation and Traffic

The transportation network in the vicinity of the refinery includes surface streets and two freeways (Interstate 105 to the north of the refinery and Interstate 405 to the east of the refinery). Traffic count information to establish existing conditions at intersections in El Segundo was obtained from several sources, including manual traffic counts in late 2005 and early 2006 at 14 intersections, as

well as traffic data from the Final EIR for the Sepulveda/Rosecrans Site Rezoning and Plaza El Segundo Development project in the City of El Segundo. The level of service (LOS) at these intersections ranges from A (best) to F (worst), with five of the intersections operating at unacceptable levels (LOS E or F).

1.5 Chapter 4 Summary - Potential Environmental Impacts and Mitigation Measures

This section summarizes the environmental impacts, mitigation measures, and residual impacts associated with the proposed project. Impacts are divided into four classifications: Unavoidable Adverse Impacts, Potentially Significant but Mitigable Impacts, Less Than Significant Impacts, and Beneficial Impacts. Unavoidable adverse impacts are significant impacts that require a Statement of Findings pursuant to CEQA Guidelines §15091 and a Statement of Overriding Considerations to be issued per CEQA Guidelines §15093 if the project is approved. Potentially Significant but Mitigable Impacts are adverse impacts that can be feasibly mitigated to less than significant levels. The SCAQMD interprets §15091 to require findings only if impacts are significant. If an impact is mitigated to insignificance, findings are not required. Less than significant impacts may be adverse but do not exceed any significance threshold levels and do not require mitigation measures. Beneficial impacts reduce existing environmental problems or hazards.

1.5.1 Unavoidable Adverse Impacts

Air Quality: Construction emissions of CO, volatile organic compounds (VOC) and nitrogen oxides (NO_x) are expected to remain significant following mitigation. Construction emissions of NO_x may cause significant adverse impacts to localized ambient NO_2 air quality following mitigation.

Hazards: The proposed modifications to the No. 6 H_2S Plant could result in potential public exposure to significant adverse H_2S concentrations under "worst-case" consequence analysis conditions. As a result, the potential consequences of a release of H_2S associated with these modifications are significant.

1.5.2 Potentially Significant but Mitigable Adverse Impacts

Air Quality: Construction emissions of PM10 are expected to be reduced to less than significant levels following mitigation.

Noise: Construction noise impacts are expected to be reduced to less than significant levels following mitigation.

1.5.3 Less Than Significant Impacts

Air Quality: Construction emissions of SO_x are expected to be less than significant.

On-site CO and PM10 construction emissions are not expected to cause significant localized ambient air quality impacts.

Operational CO, VOC, NOx, SOx and PM10 emissions are less than significant.

The estimated maximum individual cancer risk due to the operation of the proposed project at the refinery is expected to be less than the significance threshold of 10 per million so that the project impacts are less than significant.

The acute hazard index and the chronic hazard index from exposure to non-carcinogenic compounds during operation of the proposed project are both less than the significance threshold of 1.0 so that the project impacts are expected to be less than significant.

The estimated maximum individual cancer risk due to diesel exhaust particulate matter emissions from refinery export trucks and from marine crude oil tanker hoteling during operation of the proposed project are expected to be less than the significance threshold of 10 per million so that the project impacts are expected to be less than significant.

Ambient air quality CO, NOx and PM10 impacts during operation are expected to be less than significant.

No significant traffic impacts were identified at local intersections so no significant increases in CO hot spots are expected.

Potential odor impacts from the proposed project are expected to be less than significant.

Hazards: The proposed modifications to the No. 4 Crude Unit and the Coker are not expected to result in significant adverse impacts.

Hydrology/
Water Quality: The proposed project is not expected to cause significant adverse impacts to water supply, water quality or wastewater disposal during construction or operation.

Noise: Operation of the proposed project is not expected to cause significant adverse noise impacts.

Solid/Hazardous
Waste: The proposed project is not expected to cause significant adverse impacts from generation of solid or hazardous wastes during construction or operation.

Traffic/
Transportation: The proposed project is not expected to cause significant adverse impacts to traffic or transportation during construction or operation.

Potential impacts, mitigation measures, and impacts remaining after mitigation are summarized in Table 1.5-1.

Table 1.5-1
Summary of Impacts and Mitigation Measures

Impact	Mitigation Measures	Residual Impact
Air Quality		
Construction emissions of CO, VOC, NO_x and PM10 are significant.	Mitigation measures include fueling construction equipment with emulsified diesel; requiring construction equipment ~~rated at 100 hp or more~~ to meet Tier 2 or Tier 1 emission standards for off-road engines or, if equipment is rated at 100 hp or more and equipment meeting Tier 2 or Tier 1 standards is not available, to be equipped with ~~catalyzed~~ diesel particulate filters, if feasible; maintaining and tuning construction equipment engines according to manufacturers' specifications; limiting engine idling to five minutes; applying retrofit technologies such as selective catalytic reduction, oxidation catalysts, air enhancement, etc. to construction equipment if technologies are commercially available; using electric welders instead of diesel or gas welders when electricity is available; using on-site electric power instead of diesel generators where electricity is available; sweeping paved roads used by on-site construction vehicles; watering active excavation and storage pile locations a minimum of three times per day; and using coatings with no more than 100 g/l VOC.	Mitigation measures will reduce construction emissions of PM10 to less than significant. Construction CO, VOC, and NO_x emissions are expected to remain significant after mitigation.
On-site NO_x construction emissions may cause significant localized NO_2 ambient air quality impacts.	Same as above	On-site NO_x construction emissions may cause significant NO_2 ambient air quality impacts after mitigation.
Construction emissions of SO_x are less than significant.	None required	SO_x construction emissions are expected to be less than significant.
On-site CO and PM10 construction emissions are not expected to cause significant localized ambient air quality impacts.	No additional required	On-site CO and PM10 construction emissions are not expected to cause significant localized ambient air quality impacts.

Table 1.5-1 (continued)
Summary of Impacts and Mitigation Measures

Impact	Mitigation Measures	Residual Impact
Air Quality (continued)		
Operational CO, VOC, NO_x, SO_x and PM10 emissions are less than significant.	None required	Operational CO, VOC, NO_x SO_x and PM10 emissions are expected to be less than significant.
The estimated maximum individual cancer risk due to the operation of the proposed project at the refinery is expected to be less than the significance threshold of 10 per million so that the project impacts are less than significant.	None required	Cancer risk impacts from operation of the proposed project at the refinery are expected to be less than significant.
The acute hazard index and the chronic hazard index from exposure to non-carcinogenic compounds during operation of the proposed project are both less than the significance threshold of 1.0 so that the project impacts are less than significant.	None required	Non-cancer risk impacts from operation of the proposed project are expected to be less than significant.
The estimated maximum individual cancer risk due to diesel exhaust particulate matter emissions from refinery export trucks and from marine crude oil tanker hoteling during operation of the proposed project are expected to be less than the significance threshold of 10 per million so that the project impacts are less than significant.	None required	Cancer risk impacts from refinery export truck and marine crude oil tanker emissions are expected to be less than significant.
Ambient air quality CO, NO_x and PM10 impacts during operation are less than significant.	None required	Ambient air quality CO, NO_x and PM10 impacts during operation are expected to be less than significant.
No significant traffic impacts were identified at local intersections so no significant increases in CO hot spots are expected.	None required	CO hot spot impacts are expected be less than significant.
Potential odor impacts from the proposed project are expected to be less than significant.	None required	Odor impacts are expected to be less than significant.

Table 1.5-1 (continued)
Summary of Impacts and Mitigation Measures

Impact	Mitigation Measures	Residual Impact
Hazards		
Impacts associated with modifications to No. 6 H_2S Plant could result in off-site exposure to H_2S at levels that could cause injury.	Perform a pre-startup safety review by qualified personnel.	Hazard impacts associated with modifications to the No. 6 H_2S Plant are expected to remain significant.
Hazard impacts associated with modifications to the No. 4 Crude Unit and the Coker are not expected to be significant.	None required	Hazard impacts associated with modifications to the No. 4 Crude Unit and the Coker are not expected to be significant.
Hydrology and Water Quality		
No significant adverse water demand, water quality, or wastewater disposal impacts are expected during construction or operation of the proposed project.	None required	No significant adverse water demand, water quality, or wastewater disposal impacts are expected during construction or operation of the proposed project.
Noise		
Construction of the proposed project may cause significant adverse noise impacts	Locate compressors used during construction of the proposed No. 4 Crude Unit modifications south of existing process equipment or shield them with 3/4-inch thick plywood shrouds located on the north side of the compressors.	Noise impacts during construction of the proposed project are not expected to be significant after mitigation.
Operation of the proposed project is not expected to cause significant adverse noise impacts.	None required.	Operation of the proposed project is not expected to cause significant adverse noise impacts.
Solid and Hazardous Wastes		
Solid and hazardous wastes generated during construction of the proposed project are not expected to cause significant adverse impacts.	None required	Solid and hazardous wastes generated during construction of the proposed project are not expected to cause significant adverse impacts.
Operation of the proposed project is not expected to generate additional solid or hazardous wastes, so no impacts will occur.	None required	Operation of the proposed project will not cause significant adverse impacts to solid or hazardous wastes.

Table 1.5-1 (concluded)
Summary of Impacts and Mitigation Measures

Impact	Impact	Impact
Traffic and Transportation		
Significant adverse impacts on local intersections are not expected during construction or operation of the proposed project.	None required	Significant adverse impacts on local intersections are not expected during construction or operation of the proposed project.
Significant adverse impacts to freeway segments in the vicinity of the proposed project are not expected during construction or operation of the proposed project.	None required	Significant adverse impacts to freeway segments in the vicinity of the proposed project are not expected during construction or operation of the proposed project.

1.5.4 Growth Inducing Impacts of the Proposed Project

The proposed project is not expected to foster population growth in the area, nor will additional housing or infrastructure be required. The project involves the modification of existing industrial facilities and additional refinery workers are not expected to be needed. No new services will be required; therefore, no infrastructure development or improvement will be required, and no population growth will be encouraged as a result of the proposed project.

1.5.5 Significant Irreversible Environmental Changes

Irreversible changes include a large commitment of nonrenewable resources, committing future generations to specific uses of the environment (e.g., converting open spaces into urban development), or enduring environmental damage due to an accident.

The proposed project involves modifications to an existing refinery, located within an industrial area, which has been operating since 1911. Therefore, there is no major commitment of nonrenewable resources or changes that would commit future generations to specific uses of the environment.

1.5.6 Environmental Effects Found Not to be Significant

In the IS, 11 environmental areas were determined not to be significant: Aesthetics, Agricultural Resources, Biological Resources, Cultural Resources, Energy, Geology and Soils, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, and Recreation.

1.6 Chapter 5 Summary - Project Alternatives

Pursuant to CEQA Guidelines §15126.6, this ~~Draft~~ Final EIR identifies and compares the relative merits of a range of reasonable alternatives to the proposed project. A detailed discussion of the alternatives is presented in Chapter 5.

In order to evaluate the environmental impacts of the proposed project, the environmental characteristics of the existing environment has been compared to the proposed project as well as the environmental impacts of two project alternatives. The two project alternatives consider other possible means of feasibly attaining some or all of the objectives of the proposed project that would avoid or substantially lessen any of the significant effects of the proposed project, and provide a means for evaluating the comparative merits of each alternative. These alternatives to the project would implement the proposed project except for the following differences:

- **Alternative 1 - Use the Existing Coker Main Fractionator Column Instead of Replacing It with a Larger, More Efficient Column.**

  Alternative 1 would use the existing Coker Main Fractionator column and not replace it with a new column. The new column would be constructed on-site under the proposed project. So, by not installing a new Coker Main Fractionator column, on-site construction activities under Alternative 1 would be substantially reduced. It would reduce the peak construction workforce by 60 workers and avoid the use of one 600-ton crane, one 230-ton crane, two welders, and a portable heater that would be used for stress relief for the new column.

  This alternative was not included as part of the proposed project because the capacity of the existing Coker Main Fractionator column would limit the increase in heavy crude oil that could be processed by the refinery to approximately one-quarter of the increase that could be realized by the proposed project. Thus, Alternative 1 would only partially meet the objective of the project to increase the quantity of heavy crude oil processed by the refinery.

- **Alternative 2 - Add Heating and Insulation to Crude Oil Storage Tanks**

  Crude oil imported to the refinery is stored in tanks prior to processing. Heavy crude oil requires heating to reduce its viscosity so that it can be handled in the refinery. The refinery currently has three different crude oil storage and feed systems, each containing multiple storage tanks. Only one of those systems includes tanks that are heated and insulated to handle heavy crude oil. The other two crude oil storage and feed systems are not heated, so they cannot handle heavy crude oil.

  Chevron currently imports and stores heavy crude oil from different sources at the same time. Because crude oils from different sources have different properties, such as sulfur content, they need to be stored in separate storage tanks. The refinery currently has sufficient heated crude oil storage tank capacity to store the additional quantity of heavy crude oil that will be imported during operation of the proposed project, but the number of different types of heavy crude oil that Chevron can store at the same time will decrease. Alternative 2 would provide additional heavy crude oil storage capacity that would enable the refinery to maintain its current capabilities to store heavy crude oil from multiple

sources during operation of the proposed project. This alternative was not included as part of the proposed project because the increased flexibility to store heavy crude oils from multiple sources was not considered to be absolutely necessary by Chevron for the cost to implement it.

Currently, as well as during operation of the proposed project, marine tankers occasionally need to wait offshore or in the Port of Los Angeles before they offload at the ESMT because of a number of reasons. One primary reason is if the tankers are carrying a different type of heavy crude oil than is already in storage at the refinery and none of the heavy crude oil storage tanks is empty. Alternative 2 would potentially reduce the amount of time that marine tankers would need to wait before offloading heavy crude oil by increasing the number of storage tanks that can accommodate heavy crude oil. By allowing the marine tankers to unload heavy crude oil sooner, emissions from the idling of marine tankers as well as emissions from the hoteling (auxiliary power) sources are reduced. However, the reduction in the amount of time tankers would need to wait to offload cannot be predicted at this time because the quantities of heavy crude oil that will be in refinery storage tanks when a crude oil tanker arrives with a different type of heavy crude oil cannot be predicted. Thus, related emission reductions cannot be quantified.

Alternative 2 includes adding insulation to one crude oil storage tank, adding heating systems to two crude oil storage tanks, adding piping, and upgrading pumps associated with crude oil storage tanks to enable them to handle the higher viscosity crude oil.

Construction of the crude oil storage tank modifications would take place from September 2006 through December 2006 and require a peak of 25 additional construction workers as well as the use of additional construction equipment. No additional employees will be required on-site to operate any new equipment as a result of implementing Alternative 2.

A third alternative, the "no project" alternative, was also evaluated as required by CEQA §15126.6(e). Under the "no project" alternative, Chevron would not implement any portions of the proposed project, and there would not be any potential impacts to the existing environment. However, none of the objectives of the proposed project would be met. In the future, refinery output would be reduced as available crude oils become heavier, assuming permit conditions are not exceeded, because the production capacity of the equipment that currently processes light crude oil would be reduced when processing heavy crude oil. Alternatively, the costs to main current production levels would increase as the price of lighter crude oils increases and overall supply is reduced. Both of these situations would threaten the future economic viability of the refinery and supplies to the regional community.

The significance of potential environmental impacts from the alternatives as compared to the proposed project are summarized in Table 1.6-1.

Table 1.6-1
Significance of Environmental Impacts of Alternatives Compared with the Proposed Project

Environmental Topic	Proposed Project[a]	Alternative 1[a]	Alternative 2[a]	"No Project" Alternative[a]
Air Quality				
Construction	S	S (-)	S (=)[b]	N (-)
Operation	N	N (=)	N (+)	N (-)
Toxics	N	N (=)	N (+)	N (-)
Hazards	S	S (=)	S (=)	N (-)
Hydrology/ Water Quality				
Construction	N	N (-)	N (=)	N (-)
Operation	N	N (=)	N (=)	N (-)
Noise				
Construction	M	M (=)	M (+)	N (-)
Operation	N	N (=)	N (=)	N (-)
Solid/Hazardous Waste				
Construction	N	N (-)	N (+)	N (-)
Operation	N	N (=)	N (=)	N (=)
Traffic/ Transportation				
Construction	N	N (-)	N (+)	N (-)
Operation	N	N (=)	N (=)	N (-)

[a] Key:
S = Significant
N = Less than significant
M = less than significant after mitigation
(+) = Greater impacts than proposed project
(=) = same impacts as proposed project
(-) = Less impacts than proposed project

[b] Although Alternative 2 will require more construction activities and manpower than the proposed project, construction activities for Alternative 2 do not overlap with the other construction activities that cause the peak daily construction emissions.

1.7 Chapter 6 Summary - Cumulative Impacts

In order to assess cumulative impacts, other planned projects within and in the area of the refinery were identified. These cumulative impacts and discussion are presented in Chapter 6.

Following are the conclusions from the cumulative impacts analyses:

1.7.1 Unavoidable Adverse Cumulative Impacts

Air Quality: Cumulative construction emissions of CO, VOC, NO_x and PM10 are expected to remain significant following mitigation.

Operational emissions of CO, VOC, NO_x and PM10 are expected to be cumulatively significant. Because emissions of these pollutants during the operation of the proposed project by itself are not significant, feasible mitigation measures for the proposed project have not been identified.

Hazards: The proposed modifications to the No. 6 H_2S Plant could result in public exposure to significant adverse H_2S concentrations under "worst-case" consequence analysis conditions. As a result, the potential consequences of a release of H_2S associated with these proposed modifications are cumulatively significant.

Traffic/
Transportation: Traffic associated with construction of the proposed project will cause a significant adverse cumulative impact on two freeway segments. Feasible mitigation measures for these potential impacts have not been identified.

1.7.2 Potentially Significant but Mitigable Adverse Cumulative Impacts

Noise: Cumulative construction noise impacts are expected to be reduced to less than significant levels without additional mitigation.

1.7.3 Less Than Significant Cumulative Impacts

Air Quality: Cumulative construction emissions of SO_x are expected to be less than significant.

On-site CO and PM10 construction emissions are not expected to cause significant cumulative localized ambient air quality impacts.

Cumulative operational SOx emissions are less than significant.

Cumulative adverse health impacts are less than significant.

Cumulative ambient air quality CO, NOx and PM10 impacts during operation are expected to be less than significant.

No significant traffic impacts were identified at local intersections so no significant cumulative increases in CO hot spots are expected.

Cumulative potential odor impacts are expected to be less than significant.

Hazards: The proposed modifications to the No. 4 Crude Unit and the Coker are not expected to result in significant adverse cumulative impacts.

Hydrology/
Water Quality: The proposed project is not expected to cause significant adverse cumulative impacts to water supply, water quality or wastewater disposal during construction or operation.

Noise: Operation of the proposed project is not expected to cause significant adverse cumulative noise impacts.

Solid/Hazardous Waste: The proposed project is not expected to cause significant adverse cumulative impacts from generation of solid or hazardous wastes during construction or operation.

Traffic/ Transportation: The proposed project is not expected to cause significant adverse cumulative impacts to traffic or transportation during operation.

1.8 Chapters 7 and 8 Summary – Persons and Organizations Consulted and References

Information on persons and organizations contacted and references cited is presented in Chapters 7 and 8, respectively.