SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

FINAL MITIGATED NEGATIVE DECLARATION FOR:

BP CARSON REFINERY COMPLIANCE AND SAFETY PROJECT

SCH No. 2005051150

June 2005

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PREFACE

This document constitutes the Final Mitigated Negative Declaration (MND) for the BP Carson Refinery Compliance and Safety Project. The Draft MND was released for a 30-day public review and comment period beginning on May 26, 2005, and ending on June 24, 2005. No comment letters were received from the public relative to the Draft MND. Note that some minor modifications for clarity and continuity as well as to correct some typographical errors have been made to the Draft MND since its release for public review and comment. To facilitate in identification, modifications to the document are included as underlined text and text removed from the document is indicated by ~~strikethrough~~.

None of the modifications alter any conclusions reached in the Draft MND, provide new information of substantial importance relative to the draft document, or constitute significant new information that would require recirculation of the Draft EA pursuant to CEQA Guidelines §15073.5. Therefore, this document is now a Final MND.

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INTRODUCTION

BP West Coast Products LLC (BP) is proposing modifications to four components at its Carson Refinery. These four components are collectively known as the BP Carson Refinery Compliance and Safety Project. The purposes of these modifications are to: 1) eliminate releases of hydrogen sulfide (H_2S) and ammonia (NH_3) from a sour water surge tank, known as Tank 710 in the sour water treatment system; 2) reduce excessive maintenance and outages associated with the refinery's No. 51 Vacuum Distillation Unit; 3) prevent uncontrolled, direct atmospheric releases of pollutants during equipment overpressure from the refinery's No. 1 Crude Unit; and 4) prevent uncontrolled, direct atmospheric releases of pollutants during equipment overpressure from the refinery's Butane Tank Car Loading Rack.

Tank 710 receives sour water, which is water that contains H_2S and NH_3 produced by various refinery processing units. The design of Tank 710 has allowed the venting of H_2S and NH_3 directly to the atmosphere when the internal tank pressure has exceeded safe limits. Tank 710 has been the subject of odor complaints and caused violations of South Coast Air Quality Management District (SCAQMD) Rule 402 - Prohibition of Nuisances. BP is proposing to replace the existing Tank 710 with a new sour water surge tank that is designed to prevent these releases and, thus, avoid future odor complaints and violations of Rule 402.

The No. 51 Vacuum Distillation Unit (No. 51 VDU) performs one of the initial steps in refining crude oil at the Carson Refinery. The No. 51 VDU was the subject of a notice of violation (NOV) issued by the SCAQMD in May 2004 for "failure to maintain equipment in good operating condition." Additionally, this unit has required excessive maintenance and experienced a number of unscheduled outages during the last 10 years. To remedy the NOV, BP is proposing to replace several components of the No. 51 VDU, including the vacuum distillation tower, to reduce maintenance requirements and the occurrence of unplanned outages.

The No. 1 Crude Unit performs the initial step in refining most of the crude oil processed by the refinery. At the time when the No. 1 Crude Unit was constructed, the pressure relief valves were designed to release pollutants directly to the atmosphere when internal pressures within equipment at the crude unit approach unsafe levels. To comply with SCAQMD Rule 1173 - Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants, BP is proposing to replace the No. 1 Crude Unit's existing pressure relief valves with a system that will control emissions to the atmosphere when excessive internal pressures build up in equipment at the unit.

The Butane Tank Car Loading Rack has six stations to load or unload railroad tank cars with Butane, Isobutane, Butane/Butylene stock or Pentane. In addition to the loading equipment, the loading rack area also contains a Butane Unloading Surge Drum, a Low Line Knockout Drum, and a Butane Repressurizing Vaporizer. The Butane Unloading Surge Drum, Low Line Knockout Drum, and Butane Repressurizing Vaporizer each are equipped with a pressure-activated relief valve that discharge directly to the atmosphere in the event of an emergency release. To comply with Rule 1173, BP proposes to replace all three pressure relief valves and route the discharges to the South Area (Coker) Flare.

This CEQA Mitigated Negative Declaration (MND) assesses the environmental impacts of these

four components of the proposed refinery Compliance and Safety Project. Because each of the proposed modifications would occur in different refinery units, and the implementation of any one of the proposed modifications is not dependent on implementation of the other proposed modifications, the four sets of actions comprising the proposed refinery Compliance and Safety Project are not part of a single project or "related" projects as would be typically defined by CEQA. However, the four proposed modifications are intended to improve the safety of operations at the refinery and to comply with SCAQMD rules. Additionally, the construction and operation schedules of the four components of the proposed modifications will overlap. Because of this spatial and temporal overlap, impacts from implementing the proposed modifications of the BP Carson Refinery Compliance and Safety project will overlap within the same geographic area (e.g., the Carson Refinery and vicinity) during both construction and operation. Therefore, evaluating the four components of the proposed modifications as a single project ensures that potential overlapping impacts are evaluated and disclosed to the public.

AGENCY AUTHORITY

The California Environmental Quality Act (CEQA) applies to proposed "projects" initiated by, funded by, or requiring discretionary approvals from State or local government agencies. The proposed refinery modifications constitute a "project" as defined by CEQA (California Public Resources Code §§21000 et seq.). To fulfill the purpose and intent of CEQA, the SCAQMD is the lead agency for this project and has prepared this MND to address the potential environmental impacts associated with the BP Carson Refinery Compliance and Safety Project. A Mitigated Negative Declaration for a project subject to CEQA is prepared when the Initial Study of the project identifies potentially significant effects, but mitigation measures are included to mitigate the effects to a point where no significant effects would occur (CEQA Guidelines §15070(b)).

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 and, therefore, it is subject to the requirements of CEQA (Public Resources Code, §21000 et seq.). Since the SCAQMD has the greatest responsibility for supervising or approving the project as a whole, it was determined that the SCAQMD would be the most appropriate public agency to act as lead agency (CEQA Guidelines §15051(b)).

PROJECT LOCATION

The location of the BP Carson Refinery within the overall southern California region is shown in **Figure 1-1**. The refinery is located at 1801 East Sepulveda Boulevard in the City of Carson, California, as shown on **Figure 1-2**. The refinery occupies an irregularly shaped parcel of land between Wilmington Avenue on the west, 223rd Avenue on the north, Alameda Avenue on the east, and Sepulveda Boulevard on the south. The refinery and adjacent property are zoned MH (manufacturing heavy). The Dominguez Channel, which originates in the area southeast of the Los Angeles International Airport, traverses refinery property, and eventually flows into the East Channel of the Los Angeles Harbor. The proposed locations within the refinery for the replacement sour water surge sphere (Tank 710), replacement No. 51 VDU, the No. 1 Crude Unit pressure relief valves modifications, and the Butane Tanker Loading Rack pressure relief valves modifications are shown in **Figure 1-3**.

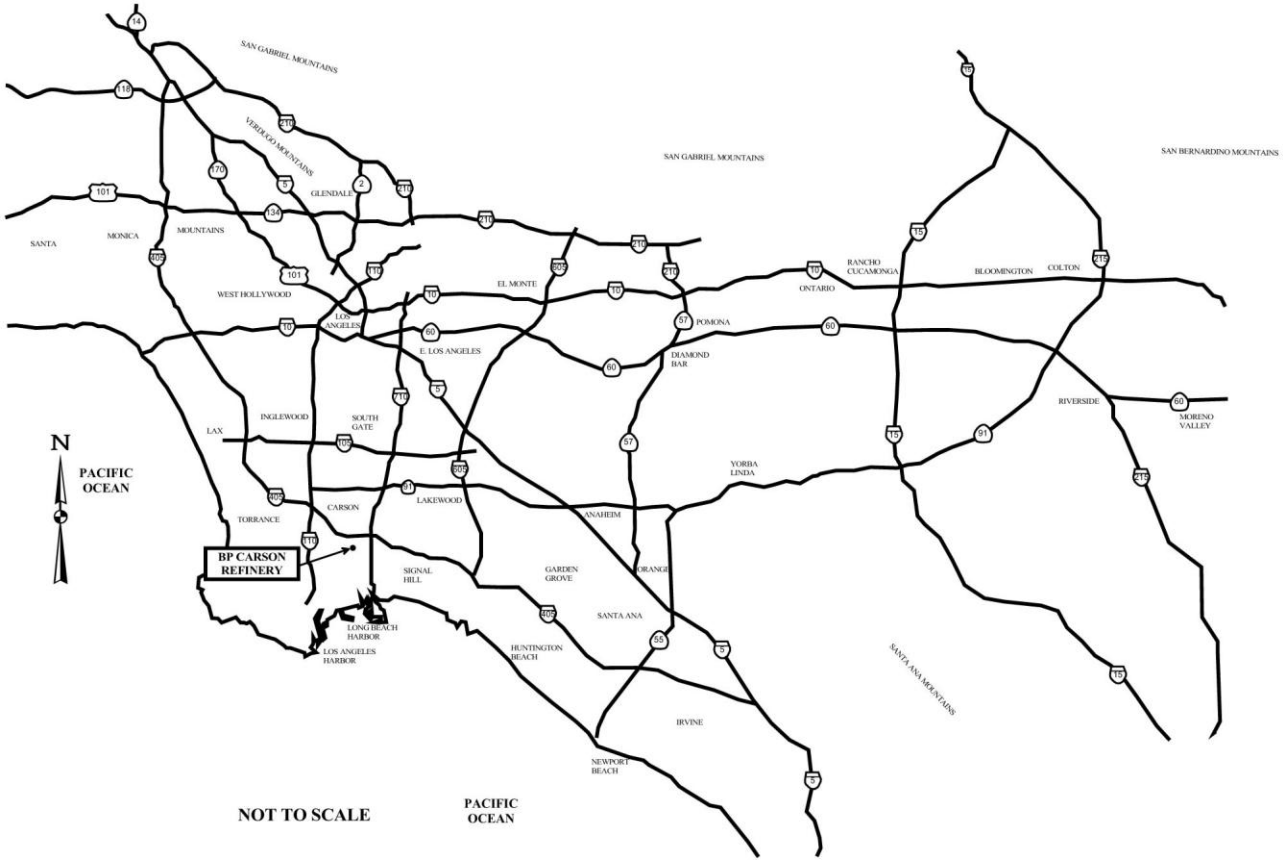

Figure 1-1 Regional Location Map

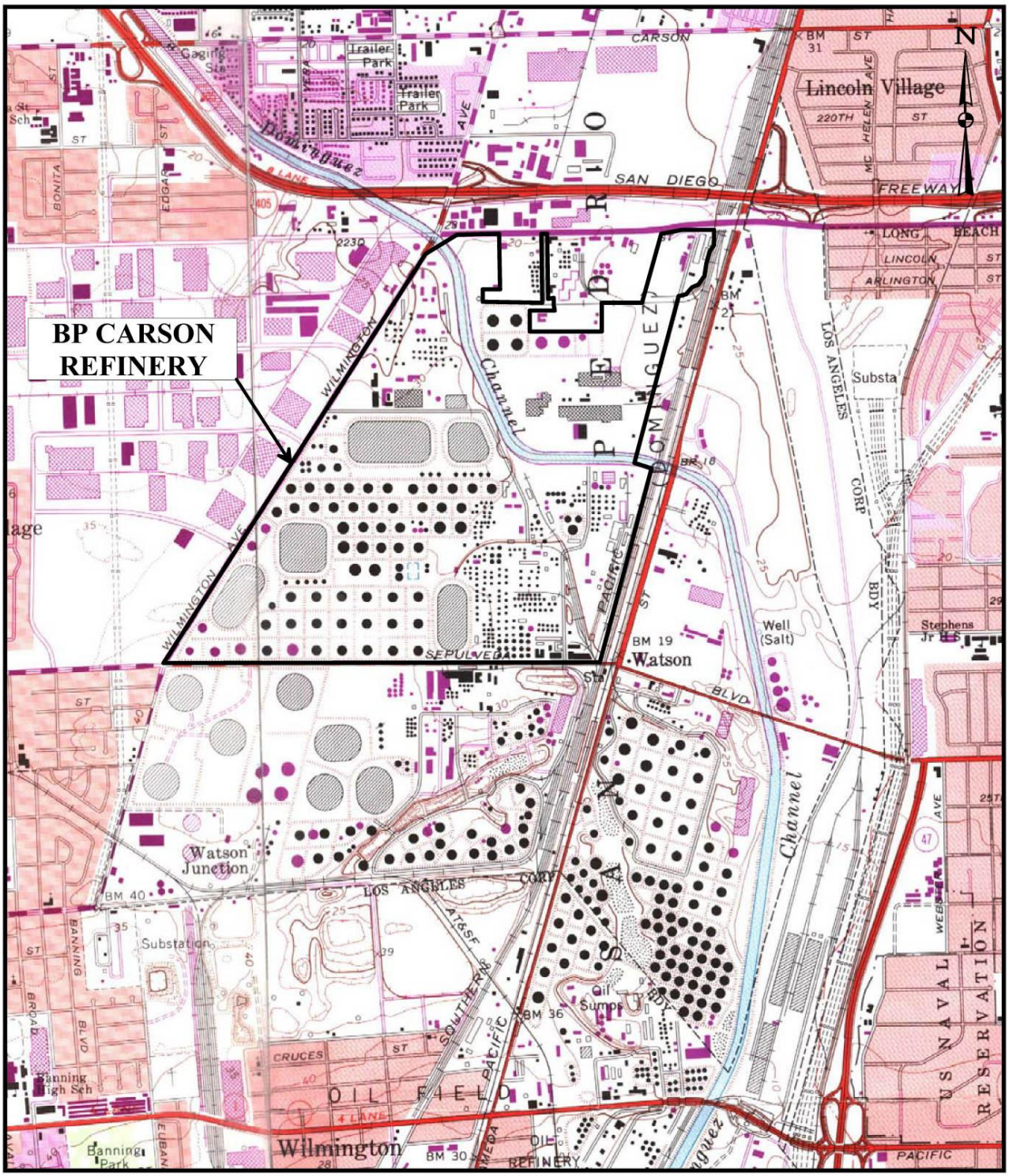

Figure 1-2 Site Location Map BP Carson Refinery

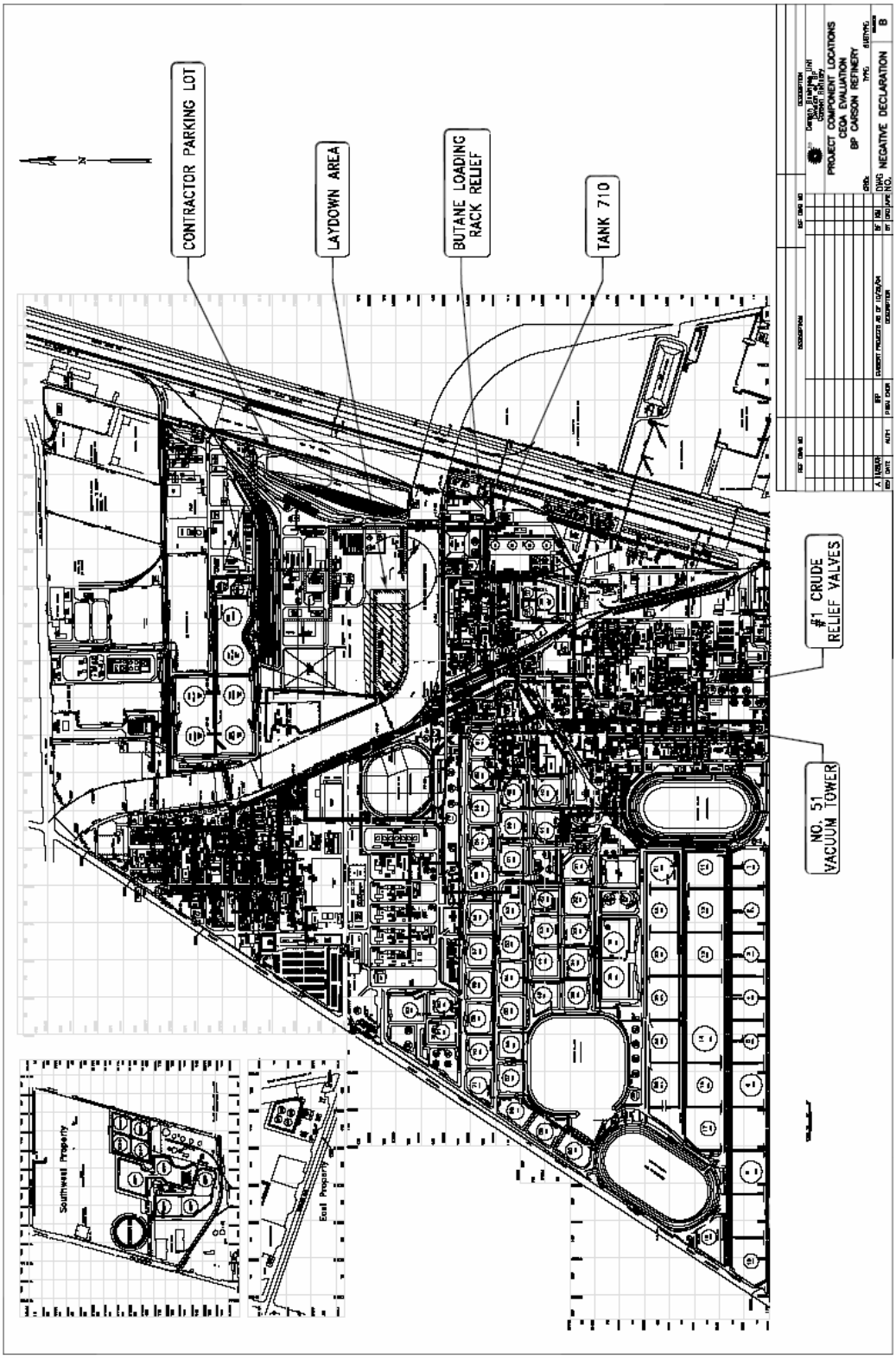

Figure 1-3 Site Plan Showing Locations of Project Components

PROJECT DESCRIPTION

The following discussion provides an overview of the petroleum refining process. This discussion is intended to enhance the reader's understanding of the proposed project.

Overview of Petroleum Refining

All crude oil consists of a mixture of hydrocarbons, which are chemical compounds made up of hydrogen and carbon atoms that are combined into molecules of different sizes, shapes, and degrees of complexity. The smallest hydrocarbons in crude oil contain only a few atoms of hydrogen and carbon and are gases, such as propane and butane. Somewhat larger hydrocarbon molecules are liquids, such as gasoline and diesel fuel. Very large hydrocarbon molecules are solids, such as asphalt and tar. Crude oil also contains impurities, such as sulfur and metals.

The overall purpose of the refinery is to separate these mixtures in the crude oil into useful refinery products. This separation is accomplished by heating the crude oil in order to change the form of the complex hydrocarbon mixtures from liquids to vapors and then separating the different hydrocarbon compounds by their physical properties. **Figure 1-4** is a simplified overview of refinery operations which shows the incoming crude oil, key refinery processing operations and key refinery products.

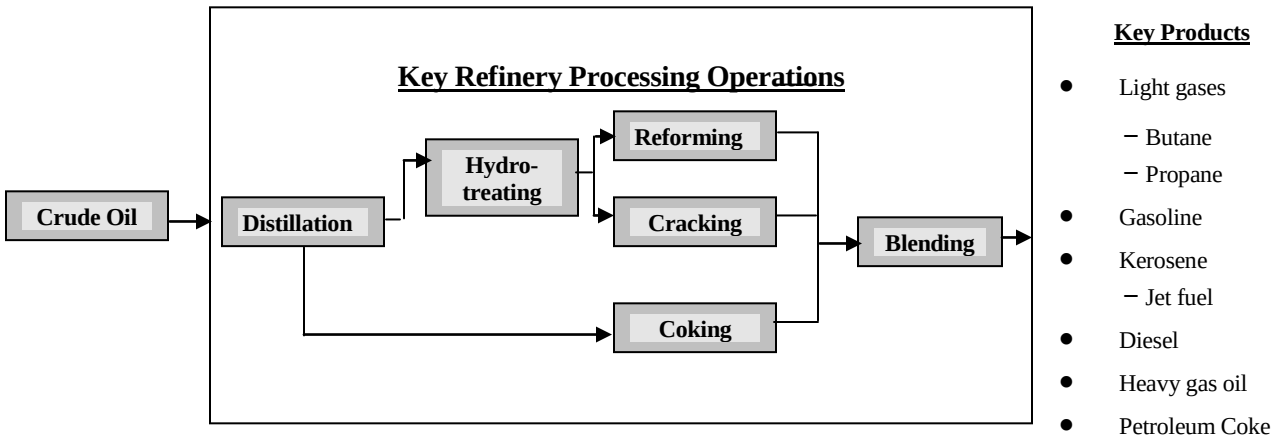

Figure 1-4 Simplified Overview of Petroleum Refinery Operations

The first major step in the refining process is to heat the crude oil until it is partly vaporized. The heated vapors are then introduced into what are called "distillation units," where the mixed hydrocarbon vapors rise through the distillation columns. The distillation process takes advantage of the fact that hydrocarbons boil at different temperatures and pressures according to the size of their molecules. Inside the distillation columns are a series of horizontal trays that allow separation of the many types of hydrocarbon compounds into several distinct streams. The temperature at the bottom of the distillation column is higher than at the top, so that heavy hydrocarbons with high boiling points condense on the lower trays of the tower and lighter

hydrocarbons with lower boiling points condense on trays near the top.

Refineries have two types of distillation units, referred to as atmospheric and vacuum distillation units. Atmospheric distillation separates the hydrocarbon compounds under atmospheric pressure conditions. The vacuum distillation unit receives the heavy hydrocarbons collected from the lower trays of the atmospheric distillation unit and further separates these heavy hydrocarbons under a vacuum.

Certain hydrocarbon fractions from the distillation processes are further refined in a variety of refinery processes. These downstream processes change the molecular structure of hydrocarbon molecules by breaking them into small molecules, joining them together to form larger molecules, or reshaping them into higher quality molecules. Some of the major downstream processes are treating, cracking, reforming, and coking, each of which is briefly addressed in the following discussion.

In order to meet the product specifications for gasoline, diesel and other fuels, refineries use several processes to remove impurities, including a sulfur-removal technique called **hydrotreating**. In hydrotreating, the hydrocarbon mixture and hydrogen are heated together and then fed into a reaction chamber containing a catalyst. When the hydrocarbon and hydrogen molecules come in contact with the catalyst, a chemical reaction occurs that strips sulfur from the hydrocarbon to form hydrogen sulfide. Hydrogen sulfide is then sent to the refinery's sulfur recovery plant where the sulfides are converted to elemental sulfur.

Cracking takes large hydrocarbon molecules and uses a combination of catalysts, high pressures, and high temperatures to break the long carbon chains into shorter-chain hydrocarbons, including gasoline. There are two main types of cracking, called Fluid Catalytic Cracking and Hydrocracking. Fluid Catalytic Cracking yields mostly gasoline and diesel, as well as some light gases, while hydrocracking yields kerosene.

Reforming is a refining process designed to increase the volume of gasoline production at a refinery. Reforming uses high temperatures and catalysts to rearrange the chemical structure of certain hydrocarbons into gasoline molecules.

Coking is another process designed to increase the volume of liquid products, including gasoline, jet fuel and diesel, produced at a refinery. It is a high temperature cracking process that converts heavy hydrocarbons from distillation operations into lighter products that can be blended later into gasoline. Another product from the coking process is petroleum coke, which has a variety of uses ranging from electrodes in the aluminum industry to charcoal briquettes.

Blending is the final step in the production of finished refinery fuels. Blending involves mixing intermediate refinery streams in proportions to meet product specifications such as octane level and vapor pressure requirements for gasoline.

The following discussion describes each of the four modifications proposed by BP at the Carson Refinery.

Tank 710 Replacement

Sulfur and nitrogen compounds present in crude oil are converted to H_2S and NH_3 during the refining process. Because H_2S and NH_3 are gases, they are concentrated in off-gas process streams (process streams that are gases rather than liquids) from refinery process units. When process water comes into contact with these off-gas process streams, which contain H_2S and NH_3, the process water absorbs some of the H_2S and NH_3, forming what is called "sour water." Sour water can also contain hydrocarbons that are entrained from the off-gas process streams.

H_2S is a colorless, corrosive, and toxic compound that is heavier than air and has a strong obnoxious odor similar to rotten eggs. H_2S is both an irritant and an asphyxiating gas and has a low odor threshold of approximately 0.008 part per million (ppm). NH_3 is a toxic, colorless irritant that is lighter than air and has a sharp, pungent suffocating odor with an odor threshold of 17 ppm.

Sour water produced by the refinery process units at the Carson Refinery is currently sent to Tank 710. The sour water is pumped from Tank 710 to two other tanks, Tanks 774 and 775. Tanks 774 and 775 are feed tanks that supply the refinery's two sour water strippers, which remove H_2S, NH_3 and hydrocarbons from the sour water. The H_2S and NH_3 that have been stripped from the sour water are sent to the refinery's sulfur recovery plant and converted to elemental sulfur, nitrogen, and water. The elemental sulfur is subsequently removed from the refinery by truck and sold to industries such as chemical and fertilizer manufacturers. The nitrogen is vented to the atmosphere through a thermal oxidizer stack after it has been scrubbed with an amine solution to remove any residual H_2S. Some water is condensed in the tail gas units within the sulfur plant and returned to the sour water system.

Tank 710 is a cylindrically shaped structure with a fixed roof. It is 90 feet in diameter, 48 feet in height, and has a capacity of 55,000 barrels (bbl). Tank 710 is equipped with a system to skim liquid hydrocarbons off the surface of the sour water. A blanket of natural gas is maintained in the space above the sour water level at a slightly positive pressure to keep air out of the sour water system. In addition to the natural gas blanket, the space above the sour water contains vapors that evaporate from the sour water. These vapors include water as well as H_2S, NH_3, and hydrocarbon vapors. The hydrocarbon vapors are a result of evaporation of light hydrocarbons entrained in the sour water.

The space above the sour water level surface is vented to the refinery's vapor recovery system. A pressure activated control valve regulates the flow of vapors venting from the tank to the vapor recovery system. When the sour water level rises in the tank, the vapors floating above the sour water become compressed and the pressure increases in the tank. The pressure can also increase if there is an increased amount of light hydrocarbons contained in the sour water flowing into the tank. The pressure activated control valve opens when the pressure exceeds a preset level, and the vapors are then directed to the refinery's vapor recovery system.

Tank 710 can only withstand a maximum internal pressure in the vapor space above the sour water level of approximately 0.07 pound per square inch gauge (psig) without suffering damage to the physical structure of the tank. To prevent damage from occurring if the pressure approaches the maximum allowable level, the tank is equipped with pressure activated control valves and pressure

relief valves that vent to the atmosphere. Though vapors would normally be directed to the vapor recovery system for processing, there were several occasions when the diversion to the vapor recover system did not happen fast enough and the pressure relief valves opened and vented Tank 710 to the atmosphere. These venting events caused direct releases of H_2S and NH_3 emissions from Tank 710 to the atmosphere, which subsequently caused a nuisance resulting in a violation of the requirements in SCAQMD Rule 402 - Prohibition of Nuisances.

To prevent future direct atmospheric releases, BP is proposing to replace the existing cylindrical tank with a spherical tank. The sour water throughput for the new tank will be the same as the existing Tank 710 but, since the new tank will be a pressurized sphere, it will be able to withstand vapor pressures up to 47 psig. In the new sphere, the space above the sour water will contain H_2S, NH_3, hydrocarbon vapors and sometimes natural gas, which can be used to control the sphere's pressure. This space will be connected to pressure relief valves that will vent to the refinery's existing vapor recovery system, as well as to the coker low line system[1] and the South Area Flare. The pressure relief valves in the new sphere will not vent directly to the atmosphere, thereby eliminating the potential for direct releases of H_2S and NH_3 emissions into the atmosphere.

As with the existing tank, normal venting from the new tank will be routed to the vapor recovery system. Because the sour water throughput will not increase with the new tank and the vapor space volume will be the same or less than the vapor space of the existing tank, the load on the vapor recovery system will not increase. The new tank will be designed to vent to the coker low line system in the event of increased tank pressures. Further, in the extremely rare event that a fire occurs at or near the sphere and the flames and heat cause the internal tank pressure to approach the maximum allowable design pressure of 47 psig, the new tank will also be designed to vent to the South Area Flare.

The size of the new spherical tank will be 75 feet-9 inches in diameter with a capacity of 40,600 bbl and will be constructed at the same location as the existing Tank 710. BP intends to remove the existing Tank 710 from service and demolish it prior to commencing construction of the new sphere. Construction of the new sphere will require excavation to pour a new foundation, but no grading will be required since the area currently occupied by Tank 710 is flat.

During the period between removing Tank 710 from service and completing the construction of the new sphere, sour water will be routed directly to Tank 774. Sour water will then flow from Tank 774 to Tank 775 to feed the sour water strippers. Tanks 774 and 775 currently operate in sour water service and they each have the same capacity as the existing Tank 710 (55,000 bbl). In addition, Tanks 774 and 775 are equipped with a skimming system to remove hydrocarbons.

[1] The coker low line system collects gases from the south end of the refinery and routes them to the coker complex, where the gases are compressed, treated in amine scrubbers, and then routed to the refinery fuel system. The coker low line system functions as another vapor recovery system at the refinery. However, BP does not call it a "vapor recovery system" because "vapor recovery system" is a term defined in the refinery's air permit that is associated with another system at the refinery. This formal vapor recovery system operates under vacuum, whereas the coker low line system operates normally at 1.5 psig.

Even though Tanks 774 and 775 have the same capacity individually as the existing Tank 710, BP has concluded that Tank 710 cannot be permanently removed from service without replacing it with a new sphere for the following two reasons:

1) The total number of tanks that comprise the sour water system is based on the amount of total sour water working capacity needed to efficiently manage the maintenance of the tanks and the sour water strippers.

2) The new sphere is needed to remove vapors caused by evaporation of light hydrocarbons, H_2S and NH_3, contained in the sour water prior to the sour water entering Tanks 774 and 775. Tank 774 can withstand internal gaseous pressures of 0.22 psig, while Tank 775 can withstand internal gaseous pressures of 0.07 psig. Routing sour water to the new sphere before it flows to either Tank 774 or Tank 775 will enable both vapor and liquid hydrocarbons to be separated from the sour water, greatly reducing the possibility of either of those tanks venting to the atmosphere. Tank 710 has performed this function in the past. The design of the new sphere will directly vent light hydrocarbon vapors from the sour water tank to the refinery's vapor recovery system before the sour water can enter Tanks 774 and 775.

Construction of the new sphere is scheduled to begin during August 2005, subject to receipt of the permit to construct from SCAQMD. The completion of construction is scheduled during October 2006, and the tank would go into operation in November 2006. Construction activities are expected to require a maximum of approximately 43 workers and an average of 24 workers. Construction activities are anticipated to take place from 6:00 a.m. to 4:30 p.m. Most of the construction will occur four days per week, although work may occur on additional days during some weeks.

Once construction is completed, the new sour water sphere is expected to be operated with existing refinery staffing. The new tank would operate 24 hours per day 365 days per year.

No. 51 Vacuum Distillation Unit (VDU) Replacement

An initial step in the refining process at the Carson Refinery is the distillation of crude oil in the No. 1, No. 2, and No. 4 Crude Distillation Units. These crude distillation units heat the crude oil at atmospheric pressure and perform an initial separation of the crude oil into several components, including raw light gasoline, raw heavy gasoline, raw jet fuel, raw diesel fuel, gas oil and atmospheric residual.

Atmospheric residual is composed of the heaviest hydrocarbons in crude oil, which boil at the highest temperatures and cannot be further separated at the operating pressures and temperatures in the crude distillation units. For this reason, the atmospheric residual is sent from the crude distillation units to the No. 51 VDU for separation into light gas oil, heavy gas oil and vacuum residual. The No. 51 VDU is called a vacuum unit because it operates at a pressure that is below atmospheric pressure. The reduced pressure allows the atmospheric residual to be distilled at lower temperatures than would be otherwise required if the distillation unit operated at atmospheric pressure.

The existing No. 51 VDU is comprised of several major components, including: 1) a feed surge drum, which receives the atmospheric residual from the crude units; 2) heater feed pumps, which pump the atmospheric residual from the feed surge drum; 3) a feed heater, which heats the atmospheric residual; 4) the vacuum distillation tower (or vacuum tower), which distills the heated atmospheric residual feed; 5) a steam ejector system, which uses steam to generate the vacuum on the distillation tower; 6) product pumps, which transfer products from the vacuum distillation tower to other processing units and storage tanks in the refinery; and 7) heat exchangers, which recover heat from various process streams in the unit to heat other process streams.

The existing No. 51 VDU was built in 1953 and started operations in 1954. Due to its age, the maintenance frequency and costs associated with the No. 51 VDU have increased. There have been a number of maintenance and mechanical integrity issues concerning the No. 51 VDU. For example, the jet ejector condensate pumps in the steam ejector system have required frequent maintenance. The No. 51 VDU was the subject of a notice of violation (NOV) issued by the SCAQMD in May 2004 for "failure to maintain equipment in good operating condition." Additionally, the No. 51 VDU has experienced a number of unscheduled outages in the last 10 years due to the vacuum distillation tower or its internal components losing their mechanical integrity. Specifically, the structure of the vacuum distillation tower is corroded and many portions have undergone multiple repairs because the base metal has been almost completely worn down in places, making any subsequent repairs very difficult. While these existing repairs have performed well up to now, the NOV, the frequency of the repairs, and the difficulty in making additional repairs in the future has prompted BP to propose replacing the vacuum distillation tower.

As part of replacing the vacuum distillation tower, the proposed changes to the No. 51 VDU will also include modifications to the steam ejector system and two light vacuum gas oil pumps and the addition of two new slop oil pumps, two new sour water pumps, a steam flash drum, and a seal drum.

The proposed modifications to the No. 51 VDU will increase the production rate or product yields, primarily by increasing the quantity of higher value products from the same amount of crude oil throughput. The increased efficiency of the proposed modifications to the No. 51 VDU will also improve product yields by allowing a small increase in the feed rate to the unit over the current level. The differences in production rates are shown in **Table 1-1**. As shown in the table, the proposed modifications to the No. 51 VDU will produce more heavy gas oil and less vacuum residual than the existing unit. Also, the proposed modifications to the No. 51 VDU will produce vacuum diesel instead of the light gas oil currently produced by the existing VDU.

Although the proposed modifications to the No. 51 VDU will change product yields from the unit, BP is not increasing refinery crude processing capacity. Additionally, the increased diesel production will decrease the quantity of diesel feed that is currently imported to the refinery for processing, and the decreased gas oil production rate will increase the quantity of gas oil feed imported to the refinery for processing. The increase in the quantity of gas oil that is imported will be equal to the decrease in the quantity of imported diesel feed. Thus, the proposed modifications to the No. 51 VDU will not cause a change in the total quantity of imports to the refinery. Since the total quantity of imports will not change, the changes in diesel and gas oil production associated with the proposed new vacuum distillation tower will not impact downstream units that receive products from the No. 51 VDU.

Table 1-1
Existing and Proposed No. 51 VDU Production Rates

Product	Production Rate (barrels per hour)	
	Existing VDU	**Proposed VDU**
Vacuum Diesel	0	481
Light Gas Oil	337	0
Heavy Gas Oil	1,626	1,974
Vacuum Residual	2,216	1,908
Total	**4,179**	**4,363**

The proposed modifications to the No. 51 VDU will utilize stripping steam to increase the production of gas oil in the unit. Stripping steam is not used in the existing No. 51 VDU. The stripping steam will be condensed to water in the vacuum distillation tower overhead system and the condensed steam will be in contact with a gas stream that contains H_2S, resulting in the formation of sour water. The volume of sour water produced from the stripping steam is anticipated to be 1,380 gallons per hour with a concentration of H_2S at 0.85 percent by weight (8,500 parts per million weight (ppmw)). The increased volume of sour water will be processed by the refinery sour water strippers to remove the H_2S from the sour water. The removed H_2S will then be processed by the refinery sulfur plant, which is approximately 99.9 percent efficient in recovering sulfur. The 0.1 percent of the sulfur that is not recovered by the sulfur plant will be emitted as $SO_{2,}$.

Although the increase in the volume of sour water resulting from the use of stripping steam in the proposed modifications to the No. 51 VDU will cause an increase in the quantity of H_2S to the sulfur plant from the sour water strippers, the total quantity of H_2S produced by the proposed modifications to the No. 51 VDU and processed by the sulfur plant will be the same as the amount produced by the existing No. 51 VDU. An increase in the quantity of H_2S leaving the unit in the sour water will decrease the quantity that leaves the unit in gaseous streams by the same amount. Since the H_2S that leaves the unit in the gaseous streams is subsequently removed from the gaseous streams and then processed by the sulfur plant, the decrease in the quantity of H_2S that leaves the unit in the gaseous streams will balance the increase caused by the increased sour water volume from the unit. Therefore, emissions from the sulfur plant will not change.

The expected increase in the sour water flow rate resulting from the stripping steam can be accommodated within the existing capacity of the refinery's sour water strippers. The existing sour water strippers currently process approximately 1,100 barrels per hour (bph), but they have a demonstrated processing capacity of more than 1,200 bph, which leaves approximately 100 bph of unused capacity. The proposed increase of sour water production to 1,380 gallons-per-hour is equivalent to approximately 33 bph (1,380 gallons per hour / 42 gallons per barrel),

which is less than the unused capacity. Therefore, the proposed increase in the sour water production flow rate will not require modifications to the sour water strippers.

The proposed new vacuum distillation tower will have dimensions different from the existing vacuum distillation tower. The size of the proposed new vacuum distillation tower will be 31 feet-6 inches in diameter at its widest part and 136 feet-6 inches tall while the existing vacuum distillation tower is 30 feet in diameter at its widest part and 88 feet-2 inches tall. BP intends to disconnect and abandon the existing vacuum distillation tower in-place. There are several tall towers with similar profiles that are located within the immediate vicinity of the both the existing and proposed vacuum distillation towers: 1) the No. 1 Crude Unit tower is 137 feet tall and is located approximately 300 feet north of the existing No. 51 VDU; 2) the two dehexanizer towers are each 140 feet tall and are located about 100 feet east of the No. 1 crude tower; 3) the C3 splitter is 259 feet tall and is located approximately 200 feet to the east of the existing No. 51 VDU; 4) the de-ethanizer tower is 122 feet tall and is located next to the C3 splitter; and, 5) an oily water stripper unit equipped with two 65-foot towers is located just west of the existing No. 51 VDU.

Construction of the proposed modifications to the No. 51 VDU will require the demolition of an existing operator shelter building and excavation of this area to pour foundations to support the new equipment. Grading will not be required, because the proposed locations sited for the new equipment are already level.

Construction of the proposed modifications to the No. 51 VDU is scheduled to begin during July 2005 and to be completed during October 2006. Construction activities are expected to require a maximum of approximately 66 workers and an average of 41 workers. Construction activities are anticipated to take place from 6:00 a.m. to 4:30 p.m. Most of the construction will occur four days per week, although work may occur on additional days during some weeks.

Once construction is completed, the modified No. 51 VDU will be operated with existing refinery staffing. The modified No. 51 VDU unit would operate 24 hours per day 365 days per year.

No. 1 Crude Unit Pressure Relief Valve Modifications

When the No. 1 Crude Unit started operations in 1980, the pressure relief valves were designed to discharge to the atmosphere when the internal pressure exceeds the maximum allowable pressure to prevent damage to the equipment. Thus, emissions could be released directly to the atmosphere during a pressure relief event. The emissions from the No. 1 Crude Unit consist of hydrocarbons (vaporized naphtha) mixed with steam and contain less than 25 ppmw of H_2S.

Pressure relief events have occurred occasionally at the refinery in the past. Since late 2002, there have been a total of 13 pressure relief events at the refinery that involved volatile organic compound (VOC) emissions greater than 100 pounds per event. Only one of these pressure relief events involved the No.1 Crude Unit. During that event, which occurred in November 2003, 4,647 pounds of VOC were released. This event was reported to the SCAQMD immediately and documented in a letter dated November 19, 2003.

SCAQMD Rule 1173 requires BP to connect all pressure relief devices (PRD) serving a piece of equipment to a vapor recovery or control system following any release in excess of 2,000 pounds

of VOC in a continuous 24-hour period from any atmospheric PRD serving that piece of equipment, or to pay a mitigation fee. Since the release from the No. 1 Crude Unit during November 2003 exceeded 2,000 pounds, this requirement applies to the No. 1 Crude Unit pressure relief valves. BP is proposing to comply with this requirement by connecting the No. 1 Crude Unit pressure relief valves to a control system, instead of paying a mitigation fee. The proposed new pressure relief valve system will prevent future uncontrolled atmospheric releases of air pollutants due to a pressure build-up in the No. 1 Crude Unit. Rule 1173 requires this connection to a control system to be made no later than the next turnaround for the piece of equipment, which is a time when the equipment is removed from service for maintenance. The next turnaround for the No. 1 Crude Unit is scheduled for November 2006.

Proposed modifications to the No. 1 Crude Unit pressure relief valve system include collecting hydrocarbons that could be released from any pressure relief valve and routing the collected hydrocarbons to the refinery's existing No. 5 Flare. Burning the hydrocarbons in the flare will reduce emissions substantially as compared to the current atmospheric discharges from the pressure relief valves.

Increases in the internal pressures in the No. 1 Crude Unit that would cause pressure relief events do not occur under normal operating conditions. A primary cause of excessive pressure build-up in the No. 1 Crude Unit is the loss of the ability to remove excess heat from the system resulting from a failure in one or more of the cooling systems or in the overhead condenser system. The build-up of excess heat can cause vapor to accumulate, which will increase the internal pressure in the crude tower. Failures that occur due to heat build-up are often the direct result of a failure of a utility system, such as electric power, steam or cooling water.

As part of the proposed modifications, the existing atmospheric pressure relief valves throughout the No.1 Crude Unit will be replaced with new pressure relief valves. The piping from the individual pressure relief valves will be connected to a new pressure relief header, which is a pipe that collects the vapors from individual pressure relief valve piping. The new pressure relief header will send the vapors collected from a release to a new horizontally-mounted flare knockout drum (10 feet in diameter by 20 feet in length), where liquids will be removed or "knocked out" and pumped to an existing storage tank via a new 15 HP pump. The new pressure relief header piping will span the distance from the furthest individual pressure relief valve to the knockout drum. The technique of using a single collection line, or header, avoids the need for long individual lines from each of the individual pressure relief valve outlets to the knockout drum. **Figure 1-5** demonstrates how the new pressure relief valves and header will operate.

After the liquids have been removed, the remaining vapor in the new knockout drum will then flow through an existing 24-inch diameter pressure relief header pipe and eventually through an existing 30-inch diameter pressure relief header approximately 800 feet downstream. The 30-inch diameter pressure relief header will route the vapor to the existing No. 5 Flare system. BP anticipates that the existing No. 5 Flare system capacity is adequate to handle the current pressure relief system flows from the No. 1 Crude Unit plus flows from other sources elsewhere within the refinery. The design capacity of the flare is approximately 956,700 pounds per hour, and the maximum anticipated flow to the flare during a pressure relief event associated with the No. 1 Crude Unit is 762,200 pounds per hour. Thus, the No. 5 Flare system could accommodate an additional flow of 194,500 pounds per hour at the same time as a pressure relief event from the No. 1 Crude Unit.

The last pressure relief event associated with the No.1 Crude Unit was in November 2003, so BP expects that flows to the No. 5 Flare from the No. 1 Crude Unit will be infrequent.

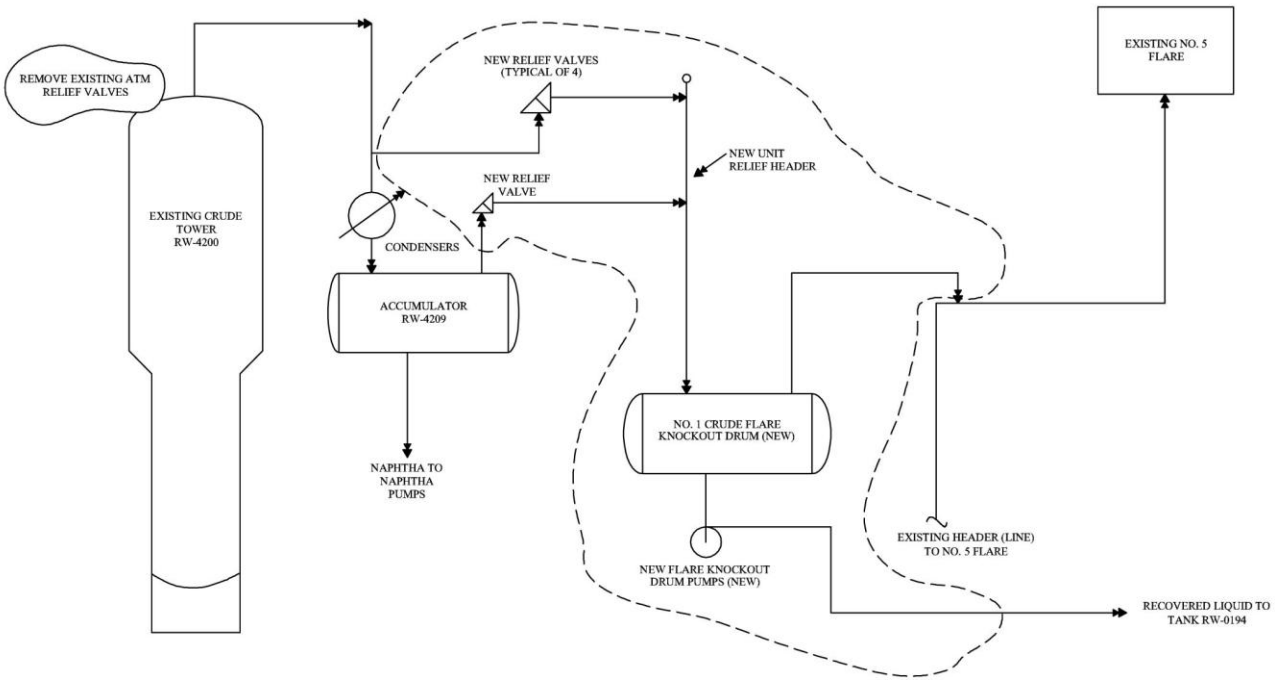

Figure 1-5 No.1 Crude Unit Relief Valves Modifications Flow Sketch

BP is also proposing to reduce the quantity of hydrocarbons that could be routed from the No. 1 Crude Unit to the No. 5 Flare system by changing selected pump drivers (the pump driver is the electric motor or steam turbine that provides the mechanical power to "drive" the pump) and by modifying the power sources for various pumps. Changing the power source of the electric pump motor or steam turbine drivers will reduce the frequency of heat building up if there is a single failure in a utility system that supplies electrical or steam power, or cooling water to the overhead condenser and cooling system. Specifically, BP is proposing to replace the electric motor on the naphtha pump at the crude tower with a new steam turbine. Without this change, a local electrical power failure will result in a loss of pumping power for the cooling system and heat will build up in the No. 1 Crude Unit. However, equipping the naphtha pump with a new steam turbine instead of an electric motor means that the overhead condensing system will not need to rely on electricity since the cooling system will be able to operate continuously and remove heat build-up even during an electrical outage. Actions taken to assure that the naphtha pump is continuously operating and removing heat build-up will also result in less pressure build-up that could cause the pressure relief valves to open. Further, fewer pressure relief events will mean fewer instances where vapors from the No. 1 Crude Unit are sent to the No. 5 flare.

Construction for the proposed modifications to the pressure relief valve system at the No. 1 Crude Unit is scheduled to begin during June 2006 and to be completed during October 2006. Construction activities are expected to require a maximum of approximately 89 workers and an

average of 60 workers. Construction activities are anticipated to take place four days per week from 6:00 a.m. to 4:30 p.m. Once construction is completed, operation of the modified pressure relief valves will not require additional staffing at the refinery.

Butane Tank Car Loading Rack Pressure Relief Valve Modifications

BP also proposes to replace the pressure relief valves on the Butane Unloading Surge Drum, a Low Line Knockout Drum, and a Butane Repressurizing Vaporizer, all of which are located at the Butane Tank Car Loading Rack. The pressure relief valves on the Butane Unloading Surge Drum, Low Line Knockout Drum, and Butane Repressurizing Vaporizer were designed to discharge to the atmosphere when the internal pressure exceeds the maximum allowable pressure to prevent damage to the equipment. Thus, emissions could be released directly to the atmosphere during a pressure relief event. The emissions from the Butane Tank Car Loading Rack consist of hydrocarbons (butane) and contain no toxic air contaminants.

Pressure relief events have occurred occasionally at the refinery in the past. In January 2005, the equipment at the Butane Tank Car Loading Rack experienced a pressure relief event that resulted in a release of VOC that was reported to be as much as 25,900 pounds of VOC. This event was reported to the SCAQMD immediately and documented in a letter dated February 11, 2005. Because this release exceeded 2,000 pounds of VOC, BP is required by SCAQMD Rule 1173 to connect the Butane Tank Car Loading rack pressure relief valves to a control system or to pay a mitigation fee. BP is proposing to comply with this requirement by connecting the Butane Tank Car Loading Rack pressure relief valves to a control system, instead of paying a mitigation fee. The proposed new pressure relief valve system will prevent future uncontrolled atmospheric releases of air pollutants due to a pressure build-up in the Butane Tank Car Loading Rack equipment.

This project component will replace the three relief valves on the Butane Unloading Surge Drum, the Low Line Knockout Drum, and the Butane Repressurizing Vaporizer and route the discharges to the South Area (Coker) Flare. Burning the hydrocarbons in the flare will reduce emissions substantially as compared to the current atmospheric discharges from the pressure relief valves. **Figure 1-6** demonstrates how the new pressure relief valves will operate.

Increases in the internal pressures in the Butane Tank Car Loading Rack equipment that would cause pressure relief events do not occur under normal operating conditions. A primary cause of excessive pressure build-up in the Butane Tank Car Loading Rack equipment would be a process malfunction that causes vapor to accumulate and results in an increase in the internal pressure in the Butane Tank Car Loading Rack equipment.

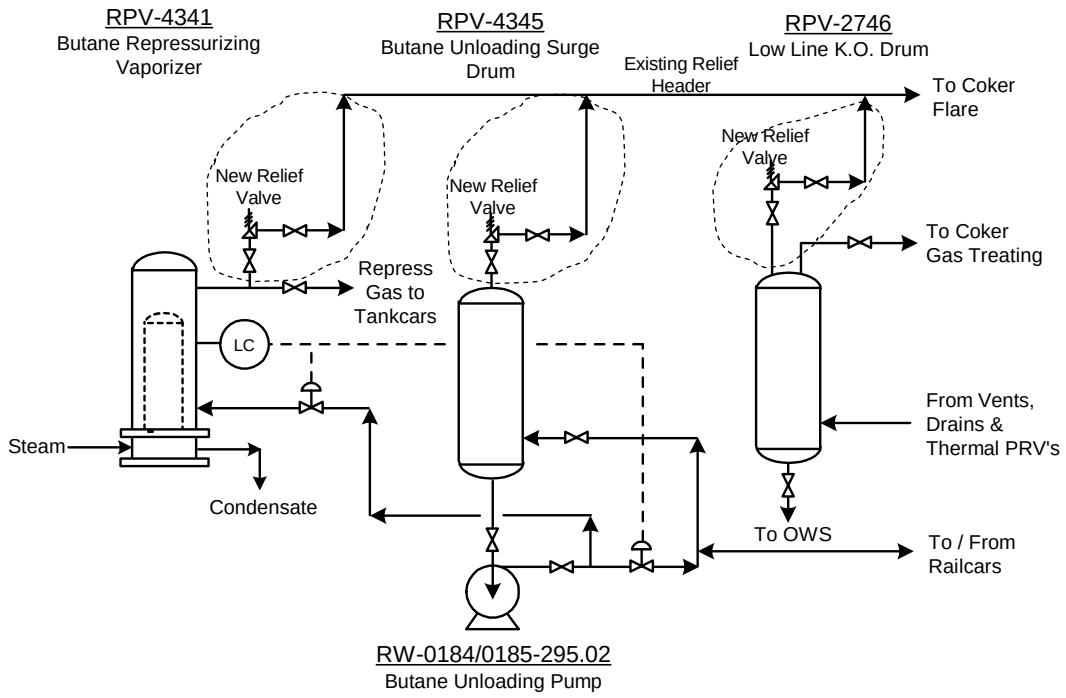

Figure 1-6 Butane Tank Car Loading Rack Modifications Flow Sketch

The pressure relief header will route the vapor to the existing South Area (Coker) Flare system. BP expects that flows to the South Area (Coker) Flare from the Butane Tank Car Loading Rack equipment will be infrequent. BP anticipates that the existing South Area (Coker) Flare system capacity is adequate to handle the current pressure relief system flows from the Butane Tank Car Loading Rack equipment plus flows from other sources elsewhere within the refinery. However, because releases from other equipment sources that vent to the South Area (Coker) flare are also infrequent, and failures that would cause other equipment to vent to the South Area flare would not cause venting from the Butane Tank Car Loading Rack, BP does not anticipate that releases from the other equipment will occur at the same time as releases from the Butane Tank Car Loading Rack.

Construction of the modifications to the pressure relief valve system at the Butane Tank Car Loading Rack is scheduled to begin during August 2006 and to be completed during October 2006. Construction activities are expected to require a maximum of approximately 22 workers and an average of 15 workers. Construction activities are anticipated to take place from 6:00 a.m. to 4:30 p.m. Most of the construction will occur four days per week, although work may occur on additional days during some weeks. Once construction is completed, operation of the modified pressure relief valves will not require additional staffing at the refinery.

Construction Summary for the Proposed Project

Tables 1-2 and **1-3** show peak and average construction manpower levels by month for each of the four components of the proposed project and for the project as a whole. As shown in these tables,

the overall project construction period is expected to begin in July 2005 and end in October 2006, for a total of 16 months. The peak month of the overall project for construction employment is expected to occur in August 2006, where employment would reach 199 workers. August 2006 is also the month when the average construction employment for the overall project would be at its highest level at 165 workers. Average construction employment over the entire 16-month construction period (the average of the monthly employment values shown in **Table 1-3**), is estimated at 82 workers.

Table 1-2
Compliance and Safety Project Peak Construction Manpower by Month

Project Element	Jul 05	Aug 05	Sep 05	Oct 05	Nov 05	Dec 05	Jan 06	Feb 06	Mar 06	Apr 06	May 06	Jun 06	Jul 06	Aug 06	Sep 06	Oct 06
Tank 710	0	14	22	22	22	22	22	34	43	43	43	43	43	22	22	18
No. 51 VDU	33	42	42	42	42	42	66	66	58	58	58	58	66	66	33	26
Crude Unit Valves	0	0	0	0	0	0	0	0	0	0	0	72	72	89	72	54
Butane Valves	0	0	0	0	0	0	0	0	0	0	0	0	0	22	22	11
Total	**33**	**56**	**64**	**64**	**64**	**64**	**88**	**100**	**101**	**101**	**101**	**173**	**181**	**199**	**149**	**109**

Table 1-3
Compliance and Safety Project Average Construction Manpower by Month

Project Element	Jul 05	Aug 05	Sep 05	Oct 05	Nov 05	Dec 06	Jan 06	Feb 06	Mar 06	Apr 06	May 06	Jun 06	Jul 06	Aug 06	Sep 06	Oct 06
Tank 710	0	11	18	18	18	18	18	28	35	35	35	35	35	18	18	15
No. 51 VDU	27	35	35	35	35	35	55	55	48	48	48	48	55	55	27	21
Crude Unit Valves	0	0	0	0	0	0	0	0	0	0	0	60	60	74	60	45
Butane Valves	0	0	0	0	0	0	0	0	0	0	0	0	0	18	18	9
Total[1]	**27**	**46**	**53**	**53**	**53**	**53**	**73**	**83**	**83**	**83**	**83**	**143**	**150**	**165**	**123**	**90**

[1] Average employment over the entire 17-month schedule (the average of the monthly values shown in the TOTAL line of the table) is 85 workers.

Cumulative Projects

CEQA Guidelines §15355 defines "cumulative impacts" as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." The environmental checklist (Appendix G of the CEQA Guidelines) contained in this Initial Study requires consideration of cumulative impacts if they are "cumulatively considerable." According to CEQA Guidelines §15065, "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past

projects, other current projects, and probable future projects. Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," the agency need not consider that effect as significant, but must briefly describe the basis for concluding that the incremental effect is not cumulatively considerable. Chapter 2 of this document evaluates the proposed project and its potential for cumulative impacts for each of the various topic areas included in the Environmental Checklist.

One other project has been identified at or near the Carson Refinery with the potential for cumulative impacts in conjunction with the proposed project. This cumulative project, referred to herein as the Methyl Tertiary Butyl Ether (MTBE)/Iso-octene conversion project, is also located at the Carson Refinery and involves the proposed conversion of the existing MTBE Unit at the refinery to a unit that produces iso-octene. The MTBE/Iso-octene conversion involves modifying one reactor and adding one new reactor at the refinery; modifying two existing distillation columns, one surge vessel, and three heat exchangers; and removing and installing a number of pumps.

The MTBE/Iso-octene conversion was originally part of the CARB Phase 3/MTBE Phase-out project that was evaluated in the May 2001 Final Environmental Impact Report (EIR) for the Proposed ARCO California Air Resources Board (CARB) Phase 3/MTBE Phase-out Project (SCAQMD 2001). However, as construction of the initial phases of the overall CARB Phase 3/MTBE Phase-out project was underway, additional engineering and process designs specific to the MTBE Unit provided a preferable, but different technology for producing iso-octene than had been contemplated at the time of the May 2001 Final EIR. Thus, changes to the original proposal for the MTBE/Iso-octene conversion were proposed in an Addendum to the May 2001 Final EIR. The proposed MTBE conversion was addressed in the April 2005 Addendum to the Final Environmental Impact Report for the BP Carson Refinery (formerly ARCO Los Angeles Refinery) CARB Phase 3/MTBE Phase-out Project (SCAQMD, April 2005). Construction of the proposed MTBE/Iso-octene conversion started in April 2005 and is expected to be completed in October 2005.

Construction Summary for the Cumulative Projects

Tables 1-4 and **1-5** show peak and average construction manpower levels by month for each of the four components of the proposed project plus the MTBE/Iso-octene conversion during the construction period for the MTBE/Iso-octene conversion. As shown in these tables, the construction period for the MTBE/Iso-octene conversion began in April 2005 and is scheduled to end in October 2005. Construction of the MTBE/Iso-octene conversion overlaps with the currently proposed project for a total of four months, from July through October, 2005. For cumulative projects, the peak month of the proposed project plus the MTBE/Iso-octene conversion for construction employment is expected to occur in September 2005, when the total peak employment and average employment are anticipated to be 129 and 107 workers, respectively.

Table 1-4
Cumulative Projects Peak Construction Manpower by Month

Project Element	Apr-05	May-05	Jun 05	Jul 05	Aug 05	Sep 05	Oct 05
Tank 710	0	0	0	0	14	22	22
No. 51 VDU	0	0	0	33	42	42	42
Crude Unit Valves	0	0	0	0	0	0	0
Butane Valves	0	0	0	0	0	0	0
MTBE/Iso-Octene[a]	10	15	20	36	44	65	36
TOTAL	**10**	**15**	**20**	**69**	**100**	**129**	**100**

Note: Table only shows months during construction to convert the MTBE Unit to an Iso-octene Unit.

[a] Construction to convert the MTBE Unit to an Iso-octene Unit started in April 2005 and is scheduled to end in October 2005.
Source: Appendix C.1, Table 20 of the April 2005 Addendum to the May 2001 Final EIR for BP CARB Phase 3/MTBE Phase-out Project, which lists peak daily number of off-site worker commute vehicles during each construction month. One construction worker occupies each vehicle.

Table 1-5
Cumulative Projects Average Construction Manpower by Month

Project Element	Apr-05	May-05	Jun 05	Jul 05	Aug 05	Sep 05	Oct 05
Tank 710.	0	0	0	0	11	18	18
No. 51 VDU	0	0	0	27	35	35	35
Crude Unit Valves	0	0	0	0	0	0	0
Butane Valves	0	0	0	0	0	0	0
MTBE/Iso-Octene	8	12	16	30	36	54	30
TOTAL	**8**	**12**	**16**	**57**	**82**	**107**	**83**

Note: Table only shows months during construction to convert the MTBE Unit to an Iso-octene Unit.

[a] Construction to convert the MTBE Unit to an Iso-octene Unit started in April 2005 and is scheduled to end in October 2005.
Source: Appendix C.1, Table 20 of the April 2005 Addendum to the May 2001 Final EIR for BP CARB Phase 3/MTBE Phase-out Project, which lists peak daily number of off-site worker commute vehicles during each construction month. One construction worker occupies each vehicle. BP's engineering contractor estimated that peak monthly workforce is 20 percent higher than average monthly workforce. Therefore, peak manpower from Table 1-4 was divided by 1.2 to estimate average manpower.

CHAPTER 2 - ENVIRONMENTAL CHECKLIST

Introduction

General Information

Environmental Factors Potentially Affected

Determination

Environmental Checklist and Discussion

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Project Title:	BP Carson Refinery Compliance and Safety Project
Lead Agency Name:	South Coast Air Quality Management District
Lead Agency Address:	21865 Copley Drive, Diamond Bar, CA 91765
CEQA Contact Person and Phone Number:	Ms. Barbara Radlein (909) 396-2716
Project Sponsor's Name:	BP West Coast Products, LLC (BP)
Project Sponsor's Address:	1801 E. Sepulveda Boulevard, Carson, CA 90749
Project Sponsor's Contact Person and Phone Number:	Ms. Sheryl Wood (310) 816-8527
General Plan Designation:	Heavy Industrial
Zoning:	MH (Manufacturing, Heavy)
Description of Project:	BP proposes four modifications to the Carson Refinery: 1) replace an existing sour water surge tank with a new spherical surge tank designed to avoid direct venting to the atmosphere when internal pressures build up in the tank; 2) replace several components of the existing No. 51 Vacuum Distillation Unit in order to reduce maintenance requirements and unplanned outages; 3) modify the pressure relief valve system at the No. 1 Crude Unit to control emissions when excessive internal pressures build up in equipment at the unit; and 4) modify the pressure relief valve system at the Butane Tank Car Loading Rack to control emissions when excessive internal pressures build up in equipment at the unit.
Surrounding Land Uses and Setting:	Land uses surrounding the Carson Refinery are largely heavy manufacturing with the exception of an area of mixed light manufacturing, residential and commercial uses to the northwest across E. 223rd Street, and an area of mixed residential and light manufacturing uses to the southwest.
Other Public Agencies Whose Approval is Required:	None

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed project. Any checked items represent areas that may be adversely affected by the proposed project. An explanation relative to the determination of impacts can be found following the checklist for each area.

☐	Aesthetics	☐	Geology and Soils	☐	Population and Housing
☐	Agricultural Resources	☐	Hazards and Hazardous Materials	☐	Public Services
☑	Air Quality	☐	Hydrology and Water Quality	☐	Recreation
☐	Biological Resources	☐	Land Use and Planning	☐	Solid/Hazardous Waste
☐	Cultural Resources	☐	Mineral Resources	☑	Transportation./Traffic
☐	Energy	☐	Noise	☐	Mandatory Findings

DETERMINATION

On the basis of this initial evaluation:

☐ I find the proposed project, COULD NOT have a significant effect on the environment, and that a NEGATIVE DECLARATION will be prepared.

☑ I find that although the proposed project could have a significant effect on the environment, there will not be significant effects in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL IMPACT REPORT will be prepared.

☐ I find that the proposed project MAY have a "potentially significant impact" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Date: May 24, 2005 Signature: Steve Smith

Steve Smith, Ph.D.
Program Supervisor– CEQA
Planning, Rule Development, and
Area Sources

ENVIRONMENTAL CHECKLIST AND DISCUSSION

		Potentially Significant Impact	Less Than Significant Impact	No Impact
I.	**AESTHETICS.** Would the project:			
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☑
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☑
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☑	☐
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☑

Significance Criteria

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

- The proposed project will block views from a scenic highway or corridor.
- The proposed project will adversely affect the visual continuity of the surrounding area.
- The proposed project adds lighting which would add glare to residential areas or sensitive receptors.

Environmental Setting and Impacts

I.a), b) & c) Since there are no scenic vistas or resources at or in the vicinity of the refinery, the proposed project will have no adverse impacts on scenic vistas or resources.

All project activities will take place within the boundaries of the existing refinery. The new refinery equipment to be installed as part of the proposed project will be similar in size, appearance, and profile to the existing facilities and equipment at the Carson Refinery.

Specifically, the new spherical sour water surge tank will be taller than the existing fixed roof sour water surge tank (Tank 710) it will replace (roughly 76 feet for the new tank versus 48 feet for the existing tank), but smaller in diameter (76 feet for the new tank versus 90 feet for the existing tank). The surge capacity of the new spherical sour water surge tank will be smaller than the capacity of the existing Tank 710 (40,600 bbl for the new tank versus 55,000 bbl for the existing tank).

The proposed new vacuum distillation tower will have dimensions that are different from the existing vacuum distillation tower at the No. 51 VDU. The new vacuum distillation tower will be

31 feet-6 inches in diameter at its widest part and 136 feet-6 inches tall while the existing vacuum distillation tower is 30 feet in diameter at its widest part and 88 feet-2 inches tall. BP intends to disconnect and abandon the existing vacuum distillation tower in-place. However, there are several tall towers with similar profiles that are located within the immediate vicinity of both the existing and proposed vacuum distillation towers: 1) the No. 1 Crude Unit tower is 137 feet tall and is located approximately 300 feet north of the existing No. 51 VDU; 2) the two dehexanizer towers are each 140 feet tall and are located next to the No. 1 crude tower; 3) the C3 splitter is 259 feet tall and is located approximately 200 feet to the east of the existing No. 51 VDU; 4) the de-ethanizer tower is 122 feet tall and is located next to the C3 splitter; and, 5) an oily water stripper unit equipped with two 65-foot towers is located just west of the existing No. 51 VDU.

The proposed modifications to the No. 1 Crude Unit pressure relief valves will also include the installation of a new flare knockout drum (10 feet in diameter and 20 feet long), a new pump, and a new pressure relief header at the No. 1 Crude Unit (24 inches in diameter). The proposed new equipment at this location will be similar in size, appearance, and profile to the existing equipment.

The proposed modifications to the Butane Tank Car Loading Rack pressure relief valves will include the replacement of pressure relief valves on a butane unloading surge drum, knockout drum, and a repressuring vaporizer at the Butane Tank Car Loading Rack area and the installation of piping between these pressure relief valves and the Coker Flare header. The proposed new equipment at this location will be similar in size, appearance, and profile as compared to the existing equipment.

The refinery site is zoned by the City of Carson as MH (Manufacturing Heavy). Zoning surrounding the refinery also is largely MH except for a mixture of light manufacturing, residential, and general commercial to the northwest of the refinery across East 223rd Street, and residential and light manufacturing uses to the southwest of the refinery. Because of its height, the upper portion of the new vacuum distillation tower is expected to be visible from the mixed residential and light manufacturing area located southwest of the refinery. However, the new vacuum distillation tower will be visually indistinguishable from the numerous other tall towers that exist in the immediate vicinity of the tower and elsewhere in the refinery. City of Carson Municipal Code (CMC) Section 9146.12 Height of Buildings and Structures, indicates that there are no height limitations in industrial zones as long as additional yardage spaces are provided as required in CMC Section 9146.21-9146.29. The proposed project does not conflict with the yardage requirements of the applicable sections of the CMC and, thus, the proposed project is consistent with the City of Carson's building and structure height requirements.

Because of the physical similarity of the new equipment associated with the proposed project relative to the existing equipment being upgraded or replaced, and because the new equipment will be located in areas of the refinery that already contain numerous and similar existing pieces of large refinery equipment, the structures that will be constructed as part of the proposed project are expected to have less-than-significant impacts on the existing visual character or quality of the refinery site and its surroundings. No substantial degradation of visual resources is expected.

I.d) There will be minimal additional permanent light sources required as part of the proposed project. New lighting that will be installed on the proposed equipment will be consistent in

intensity and type with the existing lighting on equipment and other structures at the refinery that are being replaced or modified. Construction activities associated with the proposed project are planned to occur during daylight hours, which will eliminate the need for additional night lighting. If the construction schedule is modified to occur during the nighttime, temporary lighting might be required and would depend on the existing light sources available on or near the construction. Since the location of the proposed construction activities will occur completely within the boundaries of the existing refinery, if any additional temporary lighting is needed, it is not expected to be discernible from the existing lighting. No significant impacts to light and glare are anticipated from the proposed project.

Mitigation Measures

Based upon these considerations, significant adverse aesthetic impacts are not anticipated. Since no significant aesthetic impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
II.	**AGRICULTURE RESOURCES.** Would the project:			
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☑
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☑
c)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☑

Significance Criteria

Project-related impacts on agricultural resources would be considered significant if any of the following conditions are met:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.

– The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural uses.

Environmental Setting and Impacts

II.a) The proposed project involves modifications within the confines of an existing refinery that are consistent with heavy industrial zoning. No agricultural resources exist in the vicinity of the refinery and no new land will be acquired as part of the proposed project. Further, the proposed project will not convert Farmland (as defined above) to non-agricultural use or involve other changes in the existing environment that could convert Farmland to non-agricultural use.

II.b) & c) Land in the vicinity of the refinery is not currently zoned for agricultural use. The proposed project does not conflict with an existing agricultural zone or Williamson Act contracts and does not include converting agricultural land for non-agricultural uses.

Mitigation Measures

Based upon these considerations, significant adverse agriculture resources impacts are not anticipated. Since no significant agriculture resource impacts were identified, no mitigation measures are required or necessary.

		Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
III.	**AIR QUALITY** Would the project:			
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☑
b)	Violate any air quality standard or contribute to an existing or projected air quality violation?	☐	☑	☐
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☑	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☑	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☑	☐
f)	Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s)?	☐	☐	☑

Significance Criteria

Project-related air quality impacts will be considered significant if:

- The project causes any of the applicable SCAQMD significance thresholds in Tables 2-1 and 2-2 to be equaled or exceeded.

Environmental Setting and Impacts

The Carson Refinery is located within the SCAQMD's jurisdiction (also referred to as the district). The district consists of the four-county South Coast Air Basin (Basin) which includes Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties, plus the Riverside County portions of the Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of the district, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. The Riverside County portions of the SSAB and MDAB are bounded by the San Jacinto Mountains in the west and span eastward to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of Riverside County and the SSAB that is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east.

Air quality is determined primarily by the type and amount of contaminants emitted into the atmosphere, the size and topography of the air basin, and the meteorological conditions within the air basin. The district has low mixing heights and light winds, which are conducive to the accumulation of air pollutants. Pollutants that impact air quality are generally divided into two categories: criteria pollutants (those for which health-based ambient standards have been set) and toxic air contaminants (those that cause cancer or have adverse human health effects other than cancer).

Health-based air quality standards have been established by California and the federal government 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. These standards were established to protect sensitive receptors from adverse health impacts due to exposure to air pollution. California Ambient Air Quality Standards (CAAQS) are generally more stringent than the federal National Ambient Air Quality Standards (NAAQS). California has also established standards for sulfate, visibility reducing particles, H_2S and vinyl chloride. However, H_2S and vinyl chloride are currently not monitored in the district.

The BP Carson Refinery is located within the Long Beach monitoring area of the district. Background air quality data for criteria pollutants for the Long Beach monitoring station for the period from 1999 through 2003 (SCAQMD, 2003; CARB, 2004) were compared to the more stringent of either the CAAQS or NAAQS, which was the CAAQS in all cases. These monitored data indicate the Long Beach area is in compliance with the both the CAAQS and NAAQS for CO, NO_2, SO_2, and lead.

The State one-hour average O_3 air quality standard was exceeded on three days each during 1999 and 2000 and on one day during 2003. The federal one-hour O_3 standard was exceeded on one day during 1999, and the federal 8-hour O_3 standard was never exceeded from 1999 through 2003. The state PM10 standard was exceeded at the Long Beach air monitoring station on several days each year. The national PM10 standards were met in all years, but the national PM2.5 standards were exceeded every year. The State sulfate standard was exceeded on one day during 2000.

One of the primary health risks of concern due to exposure to toxic air contaminants (TACs) is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens (i.e., any exposure to a carcinogen poses some risk of causing cancer).

Unlike carcinogens, for most noncarcinogens it is believed that there is a threshold level of exposure to the compound below which it will not pose a health risk. The California Environmental Protection Agency (CalEPA) and Office of Environmental Health Hazard Assessment (OEHHA) develop reference exposure levels (RELs) for TACs that are at or below levels for which health effects are not expected. The noncancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index (HI).

In the MATES II study, SCAQMD monitored more than 30 toxic air pollutants at 24 sites over a one-year period in 1999. The SCAQMD collected more than 4,500 air samples and together with the California Air Resources Board (CARB) performed more than 45,000 separate laboratory analyses of these samples. A similar study known as MATES I was conducted in 1986 and 1987. In each study, SCAQMD calculated cancer risk assuming 70 years of continuous exposure to monitored levels of pollutants.

The MATES II study found that the average carcinogenic risk throughout the Basin is about 1,400 in one million ($1{,}400 \times 10^{-6}$). Mobile sources (e.g., cars, trucks, trains, ships, aircraft, etc.) represent the greatest contributors. About 70 percent of the risk is attributed to diesel particulate emissions; about 20 percent is attributed to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde); and about 10 percent is attributed to stationary sources (which include industries and other certain businesses such as dry cleaners and chrome plating operations.)

III.a) The 2003 Air Quality Management Plan (AQMP) demonstrates that the applicable ambient air quality standards can be achieved within the timeframes required under federal law. Growth projections from local general plans adopted by cities in the district are some of the inputs used to develop the AQMP. As indicated in the Population and Housing and Transportation/Traffic sections, the proposed project will not require additional refinery employees or generate additional traffic during operation. Therefore, the proposed project will not cause increases in the growth projections in the City of Carson General Plan. Additionally, this project must comply with applicable SCAQMD requirements and control measures for new or modified sources. For example, new emission sources associated with the proposed project are required to comply with the SCAQMD's Regulation XIII - New Source Review requirements that include the use of Best

Available Control Technology (BACT). It must also comply with prohibitory rules, such as Rule 403, for the control of fugitive dust. By meeting these requirements, the project will be consistent with the goals and objectives of the AQMP.

III.b) Air quality impacts of the proposed project will be considered significant if the thresholds in **Table 2-1** are exceeded.

Table 2-1
SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NO_x	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
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 (TACs) and Odor Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment) Hazard Index ≥ 3.0 (facility-wide)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants [a]		
NO_2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (state) 0.053 ppm (federal)	
PM10 24-hour average annual geometric average annual arithmetic mean	 10.4 μg/m^3 (recommended for construction) [b] 2.5 μg/m^3 (operation) 1.0 μg/m^3 20 μg/m^3	
Sulfate 24-hour average	 1 μg/m^3	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) 9.0 ppm (state/federal)	

[a] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[b] Ambient air quality threshold based on SCAQMD Rule 403.
KEY: lbs/day = pounds per day; ppm = parts per million; μg/m^3 = microgram per cubic meter; ≥ greater than or equal to

Subsequent to the adoption of the SCAQMD CEQA Air Quality Handbook (SCAQMD, 1993), the SCAQMD adopted the Regional Clean Air Incentive Market (RECLAIM) program, fundamentally changing the framework of air quality rules and permits that apply to the largest NO_x and SO_x sources within the district. The RECLAIM program is a pollution credit trading program for large sources of NO_x and SO_x emissions within the jurisdiction of the SCAQMD. Companies within the program are given an emissions allocation that reflects historical usage, but that declines yearly to

reduce total emissions from the program. Facilities are allowed to buy and sell credits, reflecting the facilities' emissions for the year. The emissions from the universe of RECLAIM sources were capped in 1994. The emissions cap declined each year from 1995 to 2003, and is now fixed at a level of approximately 78 percent below the initial levels. As implementation of the RECLAIM program proceeded, the SCAQMD realized that it needed to examine how to apply the CEQA significance thresholds to RECLAIM facilities, recognizing that CEQA case law directs that the existing environmental setting includes permits and approvals that entitle operators to conduct or continue certain activities. The SCAQMD determined that the baseline should be the RECLAIM initial allocation for each RECLAIM facility, and that a project would be considered significant if the proposed project would cause the facility's emissions to exceed the baseline plus the adopted significance threshold.

Under the RECLAIM program, the SCAQMD issues facility-wide permits to sources. The facility permits specify an initial allocation and annual emission allocations for NO_x and SO_x. The initial allocations were based on historical reported emissions for the years immediately prior to implementation of the RECLAIM program. Annual allocations represent the number of RECLAIM Trading Credits (RTCs) the facilities begin with each year. The allocations generally declined each year from 1994 through 2003. Operators of RECLAIM sources must not emit more than the total number of RECLAIM credits they possess, which include the annual allocation plus any credits bought and minus any credits sold. In this way, the RECLAIM permit process operates to reduce on an annual basis the overall emissions of NO_x and SO_x in the Basin, while providing flexibility at individual facilities to vary emissions up to the levels of the actual emissions as determined in 1994. Facilities reduce emissions through a variety of ways including curtailing production and installing pollution control equipment, to remain below annual allocations. Facilities in the program can generate credits to sell by reducing their emissions beyond their annual allocation. Although the allocations for RECLAIM facilities have declined each year since 1994, the maximum annual emissions of NO_x and SO_x permitted from each facility remain at the 1994 limits - so long as that facility acquires additional allocations ("trading credits") from another RECLAIM facility that has reduced its emissions below its current-year allocation.

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

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

Where:

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

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

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

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

The above analysis provides a way of applying the standard CEQA significance thresholds to the facilities that have CEQA baselines that are determined by the unique permitting program of RECLAIM. The analysis ensures that the CEQA significance criteria are applied properly and fairly, taking into account the unique aspects of the RECLAIM permit program. For localized impacts associated with a physical modification, the RECLAIM regulations require modeling and establish thresholds that cannot be exceeded.

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

Table 2-2
Determining Significance for RECLAIM Pollutants at the Carson Refinery

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

[a] Includes non-tradeable credits

The use of the RECLAIM CEQA NO_x and SO_x significance criteria to determine the significance of air quality impacts from stationary sources subject to RECLAIM at the Carson Refinery is appropriate because the refinery is a RECLAIM facility.

The proposed projects will commence operations in November 2006. RECLAIM allocations generally apply to 12-month periods. For the BP Carson Refinery, this 12-month period is from July 1 through June 30. Therefore, NO_x and SO_x RECLAIM allocations for the period from July 2006 through June 2007 for the BP refinery were used in determining the significance of operational air quality impacts from RECLAIM sources for the proposed project. The 2006/2007 allocations for NO_x and SO_x are 1,483,062 lb/yr (4,063 lb/day) and 854,339 lb/yr (2,341 lb/day),

respectively. Therefore, emission increases up to $[(A_1 / 365 + I)_{NOx} - A_{2,NOx} / 365]$ = (10,211 lb/day - 4,063 lb/day) = 6,148 lb/day of NO_x and $[(A_1 / 365 + I)_{SOx} - A_{2,SOx} / 365]$ = (10,294 lb/day - 2,341 lb/day) = 7,953 lb/day of SO_x for the proposed projects would be less than significant.

Construction Criteria Pollutant Emissions

Construction emissions can be distinguished as either on-site or off-site. On-site emissions generated during proposed project construction consist of the following:

- Exhaust emissions (CO, VOC, NO_X, SO_X, and PM10) from heavy-duty construction equipment;
- Fugitive dust (PM10) from excavation, motor vehicle travel on paved surfaces, storage pile wind erosion, and general material handling (i.e., dropping soil onto the ground during excavation);
- VOC from architectural coating; and
- VOC from asphaltic paving.

Off-site emissions during the construction phase consist of exhaust emissions and entrained paved road dust from worker commute trips and material delivery trips to the construction site.

Construction activities associated with the proposed replacement of Tank 710 will include demolishing the existing sour water surge Tank 710 and its foundation, excavating and constructing the foundation in preparation for installing the new sour water spherical tank, erecting the new tank, painting the new tank, and connecting the piping and instrumentation to the new tank. These activities are scheduled to occur over a 15-month period from August 2005 through October 2006. It should be noted that the existing Tank 710 has been emptied through Tank 774 and cleaned during normal refinery maintenance.

Construction activities associated with the modifications to the No. 51 VDU will include demolishing the existing operator shelter building, paving a currently unpaved area, excavating and constructing a foundation in preparation for installing the new vacuum distillation tower, installing the new tower, and connecting the piping and instrumentation to the new tower. These activities are scheduled to occur over a 16-month period beginning in July 2005 and ending in October 2006. The existing vacuum distillation tower will be "abandoned in place," which means that it will be disconnected, but not be removed from its current location.

Construction activities associated with the proposed modifications to the No. 1 Crude Unit pressure relief valves will include excavating and installing foundations for the new knockout drum and piping, installing the new knockout drum, piping and relief valves, and painting all of the new equipment. These activities are scheduled to occur over a five-month period, beginning in June 2006 and ending in October 2006.

Construction activities associated with the proposed modifications to the Butane Tank Car Loading Rack pressure relief valves will include installing foundations for new piping to connect the new

pressure relief valves to the existing pressure relief header for the existing South Area (Coker) Flare system, replacing the three existing pressure relief valves with new valves, installing the piping, and painting the piping. Installing the pipe foundations will not require excavation. These activities are scheduled to occur over a three-month period, beginning in August 2006 and ending in October 2006.

Emissions from these construction activities were estimated by using the following emission estimating techniques:

- SCAQMD CEQA Air Quality Handbook, November 1993;
- California Air Resources Board EMFAC2002 on-road motor vehicle emission factor model;
- California Air Resources Board OFFROAD off-road mobile source emission factor model;
- California Air Resources Board Emission Inventory Methodology 7.9, Entrained Paved Road Dust, 1997; and
- "Open Fugitive Dust PM10 Control Strategies Study," Midwest Research Institute, October 12, 1990.

To estimate the peak daily emissions associated with construction equipment exhaust, the anticipated schedule and the types and numbers of construction equipment were estimated by BP's engineering contractor. Specific information included:

- Types of construction equipment;
- Equipment horsepower ratings;
- Number of each type of equipment; and
- Operating hours per day.

These estimates were provided for each construction month for each component of the proposed project.

Additionally, estimates of emissions from motor vehicles were derived from the number and length of daily worker commuting trips and material delivery and removal trips, as well as from daily mileage for on-site motor vehicles. These estimates were conducted for each construction month for each component of the proposed project.

BP's engineering contractor also estimated the quantities of soil that will be excavated in order to estimate peak on-site fugitive PM10 emissions from material handling:

- Construction of the foundation for the new sour water spherical tank (new Tank 710) is anticipated to require the excavation and backfill of 3,850 cubic yards of soil over a two-month period (between October and November 2005). For a conservative estimate, the entire volume of soil to be handled (3,850 cubic yards excavated + 3,850 cubic yards backfilled = 7,700 cubic yards) is assumed to be handled on any single day during these two months.

- Construction of the foundation for the new No. 51 VDU is anticipated to require the excavation and backfill of 2,100 cubic yards of soil over a three-month period (from July through September 2005). For a conservative estimate, the entire volume of soil to be handled (2,100 cubic yards excavated + 2,100 cubic yards backfilled = 4,200 cubic yards) is assumed to be excavated on any single day during this three-month period.

- Construction of the foundations for the new knockout drum and piping for the No. 1 Crude Unit pressure relief valve modifications is anticipated to require the excavation and backfill of 11 cubic yards of soil over a one-month period (June 2006). For a conservative estimate, the entire quantity of soil to be handled (11 cubic yards excavated + 11 cubic yards backfilled = 22 cubic yards) is assumed to be excavated on any single day.

- The excavated soil will be loaded directly onto trucks for disposition, thereby eliminating fugitive PM10 emissions due to wind erosion of temporary stockpiles.

Active disturbed areas will be watered twice per day to comply with SCAQMD Rule 403 - Fugitive Dust, which will reduce fugitive PM10 emissions by 50 percent.

To estimate VOC emissions from architectural coatings due to painting, BP's engineering contractor estimated that the following quantities of a zinc-rich industrial maintenance primer, at a maximum of 2.83 pounds of VOC per gallon, which is the VOC limit specified by SCAQMD Rule 1113 for zinc-rich industrial maintenance primers, would be applied without a top coat:

- The materials used to construct the new spherical sour water Tank 710 will be painted prior to delivery to the refinery. However, a total of 20 gallons of zinc-rich primer will be used over a two-month period (July and August, 2006), at a maximum daily usage of 1.2 gallons per day, to paint weld seams and for touchup at the refinery after the tank is erected;

- The new vacuum distillation tower for the proposed modifications to the No. 51 VDU will be insulated and will not be painted. However, 20 gallons of zinc-rich primer will be used to paint weld seams and for touchup during an 11-month period (December 2005 through October, 2006) at a maximum daily usage of two gallons per day;

- A total of 150 gallons of zinc-rich primer to paint the new piping for the proposed modifications to the No. 1 Crude Unit pressure relief valves during five months (June through October, 2006) at a maximum daily usage of five gallons per day; and

- A total of 21 gallons of zinc-rich primer to paint the new piping for the proposed modifications to the Butane Tank Car Loading Rack pressure relief valves during three months (August through October, 2006) at a maximum daily usage of two gallons per day.

A total of 55 square yards of asphaltic paving would be required as part of the construction of the proposed new No. 51 VDU over a two-month period (August and September 2005) at a maximum of 28 square yards paved on any single day during this two-month period.

These estimates of construction equipment and motor vehicle usage, excavation quantities, architectural coating usage and asphaltic paving were used to calculate the daily criteria pollutant emissions associated with constructing each of the four components of the proposed project during each month of construction. Daily emissions associated with constructing all four components of the proposed project during each construction month, were added together to calculate the total daily emissions during each construction month. These total daily criteria pollutant emissions are listed by month in **Table 2-3**. As shown in **Table 2-3**, peak daily CO, VOC and PM10 emissions are anticipated to occur during August 2006, and peak daily NO_x and SO_x emissions are anticipated to occur during November 2005. Details of these calculations are presented in **Appendix A**.

Table 2-3
Daily Construction Emissions per Month (lb/day)[a]

Pollutant	**Month/Year**							
	07/05	**08/05**	**09/05**	**10/05**	**11/05**	**12/05**	**01/06**	**02/06**
CO	41.8	48.6	52.8	54.7	62.8	60.3	67.5	71.1
VOC	8.1	8.7	8.7	9.1	11.2	15.7	17.3	17.6
NO_x	66.5	56.7	65.6	66.6	**91.8**	84.9	78.9	76.5
SO_x	9.2	7.3	10.4	8.9	**12.6**	12.1	11.5	10.5
PM10	8.5	9.7	10.2	11.7	12.9	8.4	9.2	9.6
Pollutant	**Month/Year**							
	03/06	**04/06**	**05/06**	**06/06**	**07/06**	**08/06**	**09/06**	**10/06**
CO	74.7	69.7	71.4	113.9	114.4	**126.1**	103.7	77.7
VOC	18.6	17.7	18.2	38.7	41.5	**49.0**	43.4	39.1
NO_x	81.0	67.8	63.6	86.5	79.8	83.9	84.8	60.1
SO_x	11.4	9.5	8.9	10.8	10.0	9.6	10.5	7.3
PM10	10.4	9.9	10.4	15.7	14.8	**16.6**	14.8	10.8

[a] Emissions in **bold** are peak daily emissions

BP has also estimated that up to 50 percent of the excavated soil may be contaminated and require off-site disposal. Contaminated soil will be stored in a temporary location at the refinery and hauled to a disposal site approximately 35 miles from the refinery on weekends, when no other construction activities are occurring. A maximum of 10 haul truck trips would occur on a single day. Additionally, a front-end loader would also operate up to eight hours per day to load contaminated soil into the trucks. Daily CO, VOC, NO_x, SO_x and PM10 emissions from loading the haul trucks and transporting the contaminated soil to the disposal site would be 7.7 lb/day, 4.3 lb/day, 32.3 lb/day, 3.6 lb/day, and 4.6 lb/day, respectively, as presented in Appendix A. These daily emissions are less than the peak daily emissions in **Table 2-3**. Thus, emissions from hauling contaminated soils off-site for disposal on weekends will not contribute to peak daily construction emissions.

Peak daily construction emissions are summarized in **Table 2-4**, along with the CEQA significance level for each pollutant. The daily emissions from construction equipment, on-site motor vehicles, on-site fugitive PM10 emissions, architectural coatings, asphaltic paving, and off-site motor vehicles during the month when peak daily emissions of each pollutant will occur are also listed in the table. The table shows that none of the significance levels is anticipated to be exceeded. Therefore, construction activities associated with the proposed project are not anticipated to cause significant adverse air quality impacts for criteria pollutants.

Table 2-4
Peak Daily Construction Emissions Summary

Source	CO (lb/day)[a]	VOC (lb/day)[a]	NO_X (lb/day)[a]	SO_X (lb/day)[a]	PM10 (lb/day)[a]
Construction Equipment	31.4	9.9	80.8	12.5	6.2
On-Site Motor Vehicles	3.6	0.4	1.6	0.0	4.7
On-Site Fugitive PM10[b]	N/A	N/A	N/A	N/A	0.0
Architectural Coating	N/A	28.9	N/A	N/A	N/A
Asphaltic Paving[c]	N/A	0.0	N/A	N/A	N/A
Total On-Site	**35.0**	**39.2**	**82.4**	**12.5**	**10.9**
Off-Site Motor Vehicles	**91.1**	**9.8**	**9.4**	**0.1**	**5.7**
TOTAL	**126.1**	**49.0**	**91.8**	**12.6**	**16.6**
CEQA Significance Level	*550*	*75*	*100*	*150*	*150*
Significant? (Yes/No)	No	No	No	No	No

[a] Peak daily CO, VOC and PM10 emissions are anticipated to occur during August 2006, and peak daily NO_x and SO_x emissions are anticipated to occur during November 2005.

[b] Excavation, which is the source of fugitive PM10 emissions, is not scheduled to occur during August 2006, which is the month when the peak daily PM10 emissions occur.

[c] Asphaltic paving is not scheduled to occur during August 2006, which is the month when the peak daily VOC emissions occur.

N/A = Pollutant not emitted by this source. On-site fugitive PM10 emissions consist only of PM10. Emissions from architectural coating and asphaltic paving consist only of VOC.

Note: Sums of individual values may not equal totals because of rounding.

Operational Criteria Pollutant Emissions

The proposed replacement of the existing sour water tank and the vacuum distillation tower in the No. 51 VDU and the proposed modifications to the No. 1 Crude Unit and Butane Tank Car Loading Rack pressure relief valves will include both the removal of existing components and the addition of new components, such as pumps, valves and flanges. Leaks from these components cause fugitive VOC emissions. Removing these existing components result in removing their associated VOC emissions, while installing new components result in new fugitive VOC emissions. Fugitive VOC emission increases and decreases were evaluated to calculate the net change in operational fugitive VOC emissions from all three components of the proposed project. These emission increases and decreases were calculated by multiplying the number of each type of component added and removed by an emission factor, which represents the annual fugitive VOC emissions from each component. Details of these calculations are presented in Appendix A.

As described in Chapter 1 (Project Description), the proposed new vacuum distillation tower at the No. 51 VDU will utilize stripping steam, which will lead to an increase in sour water production, of 1,380 gallons per hour with a concentration of H_2S at 0.85 percent by weight (8,500 parts per million weight (ppmw). This increased amount of sour water generated from the unit will be processed by the existing sour water strippers to remove the H_2S from the sour water. The increase in sour water flow rate can be accommodated within the existing capacity of the sour water strippers. Therefore, the increase in sour water flow rate will not require modifications to the sour water strippers and will not change emissions from the sour water strippers.

The H_2S removed from the sour water by the sour water strippers will be processed by the refinery sulfur plant. However, as described in Chapter 1, the total amount of hydrogen sulfide produced by the proposed replacement No. 51 VDU and processed by the sulfur plant will be the same as the amount produced by the existing No. 51 VDU. Therefore, emissions from the sulfur plant will not change.

The additional sour water produced by the use of stripping steam in the proposed replacement No. 51 VDU will not cause an increase in fugitive H_2S emissions from components such as valves, flanges and pumps in sour water service. The fugitive emission rate of a substance such as H_2S contained in a process stream depends on the H_2S concentration in the process stream as well as the number and types of components that the process stream passes through, but it is independent of the process stream flow rate, because the fugitive emission factors are a function of the number of components and the stream speciation. The H_2S concentration in the sour water produced by the proposed replacement No. 51 VDU will be the same as in the sour water produced by the existing unit. Additionally, installation of the proposed replacement No. 51 VDU will not change the number or types of components in sour water service. Thus, the fugitive H_2S emission rate associated with the proposed replacement No. 51 VDU will be the same as the fugitive H_2S emission rate from the existing No. 51 VDU.

The proposed new vacuum distillation tower will result in an increase in diesel output from the No. 51 VDU and a decrease in heavy gas oil. The increased diesel production will decrease the quantity of diesel feed that is currently imported to the refinery, and the decreased heavy gas oil production rate will increase the quantity of heavy gas oil feed imported to the refinery. The

increase in the quantity of heavy gas oil that is imported will be equal to the decrease in the quantity of imported diesel feed. Thus, the proposed modifications to the No. 51 VDU will not cause a change in the total quantity of imports to the refinery. Diesel feed and heavy gas oil are currently and will continue to be imported by pipeline and marine tankers, rather than by tanker trucks or rail cars. Since the total quantity of imports will not change, the changes in diesel and gas oil production associated with the proposed new vacuum distillation tower will not lead to changes in indirect emissions from tanker trucks, rail cars or marine vessels.

The proposed replacement of Tank 710, and the proposed modifications to the No. 51 VDU, the No. 1 Crude Unit pressure relief valves, and the Butane Tank Car Loading Rack pressure relief valves will not result in changes in the operation of refinery combustion units, such as process heaters and boilers, such that no changes in emissions of CO, VOC, NO_x, $SO_x$and PM10 from refinery combustion units are expected. Additionally, upon completion of the proposed project, no additional personnel will be required during operations and no additional deliveries of materials will be necessary. Therefore, there will be no increases in emissions from off-site motor vehicle usage associated with operational activities for the proposed project. Thus, the proposed project only involves changes in fugitive VOC emissions.

Once the construction is completed, the increases, decreases and net changes in criteria pollutant emissions during operations for the proposed project are summarized in **Table 2-5**. **Table 2-5** shows that the estimated net increases in operational emissions are below the SCAQMD's significance thresholds. Therefore, no significant air quality impacts would be expected during operation.

Table 2-5
Operational Emissions Summary

Source	CO (lb/day)	VOC (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM10 (lb/day)
Emission Increases					
Tank 710	0.0	1.4	0.0	0.0	0.0
No. 51 VDU	0.0	2.2	0.0	0.0	0.0
No. 1 Crude Unit	0.0	3.0	0.0	0.0	0.0
Butane Loading Rack	0.0	0.5	0.0	0.0	0.0
Total Emission Increases	**0.0**	**7.0**	**0.0**	**0.0**	**0.0**
Emission Decreases					
Tank 710	0.0	-0.9	0.0	0.0	0.0
No. 51 VDU	0.0	-2.9	0.0	0.0	0.0
No. 1 Crude Unit	0.0	-0.3	0.0	0.0	0.0
Butane Loading Rack	0.0	-0.1	0.0	0.0	0.0
Total Emission Decreases	**0.0**	**-4.2**	**0.0**	**0.0**	**0.0**
Net Emission Changes					
Tank 710	0.0	0.5	0.0	0.0	0.0
No. 51 VDU	0.0	0.0	0.0	0.0	0.0
No. 1 Crude Unit	0.0	1.9	0.0	0.0	0.0
Butane Loading Rack	0.0	0.4	0.0	0.0	0.0
Total Emissions	**0.0**	**2.8**	**0.0**	**0.0**	**0.0**
Significance Threshold[a]	550	55	55	150	150
Significant?	**NO**	**NO**	**NO**	**NO**	**NO**

[a] There is no increase in emissions of RECLAIM pollutants (i.e., NO_x or SO_x). However, if there were an increase in emissions of RECLAIM pollutants during operation of the proposed project, the maximum allowable increase in emissions from RECLAIM sources for NO_x and SO_x would be 6,148 lb/day and 7,943 lb/day, respectively, as shown in Table 2-2.

Note: Sums of individual values may not equal totals due to rounding.

III.c) Cumulative Criteria Pollutant Emissions

The following discussion addresses potential cumulative criteria pollutant emissions during both construction and operation of the proposed project.

Cumulative Construction Emissions

Construction activities are currently occurring at the BP Carson Refinery to convert the refinery's MTBE Unit to an Iso-octene Unit which was evaluated in the April 2005 Addendum to the May 2001 Final EIR for the BP Carson Refinery CARB Phase 3/MTBE Phase-out Project and certified on April 6, 2005. Construction of the MTBE/Iso-octene conversion began in April 2005 and is expected to be completed by October 2005. **Table 2-6** shows the construction schedule for the

four components of the currently proposed project and how it overlaps the construction timeline for the MTBE/Iso-octene conversion. **Table 2-6** shows that construction of the proposed modifications to Tank 710 will overlap with construction for the MTBE/Iso-octene conversion from August 2005 through October 2005, and construction of the proposed modifications to the No. 51 VDU will overlap with construction for the MTBE/Iso-octene conversion from July 2005 through October 2005. Construction of the proposed modifications to the No. 1 Crude Unit pressure relief valves and to the Butane Tank Car Loading Rack pressure relief valves is scheduled to begin after construction for the MTBE/Iso-octene conversion is completed.

Table 2-6
Cumulative Projects Construction Schedule by Month/Year

Project Component	2005									2006									
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N
Tank 710																				
No. 51 VDU																				
No. 1 Crude Unit PRVs																				
Butane Loading Rack PRVs																				
MTBE/Iso-octene																				

Daily emissions during construction of the MTBE/Iso-octene conversion were calculated per construction month in Appendix C.1 of the April 2005 Addendum to the May 2001 Final EIR. Those emissions were added to daily construction emissions by month for the proposed project to calculate cumulative daily construction emissions of CO, VOC, NO_x, SO_x and PM10 during each month from July 2005 through October 2005, as shown in **Tables 2-7** through **2-11**, respectively. Tables 2-7, 2-8, 2-10 and 2-11 show that peak daily cumulative construction emissions of CO, VOC, SO_x and PM10 are anticipated to occur during September 2005. **Table 2-9** shows that peak daily cumulative construction emissions of NO_x are anticipated to occur during August 2005.

The peak daily cumulative construction emissions are summarized in **Table 2-12** along with the CEQA significance thresholds. It is important to note that the emissions from construction of the proposed project shown in **Table 2-12** only include emissions for the portion of the proposed project that overlaps with construction of the MTBE Unit conversion. As shown in **Table 2-12,** peak daily cumulative construction emissions are less than the significance thresholds. However, cumulative peak daily NO_x emissions are 99.3 lb/day, which is less than one pound below the 100 lb/day significance threshold. Because of potential uncertainties in the estimation of peak daily construction emissions, NO_x emissions during construction could potentially cause significant adverse cumulative air quality impacts.

Table 2-7
Daily Cumulative Construction CO Emissions per Month (lb/day)

Project	Month/Year			
	07/05	**08/05**	**09/05**	**10/05**
Proposed Project (Tank 710 & No. 51 VDU only) [a]	41.8	48.6	52.8	54.7
MTBE/Iso-Octene Conversion[b]	41.9	56.2	73.4	52.5
TOTAL	**83.7**	**104.8**	**126.2**	**107.2**

[a] Because the schedule as shown in Table 2-6 only has construction activities for Tank 710 and the No. 51 VDU overlapping with the on-going MTBE/Iso-octene conversion, these emissions are from construction associated with only the Tank 710 and No. 51 VDU portions of the proposed project during the month plus the construction emissions from the MTBE/Iso-octene conversion. These emissions are not the same as the peak daily construction emissions for the entire proposed project (e.g,. Tank 710, No. 51 VDU, No. 1 Crude Unit PRVs, and Butane Loading Rack PRVs.
[b] From Appendix C.1, Table 3 to April 2005 Addendum to May 2001 Final EIR for BP CARB Phase 3/MTBE Phase-out Project. Construction for MTBE Unit Conversion began April 2005 and is anticipated to end October 2005.
Note: Sums of individual values may not equal totals because of rounding.

Table 2-8
Daily Cumulative Construction VOC Emissions per Month (lb/day)

Project	Month/Year			
	07/05	**08/05**	**09/05**	**10/05**
Proposed Project (Tank 710 & No. 51 VDU only) [a]	8.1	8.7	8.7	9.1
MTBE/Iso-Octene Conversion[b]	6.4	9.8	11.7	10.4
TOTAL	**14.5**	**18.5**	**20.4**	**19.5**

[a] Because the schedule as shown in Table 2-6 only has construction activities for Tank 710 and the No. 51 VDU overlapping with the on-going MTBE/Iso-octene conversion, these emissions are from construction associated with only the Tank 710 and No. 51 VDU portions of the proposed project during the month plus the construction emissions from the MTBE/Iso-octene conversion. These emissions are not the same as the peak daily construction emissions for the entire proposed project (e.g,. Tank 710, No. 51 VDU, No. 1 Crude Unit PRVs, and Butane Loading Rack PRVs.
[b] From Appendix C.1, Table 3 to April 2005 Addendum to May 2001 Final EIR for BP CARB Phase 3/MTBE Phase-out Project. Construction for MTBE Unit Conversion began April 2005 and is anticipated to end October 2005.
Note: Sums of individual values may not equal totals because of rounding.

Table 2-9
Daily Cumulative Construction NO_x Emissions per Month (lb/day)

Project	Month/Year			
	07/05	08/05	09/05	10/05
Proposed Project (Tank 710 & No. 51 VDU only) [a]	66.5	56.7	65.6	66.6
MTBE/Iso-Octene Conversion[b]	25.8	42.6	32.7	32.5
TOTAL	**92.3**	**99.3**	**98.3**	**99.1**

[a] Because the schedule as shown in Table 2-6 only has construction activities for Tank 710 and the No. 51 VDU overlapping with the on-going MTBE/Iso-octene conversion, these emissions are from construction associated with only the Tank 710 and No. 51 VDU portions of the proposed project during the month plus the construction emissions from the MTBE/Iso-octene conversion. These emissions are not the same as the peak daily construction emissions for the entire proposed project (e.g,. Tank 710, No. 51 VDU, No. 1 Crude Unit PRVs, and Butane Loading Rack PRVs.
[b] From Appendix C.1, Table 3 to April 2005 Addendum to May 2001 Final EIR for BP CARB Phase 3/MTBE Phase-out Project. Construction for MTBE Unit Conversion began April 2005 and is anticipated to end October 2005.
Note: Sums of individual values may not equal totals because of rounding.

Table 2-10
Daily Cumulative Construction SO_x Emissions per Month (lb/day)

Project	Month/Year			
	07/05	08/05	09/05	10/05
Proposed Project (Tank 710 & No. 51 VDU only) [a]	9.2	7.3	10.4	8.9
MTBE/Iso-Octene Conversion[a]	3.2	5.5	3.4	3.9
TOTAL	**12.4**	**12.8**	**13.8**	**12.8**

[a] Because the schedule as shown in Table 2-6 only has construction activities for Tank 710 and the No. 51 VDU overlapping with the on-going MTBE/Iso-octene conversion, these emissions are from construction associated with only the Tank 710 and No. 51 VDU portions of the proposed project during the month plus the construction emissions from the MTBE/Iso-octene conversion. These emissions are not the same as the peak daily construction emissions for the entire proposed project (e.g,. Tank 710, No. 51 VDU, No. 1 Crude Unit PRVs, and Butane Loading Rack PRVs.
[b] From Appendix C.1, Table 3 to April 2005 Addendum to May 2001 Final EIR for BP CARB Phase 3/MTBE Phase-out Project. Construction for MTBE Unit Conversion began April 2005 and is anticipated to end October 2005.
Note: Sums of individual values may not equal totals because of rounding.

Table 2-11
Daily Cumulative Construction PM10 Emissions per Month (lb/day)

Project	Month/Year			
	07/05	**08/05**	**09/05**	**10/05**
Proposed Project (Tank 710 & No. 51 VDU only) [a]	8.5	9.7	10.2	11.7
MTBE/Iso-Octene Conversion[b]	5.5	7.1	8.5	6.8
TOTAL	**14.0**	**16.8**	**18.7**	**18.5**

[a] Because the schedule as shown in Table 2-6 only has construction activities for Tank 710 and the No. 51 VDU overlapping with the on-going MTBE/Iso-octene conversion, these emissions are from construction associated with only the Tank 710 and No. 51 VDU portions of the proposed project during the month plus the construction emissions from the MTBE/Iso-octene conversion. These emissions are not the same as the peak daily construction emissions for the entire proposed project (e.g,. Tank 710, No. 51 VDU, No. 1 Crude Unit PRVs, and Butane Loading Rack PRVs.
[b] From Appendix C.1, Table 3 to April 2005 Addendum to May 2001 Final EIR for BP CARB Phase 3/MTBE Phase-out Project. Construction for MTBE Unit Conversion began April 2005 and is anticipated to end October 2005.
Note: Sums of individual values may not equal totals because of rounding.

Table 2-12
Peak Daily Cumulative Construction Emissions Summary

Project	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	PM10 (lb/day)
Proposed Project (Tank 710 & No. 51 VDU only) [a]	52.8	8.7	56.7	10.4	10.2
MTBE/Iso-octene Conversion	73.4	11.7	42.6	3.4	8.5
TOTAL	**126.2**	**20.4**	**99.3**	**13.8**	**18.7**
CEQA Significance Level	550	75	100	150	150
Significant? (Yes/No)	No	No	No	No	No

[a] Because the schedule as shown in Table 2-6 only has construction activities for Tank 710 and the NO. 51 VDU overlapping with the on-going MTBE/Iso-octene conversion, these emissions are from construction associated with only the Tank 710 and No. 51 VDU portions of the proposed project during the month with the highest combined construction emissions plus the construction emissions from the MTBE/Iso-octene conversion. These emissions are not the same as the peak daily construction emissions for the entire proposed project (e.g,. Tank 710, No. 51 VDU, No. 1 Crude Unit PRVs, and Butane Loading Rack PRVs.
Note: Sums of individual values may not equal totals because of rounding.

Cumulative Operational Criteria Pollutant Emissions

The April 2005 Addendum concluded that conversion of the MTBE Unit to an Iso-octene Unit will not cause a change in operational CO, NO_x, SO_x and PM10 emissions and will lead to a net decrease in operational VOC emissions of 4.0 pounds per day. Since the MTBE/Iso-octene conversion will not increase operational emissions, operational criteria pollutant emissions from the currently proposed project will not cause cumulative significant adverse air quality impacts when added to the operational criteria pollutant emissions from the converted MTBE Unit.

Health Risks

III.d) As discussed in III.a) and b), the proposed project will lead to changes in fugitive emissions from components such as valves, flanges and pumps. Some of the chemical compounds in the process streams that pass through these components are classified as TACs. As a result, the proposed projects will lead to changes in fugitive TAC emissions.

The fugitive VOC emission increases and decreases are summarized in **Table 2-5** and are from process streams that contain organic compounds. The net increases in fugitive TAC emissions from these process streams were calculated by multiplying the net increases in fugitive VOC emissions by the weight fractions for each of the TACs in the process streams. The weight fractions of each TAC in the process streams can be different for different streams. In particular, weight fractions of TACs in gaseous process streams associated with the proposed modifications to the No. 1 Crude Unit pressure relief valves are not the same as weight fractions of TACs in liquid process streams associated with these modifications. Thus, fugitive emissions from gaseous and light-liquid process streams were calculated separately and then multiplied by the corresponding TAC weight fractions to calculate the net increase in TAC emissions from the proposed modifications to the No.1 Crude Unit pressure relief valves. Additionally, the process streams involved with the proposed modifications to the Butane Tank Car Loading Rack pressure relief valves consist entirely of normal butane and iso-butane, which are not TACs. Therefore, the proposed modifications to the Butane Tank Car Loading Rack pressure relief valves will not cause a change in TAC emissions.

Sour water streams consist of water, H_2S and NH_3, which are not organic compounds and, therefore, do not have the potential to generate fugitive VOC emissions. However, leaks from components in sour water service cause fugitive emissions of water, H_2S and NH_3. The net increase in fugitive emissions of H_2S and NH_3, which are TACs, from components in sour water service associated with the proposed replacement of Tank 710 were determined by first calculating the total sour water leak rate from the components. Because emission factors for leaks from components in sour water service have not been developed, fugitive VOC emission factors for components in light liquid service were used to calculate the total sour water leak rates. The total sour water leak rates were then multiplied by the H_2S and NH_3 weight fractions in the sour water streams to calculate fugitive H_2S and NH_3 emissions. It is important to note that a net change in the number of components in sour water service, and a resulting change in the amount of fugitive H_2S and NH_3 emissions from components in sour water service, will only occur for the proposed sour water tank replacement. Additionally, the proposed new sour water tank will be a pressurized sphere that will not generate fugitive emissions from the tank itself.

Estimated net increases in TAC emissions resulting from implementing the proposed modifications to Tank 710, the No. 51 VDU and the No. 1 Crude Unit pressure relief valves are listed in **Tables 2-13**, **2-14** and **2-15**, respectively. As shown in the footnote to **Table 2-13**, the column labeled "Net Increase in Total Fugitive Emissions" lists the net increase in fugitive VOC emissions from organic compound process streams and the net increase in fugitive water, H_2S and NH_3 emissions from sour water process streams. The net increases in TAC emissions for the proposed project are summarized in **Table 2-16**.

Table 2-13
Net Increase in Toxic Air Contaminant Emissions from Tank 710 Replacement

Stream Type	Net Increase in Total Fugitive Emissions (lb/yr)[a]	TAC	TAC Mass Fraction	Net Increase in TAC Annual Emissions (lb/yr)
Organic	186.0	Ammonia	0.006	1.1
		Hydrogen Sulfide	0.0085	1.6
Sour Water	394.0	Ammonia	0.006	2.4
		Hydrogen Sulfide	0.0085	3.3

[a] Total fugitive emissions from organic streams are VOC; total fugitive emissions from sour water streams are water, H_2S and NH_3.

Table 2-14
Net Increase in Toxic Air Contaminant Emissions from No. 51 VDU Replacement

Stream Type	Net Increase in Fugitive VOC Emissions (lb/yr)[a]	TAC	TAC Mass Fraction	Net Increase in TAC Annual Emissions (lb/yr)
Organic	10.3	Hexane	0.0944	1.0

[a] Total fugitive emissions from organic streams are VOC.

Table 2-15
Net Increase in Toxic Air Contaminant Emissions from No. 1 Crude Unit Relief Valves Replacement

Stream Type	Net Increase in Fugitive VOC Emissions (lb/yr)[a]	TAC	TAC Mass Fraction	Net Increase in TAC Annual Emissions (lb/yr)
Gaseous Organic	484.5	Hydrogen Sulfide	0.000025	0.01
		Benzene	0.012	5.8
		Toluene	0.0276	13.4
Liquid Organic	193.0	Hydrogen Sulfide	0.0	0.0
		Benzene	0.0013	0.25
		Toluene	0.0122	2.35

Table 2-16
Summary of Annual Net Increases in TAC Emissions from Proposed Project

TAC	Annual Emissions (lb/yr)
Ammonia	3.48
Hydrogen Sulfide	4.94
Hexane	0.97
Benzene	6.06
Toluene	15.73

Note: Totals may not equal sums of individual values in Tables 2-7, 2-8 and 2-9 because of rounding.

A Tier 1 screening health risk assessment (HRA) was prepared for the proposed TAC emission increases in **Table 2-16** using the SCAQMD Rule 1401 Risk Assessment Procedures (Version 6.0). The total net emission increase of each TAC from all three components of the proposed project combined were used for this screening HRA. **Table 2-17** shows the emission estimates and screening values for TACs that are carcinogens or have chronic non-cancer health effects. In all cases, the estimated emissions were below the 100 meter screening level. The 100 meter screening level is appropriate to use since the nearest commercial and residential receptors are located approximately 1,100 feet and 3,000 feet beyond the facility property line, respectively. When adding the pollutant screening indexes (PSI) (emissions divided by screening level) of all TACs, the total was below the SCAQMD threshold of one. A total of less than one corresponds to a maximum cancer risk of less than 10 in one million and a chronic hazard index of less than 1.0. Therefore, since the total is less than one, no significant carcinogenic or chronic non-cancer health impacts would be expected.

Table 2-17
Tier 1 Screening Health Risk Assessment for Net Increases in Emissions of Carcinogens and Non-Cancer Chronic TACs from Proposed Project

TAC	Annual Emissions (lb/yr)	100 meter Screening Level (lb/yr)	PSI[a]
Ammonia	3.48	51,700	0.0001
Hydrogen Sulfide	4.94	2,850	0.0017
Hexane	0.97	1,810,000	<0.0001
Benzene	6.06	8.91	0.68
Toluene	15.73	77,500	0.0002
		Total	**0.68**
		Total Screening Threshold	**1.0**
		Total Above Threshold?	**No**

[a] Pollutant Screening Index (PSI) is estimated emissions divided by screening level emissions

Emission estimates and screening values for TACs that have acute health effects are shown in **Table 2-18**. In all cases, the estimated emissions were below the 100 meter screening level. Additionally, the total of the PSIs is below the SCAQMD threshold of one. A total of less than one corresponds to a maximum acute hazard index of less than 1.0. Because the total is less than one, no significant acute health impacts would be expected.

Table 2-18
Tier 1 Screening Health Risk Assessment for Net Increases in Emissions of Acute TACs from Proposed Project

TAC	Hourly Emissions (lb/hr)	100 meter Screening Level (lb/hr)	PSI[a]
Ammonia	0.00040	8.570	<0.0001
Hydrogen Sulfide	0.00056	0.112	0.0050
Benzene	0.00069	3.960	0.0002
Toluene	0.00180	99.06	<0.0001
		Total	**0.0053**
		Total Screening Threshold	**1.0**
		Total Above Threshold?	**No**

[a] Pollutant Screening Index (PSI) is estimated emissions divided by screening level emissions

Cumulative Health Risks

The analysis for the April 2005 Addendum concluded that conversion of the MTBE Unit to an Iso-octene Unit would not cause a net increase in TAC emissions. Thus, TAC emissions from the currently proposed project will not cause cumulative significant adverse health risks when combined with TAC emissions from the conversion of the MTBE Unit to an Iso-octene Unit.

III.e) The primary reason for replacing the existing Tank 710 with the proposed pressurized sour water surge sphere is to address the prior violations of SCAQMD Rule 402 - Prohibition of Nuisances and prior odor complaints caused by H_2S and NH_3 releases, thus reducing odors. The design of the pressurized sphere will prevent fugitive emissions directly from the tank. Normal venting from the vapor space above the sour water contained in the proposed new spherical tank will be routed to the refinery's vapor recovery system, which will prevent direct venting of H_2S and NH_3 to the atmosphere. Additionally, higher pressure releases from the proposed new spherical tank will be directed to the coker low line, which will prevent H_2S and NH_3 releases to the atmosphere. As a result, atmospheric releases of H_2S and NH_3 by replacing the existing Tank 710 with a new pressurized spherical tank would not be expected to cause objectionable odors.

Fugitive H_2S and NH_3 emissions from components associated with the existing sour water Tank 710 and its replacement and fugitive H_2S emissions from components associated with the No. 1 Crude Unit relief valves modifications have the potential to produce odors. The odor threshold for NH_3 is approximately 17 parts per million (ppm) (OEHHA, 1999a), while the acute REL for NH_3 is 3,200 $\mu g/m^3$, which is equivalent to 4.5 ppm, or about one-quarter of the odor threshold. Since the Tier 1 acute HRA PSI for NH_3 in **Table 2-18** is less than 0.0001, the ambient NH_3 concentration caused by fugitive emissions will be less than the REL, which is, in turn, less than the odor threshold. Therefore, fugitive NH_3 emissions would not cause objectionable odors.

The odor threshold for H_2S is approximately 0.008 ppm (OEHHA, 1999b), while the acute REL for H_2S is 42 $\mu g/m^3$, which is equivalent to 0.030 ppm. The concentration resulting from the H_2S emissions is estimated from the acute Tier 1 HRA PSI for H_2S by the following equation:

$$\begin{aligned} H_2S \text{ Concentration [ppm]} &= H_2S \text{ Acute PSI} \times \text{Acute } H_2S \text{ REL [ppm]} \\ &= 0.005 \times 0.030 \text{ ppm} \\ &= 0.0002 \text{ ppm} \end{aligned}$$

Since this concentration is substantially less than the odor threshold of 0.008 ppm, fugitive H_2S emissions would not be expected to cause objectionable odors.

III.f) The project proponent must comply with applicable SCAQMD requirements and control measures for new or modified sources. For example, new emission sources associated with the proposed project are required to comply with the SCAQMD's Regulation XIII - New Source Review requirements that include the use of BACT. The project proponent must also comply with prohibitory rules, such as Rule 403, for the control of fugitive dust. Additionally, as presented in the discussion under III.b) and III.c), emission increases during construction and operation of the proposed projects will be less than the SCAQMD CEQA significance thresholds. Therefore, the

proposed project would not diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s).

Mitigation Measures

As discussed in III.c), NO_x emissions during construction could potentially cause adverse cumulative air quality impacts. The following mitigation measure will be implemented to reduce NO_x emissions during construction to ensure that the significance threshold is not exceeded:

Mitigation Measure AQ-1: Diesel-powered construction equipment will be fueled with emulsified diesel fuel throughout construction of the proposed modifications to the four components of the project.

The California Air Resources Board has established an interim procedure for verification of emission reductions for alternative diesel fuels. This procedure has been used to verify emission reductions from the use of four alternative diesel fuels: PuriNOx diesel fuel developed by Lubrizol Corporation, Aquazole fuel developed by TotalFinaElf, Clean Fuels Technology's emulsified diesel fuel, and O_2 Diesel Fuel developed by O_2 Diesel, Inc. Specifically, Lubrizol's water-emulsified PuriNOx diesel fuel has been verified to reduce NO_x emissions by 14 percent and PM10 emissions by 62.9 percent (ARB, 2001).

BP has contacted a local distributor of PuriNOx, who currently supplies PuriNOx to other customers in the South Coast Air Basin, and verified that the distributor has the capacity to supply the quantities of diesel fuel required during construction of the proposed project. The supplier will locate a temporary fuel storage tank for PuriNOx diesel fuel at the refinery to be used to refuel mobile construction equipment for the proposed project. The distributor will refill the temporary fuel storage tank periodically as needed during the construction period and will also refuel non-mobile construction equipment, such as large cranes, on-site. Truck trips to refill the temporary fuel storage tank and to refuel non-mobile equipment will be scheduled for weekends, when other construction activities for the proposed project are not occurring. Therefore, fuel delivery truck trips will not increase peak daily emissions.

Prior to the start of construction for the proposed project, BP will verify that the construction equipment operates properly when fueled with PuriNOx diesel fuel. Minor modifications to the equipment will be made, if necessary.

Table 2-19 summarizes mitigated peak daily cumulative construction emissions. The table shows that the use of emulsified diesel fuel in construction equipment will reduce peak daily cumulative NO_x and PM10 emission by 6.9 lb/day and 1.8 lb/day, respectively. Peak daily cumulative NO_x emissions will be reduced to 92.4 lb/day, which will ensure that emissions from construction of the proposed project will not cause significant adverse cumulative air quality impacts when added to the criteria pollutant emissions from construction of the MTBE/Iso-octene conversion.

Table 2-19
Mitigated Peak Daily Cumulative Construction Emissions

Source	CO (lb/day)	VOC (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM10 (lb/day)
Proposed Project					
Construction Equipment	20.6	5.1	49.2	10.3	2.9
Mitigation Reduction (%)[a]	0.0%	0.0%	14.0%	0.0%	62.9%
Mitigation Reduction (lb/day)	0.0	0.0	-6.9	0.0	-1.8
Remaining Emissions	20.6	5.1	42.3	10.3	1.1
On-Site Motor Vehicles	2.5	0.3	1.7	0.0	3.3
Fugitive PM10	N/A	N/A	N/A	N/A	2.1
Architectural Coating	N/A	0.0	N/A	N/A	N/A
Asphaltic Paving	N/A	0.0	N/A	N/A	N/A
Off-Site Motor Vehicles	29.7	3.2	5.9	0.1	1.9
Total Proposed Project	**52.8**	**8.7**	**49.9**	**10.4**	**8.4**
MTBE/Iso-octene Conversion	73.4	11.7	42.6	3.4	8.5
Cumulative Total	**126.2**	**20.4**	**92.4**	**13.8**	**16.8**
CEQA Significance Threshold	*550*	*75*	*100*	*150*	*150*
Significant? (Yes/No)	No	No	No	No	No

[a] Reduction is based on January 31, 2001, verification letter from Dean C. Simeroth, California Air Resources Board, to Thomas J. Sheahan, Lubrizol Corp.
N/A = pollutant not emitted by this source
Note: Totals may not match sums of individual values because of rounding.

Implementation of mitigation measure AQ-1 will also reduce the peak daily NO_x and PM10 emissions from construction of the proposed project shown in **Table 2-3**. Mitigated peak daily construction emissions are summarized in Table **2-20**.

Table 2-20
Mitigated Peak Daily Construction Emissions Summary

Source	CO (lb/day)	VOC (lb/day)	NO_X (lb/day)	SO_X (lb/day)	PM10 (lb/day)
Construction Equipment	31.4	9.9	80.8	12.5	6.2
Mitigation Reduction (%)[a]	0%	0%	14%	0%	63%
Mitigation Reduction (lb/day)	0.0	0.0	-11.3	0.0	-3.9
Remaining Emissions	31.4	9.9	69.5	12.5	2.3
On-Site Motor Vehicles	3.6	0.4	1.6	0.0	4.7
On-Site Fugitive PM10	N/A	N/A	N/A	N/A	0.0
Architectural Coating	N/A	28.9	N/A	N/A	N/A
Asphaltic Paving	N/A	0.0	N/A	N/A	N/A
Total On-Site	**35.0**	**39.2**	**71.1**	**12.5**	**7.0**
Off-Site Motor Vehicles	**91.1**	**9.8**	**9.4**	**0.1**	**5.7**
TOTAL	**126.1**	**49.0**	**80.4**	**12.6**	**12.7**
CEQA Significance Level	*550*	*75*	*100*	*150*	*150*
Significant? (Yes/No)	No	No	No	No	No

[a] Reduction is based on January 31, 2001, verification letter from Dean C. Simeroth, California Air Resources Board, to Thomas J. Sheahan, Lubrizol Corp.
N/A = pollutant not emitted by this source
Note: Totals may not match sums of individual values because of rounding.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
IV.	**BIOLOGICAL RESOURCES.** Would the project:			
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
c)	Have a substantial adverse effect on federally protected wetlands as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☑
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☑
e)	Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☑
f)	Conflict with the provisions of an adopted Habitat Conservation plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☑

Significance Criteria

Impacts on biological resources would be considered significant if any of the following criteria apply:

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

Environmental Setting and Impacts

IV.a)-f) The proposed project is located within the existing boundaries of BP's Carson Refinery, which is zoned for heavy industrial use and has already been greatly disturbed. One animal species listed as a federal and state species of special concern, the burrowing owl (*Athene cunicularia)*, was reported in 1985 as occurring in the southwest area of the refinery in an inactive tank farm located across Sepulveda Boulevard (SCAQMD, 1993). However, proposed project construction and operational activities will not occur in this area of the refinery property.

A review of the California Natural Diversity Data Base did not reveal records of special status species at or within one mile of the Carson Refinery (CNDDB 2005). Based on the disturbed nature of the refinery site, the industrial nature of the proposed and existing activities at the site,

and the absence of records of special status species, no specific wildlife surveys were considered necessary and none were performed. The proposed project is not expected to have a significant adverse effect, either directly or through habitat modifications, on any species identified as a special status species.

No riparian, wetlands, or other sensitive natural communities, occur at the proposed project site, nor does the refinery property serve as a migratory corridor. The proposed project does not conflict with adopted or approved habitat conservation plans, because there are no such plans in effect in the vicinity of the refinery.

Mitigation Measures

Based upon these considerations, significant adverse biological resources impacts are not anticipated. Since no significant biological resource impacts were identified, no mitigation measures are required or necessary.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
V.	**CULTURAL RESOURCES.** Would the project:			
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☑
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☑	☐
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☑
d)	Disturb any human remains, including those interred outside formal cemeteries?	☐	☑	☐

Significance Criteria

Impacts to cultural resources would be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- The project would disturb unique paleontological resources.
- The project would disturb human remains.

Environmental Setting and Impacts

V.a) CEQA Guidelines state that "generally, a resource shall be considered 'historically significant' if the resource meets the criteria for listing in the California Register of Historical Resources including the following:

A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B) Is associated with the lives of persons important in our past;

C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values;

D) Has yielded or may be likely to yield information important in prehistory or history" (CEQA Guidelines Section 15064.5).

Generally, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places[2] unless they can be shown to be exceptionally important) (SCVTA/FTA 2004). The buildings, structures, and equipment associated with the proposed project are not listed on registers of historic resources, and do not meet the eligibility criteria presented above (e.g., associated with historically important events or people, embodying distinctive characteristics of a type, period, or method of construction), and would not be likely to yield historically important information. The only component of the proposed project that involves a structure that would meet the age criteria of 50 years is the existing vacuum distillation tower at the No. 51 VDU, which was constructed in 1953 (slightly over 50 years ago), and will be replaced by a new vacuum distillation tower. However, the existing vacuum distillation tower will be disconnected and abandoned in place and there are no plans to demolish, remove, or modify it. Despite its age, the existing tower does not meet the aforementioned historical significance criteria. Therefore, no significant impacts to historic cultural resources are expected as a result of implementing the proposed project.

V.b), c), & d) BP's Carson Refinery is located in an area of high archaeological sensitivity. As discussed in the CARB Phase 3/MTBE Phase-out project Final EIR (SCAQMD, May 2001), the Tongva/Gabrielino village site known as Suangna is located at and near a portion of the refinery, and CA-LAN-262, a large cemetery, was exposed at the property in 1998. Earth disturbance associated with the construction of the proposed project will not impact the known limits of either of these sites. Proposed project activities will occur in areas of the refinery where the ground surface has already been disturbed, and this past disturbance reduces the likelihood that previously unknown resources will be encountered. There is a low likelihood that cultural resources will be encountered during construction of the proposed project. The refinery site does not contain known paleontological resources, and thus the proposed project also is not expected to impact any sites of paleontological value.

[2] The eligibility criteria of the California Register criteria are modeled on those of the eligibility criteria of the National Register of Historic Places

Mitigation Measures

While the likelihood of encountering cultural resources is low, there is still a potential that additional buried archaeological resources may exist, and such resources conceivably could be adversely affected by ground disturbance associated with construction of the proposed project. Any such impact would be considered significant, but would be reduced to less-than-significant with implementation of the following mitigation measures in the event that unexpected sub-surface resources were encountered:

Mitigation Measure CU-1: Conduct a cultural resources orientation for construction workers involved in excavation activities. This orientation will show the workers how to identify the kinds of cultural resources that might be encountered, and what steps to take if this occurred;

Mitigation Measure CU-2: Monitoring of subsurface earth disturbance by a professional archaeologist and a Gabrielino/Tongva representative if cultural resources are exposed during construction;

Mitigation Measure CU-3: Provide the archaeological monitor with the authority to temporarily halt or redirect earth disturbance work in the vicinity of cultural resources exposed during construction, so the find can be evaluated and mitigated as appropriate; and,

Mitigation Measure CU-4: As required by State law, prevent further disturbance if human remains are unearthed, until the County Coroner has made the necessary findings with respect to origin and disposition, and the Native American Heritage Commission has been notified if the remains are determined to be of Native American descent.

		Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
VI.	**ENERGY.** Would the project:			
a)	Conflict with adopted energy conservation plans?	☐	☐	☑
b)	Result in the need for new or substantially altered power or natural gas utility systems?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
c)	Create any significant effects on local or regional energy supplies and on requirements for additional energy?	☐	☑	☐
d)	Create any significant effects on peak and base period demands for electricity and other forms of energy?	☐	☑	☐
e)	Comply with existing energy standards?	☐	☐	☑

Significance Criteria

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

- The project conflicts with adopted energy conservation plans or standards.
- The project results in substantial depletion of existing energy resource supplies.
- The project would cause an increase in demand for utilities that impacts the current capacities of the electric and natural gas utilities.
- The project uses non-renewable resources in a wasteful and/or inefficient manner.

Environmental Setting and Impacts

VI.a) & e) The proposed project is not expected to conflict with energy conservation plans or energy standards. It is in the economic interest of BP to conserve energy and comply with existing energy standards in order to minimize operating costs. New equipment installed as part of the proposed modifications will be as efficient as replaced equipment. Further, energy used to operate the new sour water spherical tank, the new vacuum distillation tower, or the modified crude unit and Butane Tank Car Loading Rack pressure relief valves is not considered a wasteful use of energy that will interfere or conflict with existing energy conservation plans.

VI.b) It is not expected that natural gas-fired or electrically powered construction equipment or vehicles will be used and, thus, there will be no need for new or substantially altered power or natural gas utility systems during construction of the proposed project. Natural gas will be used as purge gas in the pressure header for the proposed modifications to the No. 1 Crude Unit pressure relief valves, but additional natural gas will not be used for combustion during operation of the proposed project. The proposed project will not result in the need for new or substantially altered power or natural gas utility systems, because the power and natural gas needed to operate the new and modified equipment are available from the existing refinery utility system.

VI.c) & d) Energy will be consumed during both construction and operation of the proposed project.

Construction Impacts

Construction of the proposed project is not expected to involve the use of construction equipment or vehicles that are fueled by natural gas or are electrically powered; thus, construction of the proposed projected will not affect natural gas or electrical power demand. Diesel and gasoline fuel will be consumed in construction equipment as well as by construction workers' vehicles used for commuting to and from the construction site and trucks used for deliveries of equipment, materials, and supplies.

Table 2-21 shows the projected diesel and gasoline fuel use during construction of the proposed project and compares the projected usage to the applicable available fuel supply. Details pertaining to the calculation of fuel use during construction are provided in Appendix A. As shown in the table, the projected fuel use for both diesel and gasoline during construction is a small percentage of the total fuel available. Since the increased demand for fuel is so small and construction activities are not considered wasteful activities, increased demand for fuel during construction is not considered to be a significant adverse energy impact. In short, the equipment and vehicles needed for construction-related activities associated with implementation of the proposed project are necessary and will not use energy in a wasteful manner. There will not be a substantial depletion of energy resources nor will significant amounts of fuel be needed when compared to existing supplies. These results confirm that the energy impacts during construction of the proposed project will not be significant.

Table 2-21
Total Projected Fuel Usage for Construction Activities

Construction Activity	Total Fuel Usage Per Activity (gallons)	
	Diesel	**Gasoline**
Onsite Equipment	65,000	3,000
Offsite Equipment	6,000	41,000
Project Total	71,000	44,000
Threshold Fuel Supply[a]	1,086,000,000	6,469,000,000
% of Fuel Supply	0.006	0.0007
Significant (Yes/No)[b]	No	No

[a] Year 2000 California Energy Commission (CEC) Projections. Construction activities in future years would yield similar results.

[b] SCAQMD's Energy Threshold for both Diesel and Gasoline is 1% of Supply.

Operational Impacts

Operation of the proposed project is not expected to require additional staffing at the refinery, and thus there will be no additional fuel use associated with worker commute trips. Further, there will not be additional truck deliveries or off-site shipments during operation of the proposed project; thus, there will be no additional fuel use associated with project truck travel. Thus, operation

activities associated with the proposed project are expected to have no effect on the availability of gasoline or diesel fuel.

Energy use during operation of the proposed project is shown in **Table 2-22**. The proposed project is not expected to significantly change natural gas consumption levels at the refinery over current levels. The proposed project will result in an increase in electrical power demand of approximately 0.22 megawatts (MW) due to an increase in pumping and blower requirements for the proposed replacement of the vacuum distillation tower in the No. 51 VDU. As shown in **Table 2-22**, the power consumption during operation of the proposed project will be relatively small and, therefore, not significant.

Table 2-22
Total Projected Energy Usage for Operational Activities

Operation Activity	Total Additional Energy Usage Per Activity	
	Natural Gas	**Electricity**
New Vacuum Distillation Unit	0 TCF	0.22 MW (instantaneous)
New Sour Water Tank	0 TCF	0
Modified Pressure Relief Valves	< 0.001 TCF	0
Project Total	< 0.0001 TCF	0.22 MW (instantaneous)
Threshold Fuel Supply[a]	0.7200 TCF	8,115 MW (instantaneous)
% of Fuel Supply	0	0.00003
Significant (Yes/No)[b]	No	No

[a] Year 2000 California Energy Commission (CEC) Projections. Operational activities in future years would yield similar results.
[b] The SCAQMD considers an increase in energy demand of less than one percent of the available energy supply to be less than significant.
KEY TCF = trillion cubic feet MW = Megawatt

The proposed installation of the new sour water spherical surge tank and the proposed modifications to the Butane Tank Car Loading Rack pressure relief valves will not change the amount of electrical consumption at the refinery. Further, the proposed modifications to the No. 1 Crude Unit pressure relief valves will not increase the amount of power consumed except on occasions when excess pressure builds up in the units and causes one or more pressure relief valves to open. If this occurs, the pumps to the new 15-HP knockout drum will operate for a short time to remove liquids from the stream released by the pressure relief valves prior to sending the vapors to the refinery flare system. However, such an occurrence is not part of routine refinery operations. There has been only one pressure relief event at the No. 1 Crude Unit since the end of 2002, and during that event, the pressure relief valves were open for a total of two minutes (BP 2003). Thus, although it is impossible to predict how often a non-routine event will occur, pressure relief events are infrequent and of short duration. Therefore, operation of the pumps to the proposed new 15 HP knockout drum will cause minimal energy consumption.

To provide additional context for the expected power consumption for the proposed project, BP's Carson Refinery receives almost all of its electrical power from the Watson Cogeneration facility.

This cogeneration facility is located on the refinery property, is 51 percent owned by BP, and is included in the refinery's SCAQMD permit. The Watson Cogeneration facility has a generation capacity of over 320 MW and supplies the refinery with approximately 727,000 MW-hr per year. The refinery also purchases a small amount (257 MW-hr per year) of power from Southern California Edison. Thus, the proposed project will represent a very small increment in power consumption at the refinery (1,927 MW-hr per year[3], which is 0.3 percent of the refinery's total electrical power consumption of approximately 727,000 MW-hr per year).

In summary, the energy demand for the proposed project will not affect the capacities of the electric and natural gas utilities, and the anticipated energy impacts during operation of the proposed project are expected to be less than significant.

Mitigation Measures

Based upon these considerations, significant adverse energy resources impacts are not anticipated. Since no significant energy resource impacts were identified, no mitigation measures are required or necessary.

	Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
VII. GEOLOGY AND SOILS. Would the project:			
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☑	☐
• Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☑	☐
• Strong seismic ground shaking?	☐	☑	☐
• Seismic–related ground failure, including liquefaction?	☐	☐	☑
• Landslides?	☐	☐	☑

[3] 0.22 MW x 24 hr/day x 365 days/yr = 1,927 MW-hr/yr.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☑	☐
c)	Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☑
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☑
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☑

Significance Criteria

Impacts on the geological environment would be considered significant if any of the following criteria apply:

- The project would require topographic alterations which would result in significant changes, disruptions, displacement, excavation, and compaction or over covering of large amounts of soil.
- The proposed project would disturb unique geological resources (paleontological resources or unique outcrops).
- The project would expose people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- The project would be affected by secondary seismic effects which could damage facility structures, e.g., liquefaction.
- The project would be affected by other geological hazards which could adversely affect the facility, e.g., landslides, mudslides.

Environmental Setting and Impacts

VII.a) The refinery is located near but not within the earthquake fault zones delineated as part of the Alquist-Priolo Special Study area for the Newport-Inglewood fault zone. This zone is located approximately 4.3 miles northeast of the refinery. Therefore, the risk to the refinery due to earthquake-induced ground rupture is considered to be less than significant.

The use of standard engineering practices for building within a seismically active area such as the Long Beach area requires that project design and construction practices adhere to appropriate earthquake safety codes. BP will adhere to the current Uniform Building Code in designing and constructing the new and modified refinery equipment. With proper design and construction, no significant adverse impacts from strong seismic ground shaking are expected from the proposed project.

Liquefaction is a mechanism of ground failure whereby earthquake-induced ground motion transforms loose, water-saturated granular material to a liquid state. The northeast corner of the refinery has been identified by the California Division of Mines and Geology as an area that has the potential for permanent ground displacements due to liquefaction. However, the proposed project equipment locations are not in this area of the refinery and, thus, liquefaction impacts are not expected.

As the topography at the refinery is generally level, the potential is negligible for slope instability at the sites where construction is planned; therefore, no impacts are anticipated.

VII.b) Erosion from wind or water could occur during construction of the proposed project as soils are exposed at the locations where new or modified equipment are proposed to be sited. However, the area of soil disturbance associated with construction of the proposed project will be small (a combined total of less than 0.5 acre disturbed for all four proposed project locations). Standard construction grading practices and retention features will contain runoff. Further, the proposed project will be required to comply with SCAQMD Rule 403 which requires various measures to control fugitive dust, (e.g., application of water during ground disturbing activities), and these measures will minimize wind erosion. The combination of these factors will combine to keep impacts to an insignificant level.

VII.c) & d) The uppermost four to 10 feet of soil materials at the refinery comprise granular alluvial materials and sandy, silty artificial fills, none of which tend to show significant soil expansion as defined in Table 18-1-B of the Uniform Building Code, nor are they particularly susceptible to liquefaction. Because salt water is reinjected in place of oil and gas removed from fields in the vicinity of the refinery, subsidence is not expected to cause problems during construction or operation of the proposed project. Because of the relatively flat topography, the site and vicinity of the proposed project are not prone to landslides. In summary, the proposed project is not expected to result in significantly adverse impacts related to expansive soils, or unstable geologic or soils conditions.

VII.e) Sanitary wastewater from the refinery is discharged to the Los Angeles County Sanitation District sewer system so installation of alternative wastewater treatment systems is not included as part of the proposed project. Because wastewater associated with the proposed project will be discharged to a sewer system, soils at the refinery site are not required to be usable to support septic tanks or other alternative wastewater disposal systems.

Mitigation Measures

Based upon these considerations, significant adverse geology and soils impacts are not anticipated for the proposed project. Since no significant geology and soils impacts were identified, no mitigation measures are required or necessary.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
VIII.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:			
a)	Create a significant hazard to the public or the environment through the routine transport, use, and disposal of hazardous materials?	☐	☐	☑
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☑	☐
c)	Emit hazardous emissions, or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☑
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would create a significant hazard to the public or the environment?	☐	☑	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☑
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☑
i)	Significantly increased fire hazard in areas with flammable materials?	☐	☑	☐

Significance Criteria

The impacts associated with hazards would be considered significant if the project results in any of the following:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

Environmental Setting and Impacts

The following paragraphs describe features of the existing environment as they relate to the risk of a major accident occurring at the refinery. Factors that are taken into consideration to determine the risk associated with a potential upset event are:

- The probability of an event occurring;
- The consequence of an event (exposures);
- The types of materials potentially involved in an upset event; and
- The location of sensitive receptors, e.g. residences, schools, and businesses.

The most probable accident scenarios for the existing equipment are the failure of the existing Tank 710 sour water surge tank with the subsequent release of NH_3 or H_2S to the atmosphere, or a release of flammable gases and/or liquids caused by a breach in the existing vacuum distillation tower at the No. 51 VDU. The flammable substances that could be released by failure of the existing vacuum distillation tower are the feed and product materials, which consist of atmospheric residual light and heavy gas oil, and vacuum residual. Potential releases could occur either as gases, liquids, or a combination of both phases.

In this Hazards and Hazardous Materials section, the term "upset" is defined as an occurrence of conditions outside normal operating parameters that results in the release of hazardous materials to the environment. Thus, upset incidents are unexpected releases of hazardous materials that may create adverse effects on human health or the environment.

The existing sour water collection tank (Tank 710) contains H_2S and NH_3 at average concentrations of 7,500 ppmw H_2S and 7,900 ppmw NH_3. With a maximum volume of 55,000 barrels, these concentrations yield total quantities of approximately 145,000 pounds of H_2S and 152,000 pounds of NH_3 in Tank 710

The Carson Refinery currently adheres to the following safety design and process standards:

- The California Health and Safety Code Fire Protection specifications;
- The design standards for petroleum refinery equipment established by American Petroleum Institute, American Society of Mechanical Engineers, the American Institute of Chemical Engineers, the American National Standards Institute, and the American Society of Testing and Materials; and,
- The applicable California Occupational Safety and Health Act (Cal-OSHA) requirements.

The refinery 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.

VIII.a) Operation of the existing Tank 710 and its proposed replacement, a pressurized sphere, will involve the storage of sour water that contains both H_2S and NH_3 in aqueous solution. There will be an increase in the concentration of H_2S and a decrease in the concentration of NH_3 in the sour water after Tank 710 is replaced.

The H_2S concentration in the sour water will increase because condensed stripping steam from the new No. 51 VDU vacuum distillation tower will come into contact with a gas stream that contains H_2S so that H_2S will be dissolved in the condensed steam. Stripping steam is not used in the existing vacuum distillation tower. As a result, the concentration of H_2S in the sour water will increase to approximately 8,500 ppmw from the existing average concentration of approximately 7,500 ppmw. Alternatively, by replacing the existing vacuum distillation tower with the new tower, the NH_3 concentration in the sour water will decrease from approximately 7,900 ppmw to 6,000 ppmw due to changes in the flow of materials processed in the No. 51 VDU.

The maximum amount of H_2S and NH_3 contained in the proposed new sour water tank will decrease after the new sphere is installed, because the new pressurized sphere will be smaller (40,600-barrel capacity) than the current 56,000-barrel-capacity of the existing Tank 710. Maximum quantities of H_2S and NH_3 in the new pressurized spherical tank will be approximately 121,000 pounds and 85,000 pounds, respectively. The proposed project will reduce the maximum amounts of H_2S and NH_3 in the sour water tank by 24,000 pounds and 67,000 pounds, respectively.

The hazardous (flammable) substances associated with the proposed project as well as from the existing conditions at the refinery are petroleum crude and the products from the No. 1 Crude Unit, the new vacuum distillation tower at the No. 51 VDU, and the Butane Tank Car Loading Racks. For the No. 1 Crude Unit, the products include raw light gasoline, raw heavy gasoline, raw jet fuel, raw diesel, gas oil and atmospheric residual. Products associated with the No. 51 VDU include light gas oil, heavy gas oil, vacuum diesel, and vacuum residual. Products associated with the Butane Tank Car Loading Rack include normal butane and iso-butane. The No. 1 Crude Unit, the No. 51 VDU, and the Butane Tank Car Loading Rack are closed systems. Because they are closed systems, other than the small fugitive releases discussed previously in III b) and c) (Air Quality), there are no routine emissions of H_2S, NH_3, flammable liquids, flammable gases, or other hazardous substances from these process units. Additional routine emissions of H_2S, NH_3, flammable or other hazardous materials are not anticipated from the new pressure relief valve systems proposed for the No. 1 Crude Unit or for the Butane Tank Car Loading Rack. Releases of substantial quantities of hazardous substances can only occur during upset conditions.

VIII.b) The following paragraphs discuss the hazards impacts associated with reasonably foreseeable upsets involving: 1) the new sour water spherical surge tank; 2) the new vacuum distillation tower at the No. 51 VDU; 3) the modified pressure relief valves at the No. 1 Crude Unit; and 4) the modified pressure relief valves at the Butane Tank Car Loading Rack.

Impact of Upset Release of H_2S and NH_3 from the New Sour Water Spherical Surge Tank

The potential hazards to the public from the existing sour water tank (Tank 710) and its proposed replacement, the new sour water spherical tank, are due to the potential for a breach of the tank, forming a pool from which NH_3 and H_2S could evaporate and travel off-site. The evaporation rate of NH_3 and H_2S from a liquid spill is a function of the exposed surface area of the spill surface, the wind speed, the ambient temperature, and the concentrations of NH_3 and H_2S in the spilled material. The primary means to reduce the emission rate for a liquid spill is to limit the potential surface area for a given spill scenario. A release scenario with a smaller exposed surface area will have a lower emission rate than a spill with a larger surface area, given comparable spills, meteorology and underlying surface conditions.

The existing sour water tank does not have a containment berm surrounding it. As part of the proposed project, BP plans to install a containment wall around the new spherical surge tank with a concrete-paved interior surface. The height of the containment wall will be a minimum of three feet with a total surface area of approximately 11,000 square feet. This volume is sized to hold deluge water, plus liquid from a two-inch pipe rupture, for a minimum of two hours. In the event of a catastrophic failure of the new spherical tank, the volume of sour water released will exceed the capacity of the containment area and thus will spread outside the containment structure.

Therefore, for a catastrophic breach of either the existing tank or the proposed new sphere, sour water released from either tank would spread horizontally and form a shallow pool. NH_3 and H_2S would then evaporate from the surface of the spilled sour water, potentially producing an off-site impact. Under a "worst-case" release involving a catastrophic failure of either the existing or new tank, the entire contents of the sour water tank will spill. Because the existing sour water tank is larger than the proposed new tank, the existing tank would produce a maximum spill with a larger surface area than the maximum spill from the new spherical tank.

Since the evaporative emission rate from a liquid pool is a function of the pool surface area, the existing sour water surge tank would have a larger maximum evaporative emission rate in the event of a catastrophic failure than would the new spherical tank. In the event of a less-than-total failure of the tank, similar volume spills can be assumed to produce a smaller liquid pool for the new spherical tank because of the containment structure around the new tank. Therefore, under a release scenario involving less-than-total failure of the tank, the pool size and emission rate will likely be less for the new spherical tank when compared to the existing sour water surge tank.

The distance to endpoint for a toxic release (i.e., the downwind distance at which the ambient impact falls below the toxic significance threshold) is a function of the emission rate. Therefore, the potential hazards to the public caused by a "worst-case" spill from the new sour water spherical tank after implementation of the proposed project will be less than or equal to the hazards from the existing sour water tank, and the hazard impact of an accidental release from the proposed new sour water spherical tank is expected to be less than significant. For this reason, no off-site consequence modeling is required to demonstrate this reduction in the potential maximum off-site impact.

The probability of a sour water tank failure will be reduced by replacing the existing Tank 710 with a new spherical pressurized tank. Pressurized storage tanks are constructed more solidly than atmospheric tanks in order to maintain a pressure above atmospheric levels in the tank. The mean time to catastrophic failure for a metallic tank that operates at atmospheric pressure is 0.985 failures per one million hours of service (one failure per approximately 115 years). For a metallic pressurized tank, the catastrophic failure rate is lower at 0.0109 per million hours (one failure per approximately 10,500 years) (AIChE, 1989). Therefore, there will be a substantially reduced probability of a catastrophic failure of the new sour water spherical tank once the proposed project is constructed.

The risk to an off-site individual from a toxic release is a function of both the consequence of the release and the probability of that consequence occurring. Because the hazard of an off-site consequence posed by a failure of the new sour water spherical tank is less than or equal to that from the existing sour water tank, and because the probability of a tank failure will be reduced through project implementation, the proposed project is expected to lead to a reduction in risk to the public from the sour water collection tank at the Carson Refinery.

Impact of Upset Release of Flammable Substances from the Proposed New Vacuum Distillation Tower for the No. 51 VDU

The proposed new vacuum distillation tower at the No. 51 VDU will be a one-for-one replacement of an old tower with a new, more modern tower. The replacement will not result in a significant change in the type of hazardous substances in the tower, which consist of raw light gasoline, raw heavy gasoline, raw jet, raw diesel, gas oil, vacuum diesel, vacuum residual, and atmospheric residual. The new vacuum distillation tower will have a liquid capacity that is approximately 40 percent greater than the existing tower and a production rate that is approximately five percent greater. The amount of potentially flammable liquids and gases within the new vacuum distillation tower at any one time will be slightly greater than with the existing, smaller tower. The new vacuum distillation tower will be more efficient, and operate more reliably and safely and with less maintenance than the existing tower.

The probability of a "worst-case" release from the No. 51 VDU will be reduced with the construction of the new vacuum distillation tower. As the existing tower is over 50 years old and is approaching the end of its useful life, it will be replaced by a new tower. Because the probability of catastrophic failure of a pressure vessel is a function of the age, maintenance history and operating history of the vessel, a new vessel has a lower probability of failure in a given year than does a 50+-year old vessel. Therefore, given similar operating schedules for the existing and new vacuum distillation tower, the new vacuum distillation tower will have a lower probability of catastrophic mechanical failure than does the existing tower.

The following paragraphs discuss the impacts of potential releases of gaseous materials and liquids from the new vacuum distillation tower.

Impact of a Gaseous Release from the Proposed New Vacuum Distillation Tower for the No. 51 VDU

A gaseous release from the existing or new vacuum distillation tower can only occur due to a containment breach of the pressure vessel. The "worst-case" release scenario for the vacuum distillation tower is a vapor explosion in the vapor space of the tower. The vapor generated in the vacuum tower during distillation can be approximated as the vapor from diesel oil. Since both the new and the old vacuum distillation towers operate under significant vacuum (less than 100 millimeter of mercury [mm Hg] absolute), the amount of vapor in the vapor space will be limited. BP has estimated that the amounts of vapor in the vapor spaces are approximately 500 pounds for the existing tower and 1,200 pounds for the new tower.

Under the methodology established for off-site consequence analysis for the Risk Management Program (RMP) under 40CFR68 (EPA, 1999), a gaseous release will produce a vapor explosion that is assumed to produce a blast impact. The significance threshold for a blast impact is an overpressure of 1.0 pounds per square inch (psi). Following the RMP methodology, the distance-to-threshold impact for the existing and new vacuum distillation towers were computed as presented in Appendix C, and the results are presented in **Table 2-23**. The blast impact distance-to-threshold is approximately 40 percent farther for the proposed project release scenario than for the scenario involving the existing vacuum distillation tower. However, neither release scenario

produces an impact that exceeds the significance threshold at the property line of the refinery. Therefore, no off-site impact is expected for a release from either the existing vacuum distillation tower or the proposed new vacuum distillation tower. Further, the new vacuum distillation tower will have no significant hazards impacts from a gaseous release. As the risk posed by a release scenario is a function of both consequence and probability of that consequence, risk will be lower with the new vacuum distillation tower than with the existing vacuum distillation tower because the potential impacts do not extend off-site and the proposed new vacuum distillation tower will have a lower probability of catastrophic mechanical failure than does the existing tower.

Table 2-23
Distance to Impact Threshold for Vapor Explosion at the Existing and Proposed New Vacuum Distillation Towers for the No. 51 VDU

Parameter	Existing Tower	Proposed New Tower
Mass of Vapor in Vapor Space in pounds (lbs)[1]	500	1,200
Overpressure Impact Distance in meters (m)[2]	100	140
Distance to Property Line (m)	240	285
Off-site Impact Distance (m)	0	0

[1] Vapor is assumed to have properties similar to that of vapor from diesel oil
[2] Distance to overpressure impact of 1 pound per square inch (psi)

Impact of a Liquid Release from the Proposed New Vacuum Distillation Tower for the No. 51 VDU

A liquid release from the existing or new vacuum distillation tower can only occur due to a containment breach of the pressure vessel or a breach in a liquid line leading to or from the vessel. Spilled liquid is assumed to spread on the ground, forming a liquid pool and catching fire from an ignition source. There is no containment structure around the existing vacuum distillation tower nor is there one proposed for the new vacuum distillation tower. However, there are significant ground obstacles around the base of each vacuum distillation tower that may limit the spread of liquid during a release. Given the similar throughput of the existing and new vacuum distillation towers (the new vacuum distillation tower is expected to have a production rate five percent greater than the existing vacuum distillation tower), the size of liquid pools resulting from a given release scenario is likely to be similar for each scenario and to produce similar distance to impact. The RMP methodology produces similar thermal impact distances for scenarios consisting of the release of six minutes of throughput volume (as diesel) spreading across a pool of 10,000 square feet for the existing tower and 10,500 square feet for the new tower, as presented in Appendix C. Within the nearest 10-meters, the impact distances for both release scenarios are identical and the differences are within the inherent uncertainty of the RMP computation methodology. Consequently, there will be no significant change in the impact distance posed by a liquid release

and pool fire from the proposed new vacuum distillation tower as compared to existing conditions at the refinery.

Because the proposed new vacuum distillation tower will have a lower probability of catastrophic mechanical failure resulting in a release than does the existing vacuum distillation tower and the impact distances are the same, the overall risk to off-site individuals posed by the proposed new vacuum distillation tower is expected to be less than or equal to the risk posed by the existing vacuum distillation tower, and the impact will be less than significant.

Impact of Upset Releases from the No. 1 Crude Unit with Modified Pressure Relief Valves

Under current conditions, when the pressure in the refinery's No. 1 Crude Unit exceeds the pressure set-point for the pressure relief valves, the valves open and flammable gases from the unit are vented to the atmosphere. The flammable gases potentially released from the No. 1 crude unit consist of vaporized naphtha containing steam and H_2S at a concentration less than 25 ppmw. After implementing the proposed project, gas vented from pressure relief valves throughout the No. 1 Crude Unit will be discharged into a new 24-inch pressure relief header. After liquids have been removed by a new knockout drum, the gases contained in the new pressure relief header will be routed to the refinery's existing No. 5 Flare system. Consequently, implementation of the proposed project will reduce the potential for the atmospheric release of H_2S and flammable gases. The reduction of emissions in the event of excess pressure buildup in the No.1 Crude Unit is the reason the pressure relief valve system is being modified as part of the proposed project. No significant hazard impacts are expected as a result of the modifications proposed for the No.1 Crude Unit pressure relief valve system.

Potential Hazard from the New No. 1 Crude Unit Pressure Relief Header

If the proposed new pressure relief header were to fail, the vent stream released will be essentially the same as what would occur during a pressure relief valve venting event at the existing No. 1 Crude Unit. Although it is possible, but unlikely, that the vent stream could ignite, the portion of the proposed project associated with the new pressure relief header will not change the amount or type of hazardous substances that may be released to the air. Thus, the proposed new pressure relief header will not increase the consequences of a release.

The consequence of a failure for the proposed new 24-inch relief header at the No. 1 Crude Unit will not be materially different from the consequence posed by the existing pressure relief venting system. Under current conditions, gases from the unit are vented to the atmosphere if the pressure rises above the pressure relief valve set-point of 47 psig. For the proposed modifications to the pressure relief system, these same gases would be released to the atmosphere if the new pressure relief header failed while the pressure relief valves were open. However, with the proposed project, two failures would be needed for a release to the atmosphere to occur (an excessive pressure rise in the unit plus a simultaneous failure of the new pressure relief header), whereas currently only one failure is required for such a release (excessive pressure rise in the existing unit). Because the occurrence of two simultaneous failures is less likely than one failure, the potential hazards will be less with the proposed project than under existing conditions and thus, the

impacts of the portion of the proposed project to construct and operate the new pressure relief header will be less than significant.

Impact of Upset Releases from the Butane Tank Car Loading Rack with Modified Pressure Relief Valves

Under current conditions, when pressures in the Butane Unloading Surge Drum, the Low Line Knockout Drum, and the Butane Repressurizing Vaporizer at the Butane Tank Car Loading Rack exceed the pressure set-points for the pressure relief valves, the valves open and flammable butanes are vented to the atmosphere. It is possible, but unlikely, that the vent stream could ignite. After implementing the proposed project, gas vented from pressure relief valves will be discharged into an existing pressure relief header and routed to the refinery's existing Coker Flare system. Consequently, implementation of the proposed project will reduce the potential for the atmospheric release of flammable gases. Reduction of emissions released to the atmosphere in the event of excess pressure buildup in the Butane Tank Car Loading Rack system is the reason for the proposed modifications to the pressure relief valve system. No significant hazard impacts are expected as a result of the proposed modifications to the Butane Tank Car Loading Rack pressure relief valve system.

Based upon these analyses, when considered individually and together, potential impacts from upset releases from the four components of the proposed project will be less than significant.

VIII.c) No existing or proposed schools are located within one-quarter mile of the proposed project site. Therefore, the proposed project will not create hazardous emissions, or handle hazardous or acutely hazardous materials, substances or waste within one-quarter of a mile of an existing or proposed school.

VIII.d) Government Code §65962.5 refers to a list of facilities which may be subject to the Resource Conservation and Recovery Act (RCRA) corrective action program. The Carson Refinery is listed on the RCRA database as a State Equivalent of Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) site (CALSITE) and as a leaking underground storage tank (LUST) site. Hazardous wastes from the facility are managed in accordance with applicable federal, state, and local rules and regulations. However, operation of the proposed project will not change the volumes or types of hazardous wastes generated at the refinery. Accordingly, the proposed project will have no significant adverse hazards impacts related to the disposal of hazardous materials.

VIII.e) & f) The proposed project is not located within an airport land use plan or within two miles of a public airport, public use airport or a private airstrip. As a result, the proposed project is not expected to create hazard impacts in the vicinity of any local airports.

VIII.g) The refinery operators have prepared a Risk Management Program (RMP) for the hazardous materials (butane, pentane and NH_3) that are currently used at the facility**.** The County of Los Angeles Fire Department (FD) administers this program through the California Accidental Release Prevention (CalARP) program. In addition, the refinery operators have prepared an Emergency Response Manual (ERM). This manual describes the emergency response procedures

that will be followed in the event of any of several release scenarios and the responsibilities for key response personnel. Included in the ERM are release scenarios involving H_2S and NH_3.

The ERM will be modified prior to the start of operation of the proposed project to include emergency response procedures and responsibilities in the event of a release of hazardous substances. After the modifications are made, the proposed project will not impair implementation of or physically interfere with an adopted emergency response plan or emergency evaluation plan.

There are three factors that determine the applicability of CalARP and RMP regulations to processes involving NH_3 and H_2S: 1) quantity, 2) mixture fraction, and 3) vapor pressure. In terms of quantity, the new sour water spherical surge tank is expected to involve more than the CalARP threshold quantity ofNH_3. The threshold quantity of NH_3 (both aqueous and anhydrous forms) is 500 pounds under CalARP; the RMP threshold is 10,000 pounds for anhydrous ammonia and 20,000 pounds for aqueous ammonia in a concentration of 20 percent or greater. The threshold quantity of H_2S under the CalARP program is 500 pounds, while under RMP it is 10,000 pounds. Mixtures of H_2S and NH_3 are exempt from CalARP and RMP if the weight fraction of the substance is less than one percent. Finally, NH_3 and H_2S are exempt if their partial pressure is less than 10 mm mercury (Hg). The applicability of RMP and CalARP to the proposed project will be based on a detailed analysis of the three factors identified above specifically for the new sour water tank (Tank 710).

Modifications under the RMP and CalARP are required for covered processes if changes to usage or the process can reasonably be expected to produce a change by a factor of two in the distance to the endpoint for the off-site consequence analysis. Modifications are also required if there is a major change to the process requiring a new process hazard analysis. BP will conduct a detailed review of the proposed project in order to determine the applicability of the CalARP and RMP regulations to the proposed project and the potential need to modify the Refinery's RMP and CalARP plans if the processes are covered.

As part of the review of the proposed project under the RMP and CalARP programs, a process hazard analysis will be conducted to verify the materials and engineering adequacy of the proposed modifications. In addition, the refinery Management of Change procedures under the RMP and Process Safety Management (PSM) programs will require a review of the changes to ensure that no unexpected or adverse interactions with existing systems occur. Such reviews are required as part of the RMP, CalARP, and PSM programs for covered processes. It is expected that such reviews will take place if the threshold quantities of regulated substances are exceeded in any of the four elements of the proposed project (i.e., the new sour water spherical surge tank, new vacuum distillation tower in the No. 51 VDU, and modified pressure relief valves for the No. 1 Crude Unit and Butane Tank Car Loading Rack).

VIII.h) The proposed project site is located in an urban area. No wildlands are located in the immediate or surrounding area. As a result, there will be no risk of loss, injury or death involving wildland fires, and thus no potential significant adverse impact.

VIII.i) Operation of the proposed project does not include new combustion sources. Additionally, operation of the proposed project will not involve the use of flammable substances 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. Although the quantity of flammable substances present in the headspace of the proposed replacement vacuum distillation tower for the No. 51 VDU will be greater than the quantity present in the headspace of the existing vacuum distillation tower, the increase will not be large enough to significantly increase fire hazards. Thus, operation of the proposed project will not significantly increase fire hazards in areas with flammable materials.

Mitigation Measures

Based upon these considerations, significant adverse hazards and hazardous materials impacts are not anticipated. Since no significant hazards and hazardous materials impacts were identified, no mitigation measures are required or necessary.

	Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
IX. HYDROLOGY AND WATER QUALITY. Would the project:			
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☑
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☑
c) Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?	☐	☐	☑
d) Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	☐	☑	☐

	Potentially Significant Impact	Less Than Significant Impact	No Impact
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☑	☐
f) Otherwise substantially degrade water quality?	☐	☐	☑
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☑
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☑
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☑
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☑
k) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☑
l) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑
m) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑
n) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☑

	Potentially Significant Impact	Less Than Significant Impact	No Impact
o) Require a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☑

Significance Criteria

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

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project would result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The project would exceed the capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

Water Demand:

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

Environmental Setting and Impacts

The Carson Refinery obtains its water from a combination of sources. These sources include:

a) potable water (purchased from the California Water Service (which obtains its water from its own wells and from the Metropolitan Water District),

b) non-potable service water from BP's own wells, and

c) reclaimed water.

In 2004, the refinery used an average of approximately 12.5 million gallons per day (mgd). Of this total, approximately 3.9 mgd (approximately 31 percent) came from BP's own wells;

approximately 2.8 mgd (approximately 22 percent) was reclaimed water, with potable water accounting for approximately 5.8 mgd (approximately 46 percent).

Wastewater streams from the refinery include process wastewater, boiler blowdown, sanitary wastewater, and surface runoff. Process wastewater and surface water streams are treated by refinery wastewater treatment facilities prior to discharge to the Los Angeles County Sanitation District's sewer system; the sanitary wastewater stream is discharged directly to the sewer without prior treatment. Average flows to the sewer system are approximately 4.7 mgd. The refinery is also permitted to discharge stormwater commingled with treated process water to Dominguez Channel. The refinery's permit contains mass limits for stormwater discharge to the channel based on a certain flow volume, but does not set volume limits per se. If concentrations of contaminants are lower than permit limits, the refinery can discharge more water without exceeding the permit mass limits. However, if concentrations are higher than permit limits, then discharge volumes must be lower to avoid exceeding the permit mass limits. Though the refinery is permitted to discharge 2.87 mgd of boiler blowdown to Dominguez Channel, no boiler blowdown is currently discharged to the channel. The location where the refinery can discharge to the channel is at an outfall point approximately 2,200 feet west of the Alameda Street Bridge.

IX.a), f), k), & l) Construction of the proposed project will require up to approximately 200 gallons per day of water, primarily for fugitive dust control during excavation for foundations. Because watering for dust control is intended to moisten, but not saturate the soil, runoff from this activity is anticipated to be minimal. Therefore, water application during construction of the proposed project is not expected to produce wastewater that would degrade water quality.

Operation of the new sour water spherical tank, new No. 51 VDU, and modified pressure relief valves for the No. 1 Crude Unit and the Butane Tank Car Loading Rack will not consume additional water above current levels. Other than the additional 1,380 gallons per hour (equivalent to approximately 33 bph) of sour water that will be generated at the new vacuum distillation tower, the proposed project will not generate additional wastewater. The two existing sour water strippers at the refinery are currently processing approximately 550 bph each. The combined system has a demonstrated capacity of over 1,200 bph. The incremental flow from the proposed project will be approximately 33 bph, which when combined with existing flows is within the capacity of the existing strippers. Therefore, operation of the proposed project is not expected to produce process wastes that would violate water quality standards or waste discharge requirements, otherwise degrade water quality, exceed regulatory wastewater discharge requirements, or require the construction of new or expansion of existing wastewater treatment facilities.

Rainfall runoff during both construction and operation of the proposed project will be collected in the Refinery's existing stormwater treatment system. The clean water sewer system is designed to collect only clean storm water runoff. This sewer discharges to the Dominguez Channel under the State of California Industrial Activities Stormwater General Permit (General Permit) for the refinery. During normal dry weather operation, a valve in the main sewer line is closed and locked. During storm conditions, facility personnel inspect the sewer box upstream of this valve to determine the quality of accumulated water. If the water meets the conditions of the refinery's NPDES stormwater permit, the valve is opened. If the water quality is questionable, a vacuum truck is used to transfer the water to the process sewer system. Therefore, stormwater runoff

during construction and operation of the proposed project will not lead to violations of water quality standards or waste discharge requirements, otherwise degrade water quality, or require the construction of new or expansion of existing wastewater treatment facilities.

IX.b), c), d) e), n), & o) As stated previously, construction of the proposed project is anticipated to require no more than 200 gallons per day of water, and operation of the proposed project will not require additional water. The refinery currently uses 12.5 million gallons per day of water. Because water demand for proposed project construction is minimal in comparison with current refinery use, because most of the water needed during project construction will be used for dust suppression and is expected to be either non-potable water from BP's wells or reclaimed water, and because no additional water will be required during project operation, the proposed project is not expected to substantially deplete groundwater supplies, require new or expanded water entitlements, or require construction or expansion of new water supply facilities.

Almost all of the proposed new and modified refinery equipment will be constructed entirely at locations that already are paved or that contain existing equipment. A combined total of less than 0.4 acre of currently unpaved land will become impermeable at all three proposed project locations. Because the proposed project will introduce few new impermeable surface features, the proposed project would not interfere substantially with groundwater recharge.

Since the project will introduce only minor changes in surface features and render little new land area impermeable, changes in drainage patterns are not expected to result in substantial erosion, siltation or flooding either on-site or off-site. Additionally, the refinery's existing storm water collection system has adequate capacity to prevent erosion or flooding. Because the project will involve minimal change in impermeable surface features, it will cause little if any increase in storm water runoff. Therefore, the proposed project is not expected to create or contribute runoff water that will exceed the capacity of the existing storm water drainage system or require the construction or expansion of the existing facilities.

IX.g), h), i) j), & m) The site of the proposed project is located outside the boundaries of possible inundation for a 100- to 500-year flood event along the Los Angeles River. Potential flooding hazards along other, much smaller drainages adjacent to the site are considered to be extremely low. The proposed project will not place housing or other structures within a 100-year flood hazard area and will not expose people or structures to a significant risk of loss, injury or death involving flooding.

The refinery is not on an embayment, so the potential for seiching is less than significant. The refinery is located about four miles from the coast, so there would be no significant tsunami impact potential. Because the refinery site is in a flat area with no hills or mountains nearby, the potential for adverse impacts from mudflows would be less than significant. As the proposed project would be constructed at an existing refinery and would involve few new surface features (i.e., structures, equipment, or paved areas), no significant change in stormwater runoff, drainage patterns, groundwater characteristics or flow would result, and no new or expanded stormwater drainage facilities would be needed.

Mitigation Measures

Based upon these considerations, significant adverse hydrology and water quality impacts are not anticipated. Since no significant hydrology and water quality impacts were identified, no mitigation measures are required or necessary.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
X.	**LAND USE AND PLANNING.** Would the project:			
a)	Physically divide an established community?	☐	☐	☑
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☑
c)	Conflict with any applicable habitat conservation or natural community conservation plan?	☐	☐	☑

Significance Criteria

Land use and planning impacts will be considered significant if:

- The project conflicts with the land use and zoning designations established by local jurisdictions.

Environmental Setting and Impacts

X.a) The proposed project includes improvements and modifications within an existing industrial facility that is zoned and used for heavy manufacturing. The overall activities and products produced at the refinery will remain the same. No new land will be acquired for the project and no zoning and/or land use changes will be necessary. No established communities are located on the refinery property, and consequently, the proposed project will not physically divide an established community.

X.b) The refinery currently operates under a Special Permit (No. 621) granted by the County of Los Angeles prior to the incorporation of Carson as a city. This blanket permit allows BP to establish, operate, and maintain a refinery. Thus, additional permits from Los Angeles County or the City of Carson for the proposed project are not required. The refinery is not located within the Coastal Zone and thus the proposed project is not within the jurisdiction of the California Coastal

Commission. Since the proposed project is consistent with existing zoning and land use at the refinery and with Special Permit No. 621, it does not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the proposed project adopted for the purpose of avoiding or mitigating an environmental effect.

X.c) Because the location of the proposed project is in an industrialized area for which no habitat or natural community conservation plans exist, the proposed project will not conflict with local habitat conservation plans or natural community conservation plans.

Mitigation Measures

Based upon these considerations, significant adverse land use and planning impacts are not anticipated. Since no significant land use and planning impacts were identified, no mitigation measures are required or necessary.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XI.	**MINERAL RESOURCES.** Would the project:			
a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☑
b)	Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☑

Significance Criteria

Project-related impacts on mineral resources would be considered significant if any of the following conditions are met:

- The project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- The project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Environmental Setting and Impacts

XI.a) & b) The proposed project will be constructed on land within an existing industrial site. There are no known mineral resources on the refinery site. Therefore, the proposed project will not result in the loss of a known mineral resource that would be of value to the region and residents of the state. Similarly, because there are no known mineral resources on the project site, the project

will not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Mitigation Measures

Based upon these considerations, significant adverse mineral resources impacts are not anticipated. Since no significant mineral resources impacts were identified, no mitigation measures are required or necessary.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XII.	**NOISE.** Would the project result in:			
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☑	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☑
f)	For a project within the vicinity of a private airship, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☑

Significance Criteria

Impacts on noise would be considered significant if:

- The project causes construction noise levels to exceed local noise ordinances or, if the noise threshold is currently exceeded, the project increases ambient noise levels by more than 3 decibels (dBA) at the site boundary.
- The project causes construction noise levels that exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.
- The project's operational noise levels would exceed the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than 3 dBA at the site boundary.

Environmental Setting and Impacts

The refinery is located within the City of Carson. Carson's Municipal Code, Ordinance No. 95-1068, limits long-term construction noise (periods of 21 days or more) to 65 dBA in the daytime (7 a.m. to 6 p.m.). In addition, non-urgent and essential construction is generally prohibited without a special permit between 6 p.m. and 7 a.m., and on weekends. If the City Engineer determines that the public health, safety, comfort, and convenience will not be affected during these times, he may grant special permission for certain noise-generating activities.

Carson's ordinance limits operational noise to specific statistical sound levels, L_x, where "L" is the A-weighted sound level that may not be exceeded over "x" percent of the measured time period. The maximum noise level recorded during a noise event is expressed as L_{max}. For example, L_{50} is equal to the level exceeded fifty percent of the time. Carson bases its daytime (7 a.m. to 10 p.m.) limits on a 30-minute period and specifies the limits by zone (Zone 1: Noise Sensitive Areas; Zone 2: Residential; Zone 3: Commercial; Zone 4: Industrial).

Carson operational noise limits are summarized for Zones 2 through 4 (residential, commercial, and industrial) in **Table 2-24**. No areas near the refinery are designated Zone 1. For residential and commercial areas, nighttime (10 p.m. to 7 a.m.) limits are 5 dBA lower. If the existing ambient noise level already exceeds these limits, then the noise limit becomes equal to the existing ambient noise level. In addition, interior (indoor) noise levels are limited to 40 dBA nighttime (10 p.m. to 7 a.m.) and 45 dBA daytime, or the existing ambient noise level in residential dwellings whichever is greater. For sources of tonal or impulsive noise, noise ordinance limits are reduced by five dBA.

The refinery is surrounded by industrial, commercial, transportation, and some residential land uses. The ambient noise environment in the project vicinity is composed of the contributions from equipment and operations within these commercial and industrial areas, from rail activities, from the traffic on the major transportation routes (Interstate 405, 223rd Street, Wilmington Avenue, Sepulveda Boulevard, and Alameda Street), and from other individual activities in the area.

Table 2-24
City of Carson Noise Ordinance Limits

Construction Limit (dBA)	Operations Limit (exterior dBA except where noted)					
Residential: L_{max}=65 (7 a.m. -6 p.m.)	Residential[ab]	L_{50}=50	L_{25}=55	$L_{8.3}$=60	$L_{1.7}$=65	L_{max}=70
	Commercial[ab]	L_{50}=60	L_{25}=65	$L_{8.3}$=70	$L_{1.7}$=75	L_{max}=80
	Industrial[ab]	L_{50}=70	L_{25}=75	$L_{8.3}$=80	$L_{1.7}$=85	L_{max}=90
	Indoor Noise – Residences[b]: 45 day; 40 night					

[a] Residential and commercial nighttime limits (10 p.m. – 7 a.m.) are 5dBA lower. Tonal or impulsive type noise also reduces limit by 5 dBA.
[b] If ambient noise exceed limit then limit is increased to ambient noise.
L_X – A-weighted sound level, L, that may not be exceeded more than"x" percent of the measured time period.
L_{max} – Maximum A-weighted sound level

The nearest noise sensitive receptors to the project are two residential areas located over 0.9 mile from the project locations:

- at the southwest corner of the of the refinery (south of Sepulveda Boulevard and east of Bonita Avenue)
- approximately 0.5 mile northwest of the refinery along Lucerne Street and 223rd Street.

The nearest commercial receptor is located approximately 0.2 mile west and northwest of the refinery, just west of Wilmington Avenue and south of 223rd Street. The nearest industrial receptor is located just west of the refinery and Wilmington Avenue and south of 230th Street.

Previous noise studies and noise measurements were performed in the refinery area in 1984 and 1992 (Dames & Moore, 1985; SCAQMD, 1993) in support of the ARCO Watson Refinery Modernization Project EIR, and ARCO Clean Fuels Projects EIR, respectively. Existing ambient sound levels were evaluated in support of the refinery's Polypropylene project in 1997 (SCAQMD, 1997). The existing community noise exposure level (CNEL) noise environments in the vicinity of the closest residences is 65 to 71 dBA (residences southwest of the refinery and northwest of the refinery, respectively) and are in the "normally unacceptable" range for their land use category (SCAQMD, 1997). The existing CNEL noise environment in the vicinity of the closest industrial and commercial receptors to the west and northwest of the refinery is 71 to 74 dBA, (SCAQMD, 1997), which, as shown in **Table 2-25**, is in the "conditionally acceptable" range for such land use categories.

Table 2-25
Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure			
	Ldn or CNEL[1], dB			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential-Low Density	50-60	60-65	65-75	75-85
Residential-Multiple Family	50-60	60-65	65-75	75-85
Transient Lodging-Motel, Hotels	50-65	65-70	70-80	80-85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-60	60-65	65-80	80-85
Auditoriums, Concert Halls, Amphitheaters	NA	50-65	NA	65-85
Sports Arenas, Outdoor Spectator Sports	NA	50-70	NA	70-85
Playgrounds, Neighborhood Parks	50-70	NA	70-75	75-85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50-70	NA	70-80	80-85
Office Buildings, Business Commercial and Professional	50-67.5	67.5-75	75-85	NA
Industrial, Manufacturing, Utilities, Agriculture	50-70	70-75	75-85	NA

Source: City of Carson; modified from U.S. Department of Housing and Urban Development Guidelines and State of California Standards.

NOTES:

NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE
New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

[1] L_{dn} is an average A-weighted noise level during a 24-hour day with 10 dB added to levels measured between 10 pm and 7 am. CNEL is similar to L_{dn} except that CNEL also adds 5 decibels to levels between 7 pm and 10 pm

KEY: NA= Not Applicable

XII.a), b), c) & d)

Construction Impacts

Construction equipment that will be used for the proposed project will be similar in type to the equipment used in the ARCO Polypropylene, Clean Fuels, and CARB Phase 3/MTBE Phase-out Projects (SCAQMD, 1993, 1997, 2001). For this project, the estimate of construction noise at any given period of time is based on construction noise equipment and usage used in the CARB Phase 3/MTBE Phase-out EIR, a project with maximum activity levels at any give time and location for construction equipment as great as or greater than the proposed project. Therefore, data from the Clean Fuels and CARB Phase 3/MTBE Phase-out projects may be considered a conservative "worst-case" construction equipment scenario for the proposed project. A summary of construction equipment types and estimated reference sound pressure levels is presented in **Table 2-26**.

Table 2-26
Noise Levels of Construction Equipment

Equipment Type	Reference Sound Pressure Levels[a] (dBA at 50 Feet)
Tractor	79
Flat Bed Truck	77
Crane	83
Cherry Picker	85
Welding Machine	76
Backhoe	87
Forklift	80
Air Compressor	81
Generator	79
Concrete Pump	79
Front End Loader	88
Vibratory Roller	79

[a] Based on sound levels used for CARB Phase 3 MTBE Phase-out project (SCAQMD, 2001).

Construction sound level estimates were based on the following assumptions:

- Construction will occur on weekdays during daytime hours,
- Construction equipment to be used is listed in **Appendix A**,
- Equipment operating at any given time will represent 50 percent of the total equipment on-site, and,
- There will be a reduction in six dBA per twice the distance from the center of the construction site to the nearest receptor.

Based on these assumptions, maximum construction noise levels for the proposed project are predicted to be approximately 53 to 54 dBA at the nearest residential receptors, which is well within the local construction noise ordinance limit of 65 dBA. Therefore, construction noise from the propose project is expected to comply with the City of Carson's noise ordinance limits for maximum construction noise for long-term daytime construction.

Table 2-27 presents CNEL estimates of total existing noise, traffic and Carson Refinery components of the current noise environment; predicted proposed project construction noise; and predicted total noise during proposed project construction. Existing CNEL sound levels are based on data used in the ARCO Polypropylene EIR Project (SCAQMD, 1997). Project construction sound levels in **Table 2-27** are the maximum sound levels estimated during project construction at the refinery boundary in the direction of the residential receptor or commercial area (the property line between the project sites and the receptor/commercial area). As shown in **Table 2-27**, project construction noise is expected to increase total CNEL noise levels at the refinery boundary by one dBA or less. Furthermore, proposed project construction activities are not expected to generate substantial ground-borne noise or vibration levels.

Table 2-27
Existing and Estimated CNEL Construction Noise Impacts at the Refinery (dBA)

Site Boundary[b]	Existing CNEL[a]			Maximum Construction Sound Level[c]	Estimated CNEL	
	Refinery	Traffic	Total (Ambient)		Total[d]	Increase
1. Northwest (4000 feet)	74	66	74	56	74	< 1
2. West (4000 feet)	69	66	71	56	71	< 1
3. Southwest (2500 feet)	51	65	65	60	66	1

[a] Source: SCAQMD 1997

[b] At property line in direction of the nearest noise sensitive receptor area

[c] Based on construction equipment for the ARCO CARB Phase 3/MTBE Phase-out project as presented in the EIR for that project. Values shown are the maximum predicted construction sound pressure levels at the property line in the direction of the residential/commercial area.

[d] Total sound levels are based on decibel addition of Total Existing CNEL and maximum project construction sound levels.

Proposed project-related construction noise levels at the refinery will be within local construction noise ordinance limits and the proposed project is not expected to increase existing noise at the property boundary by more than the significance threshold of three dBA. Based on these factors the proposed project's construction noise impacts are expected to be less than significant.

Potential for Operational Noise Impacts

The only new permanent noise-producing equipment associated with the proposed project will be the installation of a 15-horsepower pump to be used with the new flare knockout drum as part of the No.1 Crude Unit pressure relief valve modifications. The installation of this pump will contribute inaudible increases in noise levels because: 1) the pump has a small power rating; 2) the

pump will be located within the existing refinery noise environment; and 3) the pump will only operate during brief and infrequent occasions when the No. 1 Crude Unit pressure relief valves are open. No new noise sources are associated with the proposed new sour water surge sphere, the new No. 51 VDU or the Butane Tank Car Loading Rack relief valve modifications. In summary, operation of the proposed project is not expected to cause significant increases in the overall noise levels at the refinery itself or at locations outside refinery boundaries.

Potential for Worker Exposure Noise Impacts

Workers exposed to noise sources in excess of 85 dBA are required by OSHA regulations to participate in a hearing conservation program. Workers exposed to noise sources in excess of 90 dBA for an eight-hour period will be required by OSHA regulations to wear hearing protection devices that conform to OSHA/National Institute for Occupational Safety and Health (NIOSH) standards. The Carson Refinery requires employees and contractors to participate in a hearing conservation program and wear hearing protection devices. Participation by employees and contractors in this hearing conservation program and the use of hearing protection devices avoid significant impacts from worker noise exposure.

XII.e) & f) The proposed project is not located within an airport land use plan, a public airport, a public use airport, or a private airstrip, so noise impacts to individuals living or working in the vicinity of airports will not be exacerbated by the proposed project.

Mitigation Measures

Based upon these considerations, significant noise impacts are not expected from implementing the proposed project. Since no significant noise impacts were identified, no mitigation measures are necessary or required.

	Potentially Significant Impact	**Less Than Significant Impact**	**No Impact**
XIII. POPULATION AND HOUSING. Would the project:			
a) Induce substantial growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☑
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☑

	Potentially Significant Impact	Less Than Significant Impact	No Impact
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☑

Significance Criteria

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

- The project will cause a demand for temporary or permanent housing that exceeds the existing supply.
- The project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

Environmental Setting and Impacts

XIII.a), b) & c) Construction of the proposed project will take place over a period of approximately 16 months at an existing refinery located in a highly urbanized and populous area of southern California. At the peak of construction, approximately 199 temporary construction jobs will be created by the proposed project. Because of the large size of the construction work force available in the southern California area, all 199 temporary construction jobs are expected to be filled from the existing regional labor pool. Once construction is completed, no additional staff is expected to be needed at the refinery for long-term operation of the proposed project. Thus, the proposed project will not induce substantial growth either directly or indirectly.

Because the proposed project will occur within an existing facility located in a highly urbanized area, no additional housing will be necessary to accommodate the labor force needed during construction and further, no existing housing will be displaced. Substantial housing growth in the area will not occur as a result of the proposed project. Therefore, no impacts are expected to result from the proposed project.

Mitigation Measures

Based upon these considerations, significant adverse population and housing impacts are not anticipated. Since no population and housing impacts were identified, no mitigation measures are required or necessary.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES. Would the proposal result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:			
a) Fire protection?	☐	☐	☑
b) Police protection?	☐	☐	☑
c) Schools?	☐	☐	☑
d) Parks?	☐	☐	☑
e) Other public facilities?	☐	☐	☑

Significance Criteria

Impacts on public services would be considered significant if:

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

Environmental Setting and Impacts

XIV.a) To respond to emergency situations, the Carson Refinery maintains an on-site fire department, which is supplemented by the resources of public fire departments, primarily the Los Angeles County Fire Department (FD). There are four Los Angeles County FD stations that serve the Carson area: 1) Station 127 at 2049 E. 223rd Street; 2) Station 10 at 1860 E. Del Amo; 3) Station 36 at 127 W. 223rd Street; and, 4) Station 116 at 755 E. Victoria. Construction of the proposed project, specifically the installation of the new sour water spherical tank and new vacuum distillation tower, is likely to require an update to the Refinery's Risk Management Program (RMP), which would be coordinated with the Los Angeles County FD. However, the proposed project during both construction and operation will not create the need for additional fire protection services.

XIV.b) The refinery has an on-site security department that provides protective services for people and property within the refinery bounds. Because the proposed project will not change refinery staffing or substantially expand the existing facilities within the refinery such that there will be no increased need for new or expanded police protection.

XIV.c), d) & e) The proposed project will not require additional operational staffing at the refinery. Thus, there will be no increase in local population, and no impacts are expected to schools, parks, or other public facilities as a result of the proposed project.

Mitigation Measures

Based upon these considerations, public services impacts are not anticipated. Since no public services impacts were identified, no mitigation measures are required or necessary.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XV. RECREATION.			
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☑
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☑

Significance Criteria

The impacts to recreation would be considered significant if:

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

Environmental Setting and Impacts

XV.a) & b) There will be no changes in population size or densities resulting from the proposed project and thus, implementation of the proposed project will not cause an increase in the use of existing neighborhood and regional parks or other recreational facilities. Further, the proposed project will be located at an established industrial facility and will have no effect on existing nearby parks or other recreational facilities. The proposed project also will not require the construction or expansion of recreational facilities and, thus, will not have an adverse physical effect on the environment.

Mitigation Measures

Based upon these considerations, significant adverse recreation impacts are not anticipated. Since no significant recreation impacts were identified, no mitigation measures are required or necessary.

	Potentially Significant Impact	Less Than Significant Impact	No Impact
XVI. SOLID/HAZARDOUS WASTE. Would the project:			
a) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☑	☐
b) Comply with federal, state, and local statutes and regulations related to solid and hazardous waste?	☐	☐	☑

Significance Criteria

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

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

Environmental Setting and Impacts

XVI.a) & b) During 2004, the refinery transported off-site for disposal approximately 9,705 tons of waste. Data identifying the categories of waste disposed represent approximately 95 percent of this total and are shown in **Table 2-28**. **Table 2-29** lists several disposal sites that received these wastes and the corresponding data for each type of disposal facility plus their respective remaining and permitted capacities.

Table 2-28
Off-site Waste Shipments from the Carson Refinery During 2004

Waste Description	Quantity (Tons)
Non-Hazardous Soil	4,473
Spent Catalyst (non-RCRA)	1,883
Spent Catalyst (RCRA)	939
Asbestos Containing Material (including Soil)	1,068
Oil/Water/Sludge Separation Solids (Wastewater)	203
Oily Production Trash	184
Spent Non-Hazardous Catalyst	166
Spent Carbon	131
Cooling Tower Debris	51
Total Coke/Charcoal	30
TOTAL	**9,195[1]**

[1] These streams represent approximately 95 percent of the 2004 total of 9,705 tons of wastes shipped off-site for disposal by the refinery.

Table 2-29
Disposal Facilities Used by the BP Carson Refinery

Facility Name	Facility Type	Facility Class[1]	Remaining Capacity (yds^3)	Permitted Capacity (yds^3)
Waste Management – Palmdale (Los Angeles County): Antelope Valley Public Landfill	Solid waste landfill Large volume waste transfer facility	Class III	2, 980,000	6,480,000
Waste Management - Azusa, (Los Angeles County): Azusa Land Reclamation Co. Landfill	Inert waste disposal site Major waste tire facility ACM disposal site Contaminated soil facility Solid waste disposal site	Class III	34,100,000	66,670,000
Waste Management - McKittrick, (Kern County)	Solid waste disposal site	Class II	841,000	N/A
Waste Management - Kettleman, (Kings County)	Solid waste landfill Solid waste treatment facility	Class II, III	3,370,000	4,200,000
Clean Harbors Buttonwillow (Kern County)	Solid waste landfill	Class I	N/A	14,290,000
US Ecology – Beatty, Nevada	Solid waste landfill	Class I	2,740,000	N/A-

[1] A Class I disposal site can accept hazardous wastes, defined as wastes that exhibit certain characteristics (ignitability, corrosivity, reactivity, and toxicity) or appear on certain lists that specify hazardous wastes. A Class II disposal site can accept "designated wastes", which include hazardous wastes that are not required to be disposed at Class I disposal facilities and non-hazardous waste posing a greater threat to water quality than non-hazardous solid waste. A Class III disposal site can accept only non-hazardous sold waste, often referred to as municipal solid waste.
KEY ACM = asbestos containing materials N/A = data not available

Construction activities associated with the proposed project will increase the amount of solid waste generated and disposed. For example, replacement of the existing No. 51 VDU will involve some demolition activities that will generate waste from the following tasks:1) removal of a concrete operator shelter building to make room for the new vacuum ejector system; 2) removal of the paved parking lot that currently exists at the site of the proposed new vacuum distillation tower (150 feet north of the old tower); 3) demolition of the foundations for the old heaters; and, 4) removal of the carbon steel pipe associated with the disconnecting the service of the existing vacuum distillation tower. Similarly, installation of the new sour water spherical tank will require demolition of the foundation of the existing sour water tank (Tank 710). These demolition activities will generate waste consisting of concrete (i.e., several hundred concrete masonry blocks and approximately 300 cubic yards of demolition concrete), small amounts of asphalt, and approximately 600 pounds (6,000 linear feet) of carbon steel pipe. Minimal waste-generating demolition activities will be associated with the proposed modifications to the No. 1 Crude Unit and Butane Tank Car Loading Rack pressure relief valves. Some demolition materials, such as carbon steel pipe, will be recycled whenever feasible.

The Carson Refinery has an alliance arrangement with Waste Management, Inc. to handle most types of waste generated at the refinery. The refinery has a well-developed waste handling system to maximize recycling such as the following: 1) employee use of different colored containers (e.g., yellow for common trash, blue for aluminum cans, green for oil process trash) to allow easy separation of waste materials; 2) a main recycling area within the refinery where materials such as large batteries, electronic wastes, and fluorescent lamps are collected; and, 3) indoor recycling collection areas for materials such as small batteries and toner cartridges.

Construction of the proposed project will also generate up to two 55-gallon drums per week of normal construction debris such as wood, cardboard, paper, plastic, et cetera. Non-recyclable solid wastes generated during construction of the proposed project will be taken to an appropriately classified disposal facility. As shown in **Table 2-29**, wastes generated at the refinery are taken to several facilities for disposal. Though knowing which specific disposal facility will receive waste cannot be predicted prior to generating construction debris, sufficient remaining capacity is available at all of the waste disposal facilities that receive Carson Refinery wastes. Thus, the small quantities of non-recyclable solid wastes that are expected to be generated from constructing the proposed project are not expected to exceed the individual capacity of each disposal facility.

Construction of the proposed project is expected to generate small amounts of hazardous wastes, including approximately two to three 55-gallon drums per month of materials such as empty aerosol cans, paint cans, and oil rags, as well as approximately five cubic yards of lead paint wastes. As shown in **Table 2-29**, the relatively small amounts of hazardous wastes expected to be generated will have a minimal impact on the capacity of any disposal facility qualified to receive this type of waste. Further, if contaminated soils are encountered during the excavation phase of the proposed project, the soils will be removed for proper decontamination and disposal in accordance with SCAQMD's Rule 1166 – Volatile Organic Compound Emissions From Decontamination of Soil and BP's Soils Handling Plan. Contaminated soil would be stored at a temporary holding location within the refinery. It would be hauled from this temporary holding location for off-site disposal on weekends, when other construction activities for the proposed

project is not occurring. It is anticipated that it would be hauled to the Azusa Land Reclamation Co. Landfill.

As with the current operations at the refinery, wastes generated by the operation of the proposed project will also be managed and/or disposed of in compliance with applicable federal, state, and local statutes and regulations. The proposed new and modified equipment associated with the proposed project will perform the same functions as the existing equipment without changing the scale of operations, and solid or hazardous waste generation rates will not increase as a result of proposed project operation.

In summary, the small amounts of solid and hazardous wastes that are expected to be generated during the 16-month construction period for the proposed project are not expected to exceed the available capacity of solid or hazardous waste disposal facilities. As noted previously, the operation phase of the proposed project will not change waste generation rates at the refinery. Thus, the proposed project is not expected to result in adversely significant solid waste or hazardous waste impacts.

Mitigation Measures

Based on these analyses, the proposed project is not expected to substantially increase the volume of solid or hazardous waste from construction or operational activities for the proposed project at the Carson Refinery that cannot be handled by existing municipal or hazardous waste disposal facilities. Further, implementation of the proposed project will neither require additional waste disposal capacity nor will it interfere with the project proponent's ability to comply with applicable local, state, or federal waste disposal regulations. Since no significant solid/hazardous waste impacts were identified, no mitigation measures are necessary or required.

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XVII.	**TRANSPORTATION/TRAFFIC.** Would the project:			
a)	Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☑	☐
b)	Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☑

		Potentially Significant Impact	Less Than Significant Impact	No Impact
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☑
d)	Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☑
e)	Result in inadequate emergency access?	☐	☐	☑
f)	Result in inadequate parking capacity?	☐	☐	☑
g)	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	☐	☐	☑

Significance Criteria

The impacts on transportation/traffic would be considered significant if the project causes any of the following to occur:

- Peak period levels on major arterials are disrupted to a point where level of service (LOS) is reduced to D, E or F for more than one month.
- An intersection's volume to capacity ratio increase by 0.02 (two percent) or more when the LOS is already D, E or F.
- A major roadway is closed to all through traffic, and no alternate route is available.
- There is an increase in traffic (e.g., 350 heavy-duty truck round-trips per day) that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.

Environmental Setting and Impacts

The following transportation/traffic discussion is based on a study of the anticipated traffic impacts for the proposed project as prepared by Austin-Foust Associates (AFA) (see **Appendix B** for the full study). The refinery is located on Sepulveda Boulevard in the City of Carson, less than one-quarter of a mile south of the San Diego Freeway (Interstate-405). The refinery is situated between Wilmington Avenue on the west, 223rd Avenue on the north, Alameda Street on the east, and Sepulveda Boulevard on the south. Construction traffic to be generated by the proposed project will access the refinery via Gate 60 located on 223rd Avenue. Wilmington Avenue and

Alameda Street are north-south four-lane divided roadways. Sepulveda Boulevard and 223rd Avenue are east-west four-lane divided roadways in the vicinity of the refinery.

Regional transportation facilities in the vicinity of the refinery provide excellent accessibility. Four major freeways bound most of the refinery vicinity, which is centrally located between two north-south freeways, the Harbor Freeway (Route 110) and the Long Beach Freeway (Route 710). The San Diego Freeway (Interstate 405) lies immediately north of the refinery and runs diagonally throughout the region, and the Redondo Beach Freeway (Route 91) lies further to the north of the refinery and runs east-west. Existing a.m. and p.m. peak hour turning movement volumes for the adjacent street system at study area intersections and existing average daily traffic (ADT) volumes on selected roadway segments were collected by AFA in November 2004 in the vicinity of the proposed project site. Key intersections and roadway segments were counted and compared with the year 2000 counts collected by AFA for the CARB Phase 3/MTBE Phase-out project at the BP refinery. These comparisons indicate a three percent increase in volumes for the year 2004, which is consistent with the Metropolitan Transportation Authority (MTA) forecasts for this area. Hence, intersection volumes at locations not counted were increased by three percent to represent current (2004) volumes.

As shown in **Table 2-30**, most intersections of concern in the project vicinity are presently operating at an acceptable level of service (LOS) during the a.m. and p.m. peak hour under existing conditions.

XVII.a) & b) Construction of the proposed project will generate additional traffic from construction personnel travel, as well as the transportation of construction materials and equipment to the refinery. Because the proposed project will not increase operational phase employment at the refinery or change the level of materials deliveries during operation, the project will have no traffic and transportation impacts during operation. For this reason, the following discussion addresses only potential impacts during construction of the proposed project.

The project is proposed to be constructed over a period of 16 months (July 2005 to October 2006). The construction effort is anticipated to require a maximum of 199 workers per day during the peak month of the construction period (August 2006). Construction activities are anticipated to occur four days a week, with the work scheduled to begin at 6:00 a.m. and end at 4:30 p.m. Thus, traffic attributable to proposed project construction will arrive at the site before the beginning of the 7:00 a.m. to 9:00 a.m. peak period and will not affect a.m. peak hour Intersection Capacity Utilization (ICU) values (also called volume-to-capacity ratio) at the intersections of concern in the site vicinity. Construction traffic will leave the site at 4:30 p.m. and be completely discharged during the peak period on the adjacent streets (4:30 - 5:30 p.m.), and thus might affect the p.m. peak hour ICU values. Therefore, this traffic impact analysis examines impacts attributable to the proposed project only during the p.m. peak hour.

Table 2-30
Existing Traffic Conditions (Intersection Capacity Utilization)

Intersection	A.M.	P.M.
1. Wilmington & I-405 NB on/off	.69	.70
2. Wilmington & I-405 SB on/off	.85	.74
3. Wilmington & 223rd	.74	.83
4. Wilmington & Watson Center	.58	.70
5. Wilmington & Sepulveda	.65	.90
6. Alameda & I-405 NB	.41	.54
7. Alameda & 223/Wardlow Access	.31	.48
8. Alameda & Sepulveda	.52	.85
9. I-405 SB on/off & 223/Wardlow	.38	.49
10. 223rd & Alameda/Wardlow Access	.45	.84
11. Gate 16 & 223rd	.42	.74
12. Gate 60 & 223rd	.38	.75
1. Wilmington & I-405 NB on/off	.69	.70
2. Wilmington & I-405 SB on/off	.85	.74

Level of Service (LOS) ranges:

.00 - .60	A (free flowing)
.61 - .70	B (stable, slight delay)
.71 - .80	C (stable, acceptable delay)
.81 - .90	D (approaching unstable, tolerable delay)
.91 – 1.00	E (unstable flow, at capacity)
Above 1.00	F (forced flow, above capacity/congested)

This analysis conservatively assumes a construction employee vehicle occupancy rate of 1.0 person per vehicle, i.e., no ride sharing to and from the refinery site by construction workers is assumed. Thus, the peak construction work force of 199 workers is expected to result in a maximum of 199 construction worker vehicles entering and exiting the site daily during the peak month of construction.

The average daily truck traffic during construction of the proposed project is forecasted to be three trucks per day. Since these truck trips will mainly consist of material deliveries, they will be spread throughout the workday with few deliveries occurring during the peak hour. Therefore, the contribution of construction truck traffic to overall traffic impacts will be negligible for the proposed project.

Construction vehicles will utilize existing on-site parking areas at the refinery during construction of the proposed project. Impacts from construction traffic were analyzed using the on-site parking location accessible via Gate 60. Construction personnel will enter and leave the construction parking lot from 223rd Street at Gate 60.

To assess potentially adverse impacts, predicted construction traffic volumes were added to the existing intersection volumes and roadway segment volumes. Roadways in the vicinity of the refinery will be temporarily impacted by the construction-related traffic. However, construction traffic will not close a major roadway to all through traffic without an available alternative.

ICU values that will result from traffic volumes for the existing setting plus the proposed project are shown on **Table 2-31**. The table shows that eight of the 12 intersections studied will experience no change in ICU value, and three intersections will experience a change of less than 0.02. However, the construction traffic from the proposed project will increase the p.m. peak hour ICU at the intersection of Gate 60 and 223rd street by 0.07, causing the LOS to change from C to D. This increase in ICU and change in LOS exceed the SCAQMD significance thresholds. Thus, if left unmitigated, construction-related traffic would cause a significant adverse impact.

Volume-to-capacity ratios for freeway "mainlines" (the freeways themselves, not freeway on/off ramps or frontage roads) are summarized in **Table 2-32**. This table shows that construction traffic for the proposed project will have minimal impact on freeway traffic volumes and will not affect the existing levels of service. In summary, the proposed project is not expected to cause significant adverse impacts on traffic within the vicinity of the refinery.

XVII.c) The proposed project will not affect air traffic patterns because the proposed project does not involve construction of any structures greater than 200 feet in height or that would otherwise require notifying the Federal Aviation Administration pursuant to Advisory Circular AC 70/7460-2K.

XVII.d) The proposed project will take place at an existing refinery and will not result in hazards due to road design, hazards to pedestrians, or conflicts with alternative transportation. The proposed project will not alter transportation-designed features or alter current transportation system uses. Therefore, the proposed project will not increase hazards due to design features or incompatible uses.

XVII.e) Emergency access is currently provided throughout the refinery. The proposed project will not alter existing emergency access, nor will it require additional emergency access. Therefore, the proposed project will not result in inadequate emergency access.

XVII.f) The refinery has sufficient available on-site parking for construction worker vehicles, and no additional parking spaces will be required during operation because no additional employees will be required at the refinery as a result of the proposed project.

Table 2-31
Existing Setting + Proposed Project Traffic Conditions
(Intersection Capacity Utilization)

Intersection	Existing Setting P.M. Peak	Existing Setting + Proposed Project P.M. Peak	Percent Change
1. Wilmington & I-405 NB on/off	.70	.70	NC
2. Wilmington & I-405 SB on/off	.74	.74	NC
3. Wilmington & 223rd	.83	.84	.01
4. Wilmington & Watson Center	.70	.70	NC
5. Wilmington & Sepulveda	.90	.90	NC
6. Alameda & I-405 NB	.54	.54	NC
7. Alameda & 223/Wardlow Access	.48	.48	NC
8. Alameda & Sepulveda	.85	.86	.01
9. I-405 SB on/off & 223/Wardlow	.49	.50	.01
10. 223rd & Alameda/Wardlow Access	.84	.85	.01
11. Gate 16 & 223rd	.74	.74	NC
12. Gate 60 & 223rd	.75	.82	**0.07**

Level of Service (LOS) ranges:

.00 - .60 A (free flowing)
.61 - .70 B (stable, slight delay)
.71 - .80 C (stable, acceptable delay)
.81 - .90 D (approaching unstable, tolerable delay)
.91 – 1.00 E (unstable flow, at capacity)
Above 1.00 F (forced flow, above capacity/congested)

Vales in **bold** exceed significance threshold.

Table 2-32
Freeway Mainline Volume-To-Capacity (V/C) Ratio Summary

	Existing Setting			Existing Setting + Proposed Project		
Intersection	**P.M. Peak Hour Demand**	**P.M. Peak Hour V/C**	**P.M. Peak Hour LOS**	**P.M. Peak Hour Demand**	**P.M. Peak Hour V/C**	**P.M. Peak Hour LOS**
1. Wilmington & I-405 NB on/off	7,560	.76	C	7,560	.76	C
2. Wilmington & I-405 SB on/off	6,720	.67	C	6,741	.67	C
3. Alameda & I-405NB ramps	2,890	.29	A	2,897	.29	A
4. I-405 SB on/off ramps & 223rd/Wardlow	3,910	.39	B	3,933	.39	B

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

XVII.g) The proposed project will not alter any existing facilities that support alternative transportation, such as bus turnouts or bicycle racks. The project proponent and the construction contractor will encourage carpooling and the use of alternative transportation by construction workers. No additional employees are anticipated to operate the proposed project. Therefore, the proposed project is not expected to conflict with adopted policies, plans, or programs supporting alternative transportation.

Mitigation Measures

The preceding traffic analysis indicates that the proposed project would cause additional traffic during construction on the roadways and intersections near BP's refinery and result in a significant adverse impact at one intersection (Gate 60 and 223rd Street) during the p.m. traffic peak. The following mitigation measures will be implemented to reduce construction phase traffic impacts to a less than significant level:

Mitigation Measure T-1: Access to and from the construction site will be limited to the access points that were identified and evaluated in the traffic study. The two existing exit lanes leaving the refinery at Gate 60 and 223rd Street will be re-striped to provide an exclusive right-turn lane and a shared left and right turn lane. If the construction plans change such that different access points are proposed, these changes will be evaluated by a

registered Traffic Engineer and submitted to the City of Carson Traffic Engineer for review.

Mitigation Measure T-2: Sufficient parking will be provided on the refinery site to accommodate all the construction employees, and no on-street parking (i.e., off the refinery site) will be permitted;

Mitigation Measure T-3: Delivery of construction materials to the site will be scheduled to occur during off-peak periods (i.e. from 9:00 a.m. until 3:00 p.m.) and/or after 7:00 p.m. and before 7:00 a.m.; and

Mitigation Measure T-4: Truck deliveries of over-sized equipment and materials will be scheduled for non-peak a.m. and p.m. periods (i.e., no such deliveries scheduled in the 7:00 a.m. – 9:00 a.m. and 4:00 p.m. – 6 p.m. periods).

The ICU values for the 12 intersections with implementation of these mitigation measures are listed in **Table 2-33**. **Table 2-33** shows that the changes in ICU and levels of service will not exceed the SCAQMD's significance thresholds with implementation of these mitigation measures and, thus, mitigated impacts on traffic/transportation will be less than significant.

Table 2-33
Mitigated Existing Setting + Proposed Project Traffic Conditions
(Intersection Capacity Utilization)

Intersection	Existing Setting P.M. Peak	Existing Setting + Proposed Project P.M. Peak	Percent Change
1. Wilmington & I-405 NB on/off	.70	.70	NC
2. Wilmington & I-405 SB on/off	.74	.74	NC
3. Wilmington & 223rd	.83	.84	.01
4. Wilmington & Watson Center	.70	.70	NC
5. Wilmington & Sepulveda	.90	.90	NC
6. Alameda & I-405 NB	.54	.54	NC
7. Alameda & 223/Wardlow Access	.48	.48	NC
8. Alameda & Sepulveda	.85	.86	.01
9. I-405 SB on/off & 223/Wardlow	.49	.50	.01
10. 223rd & Alameda/Wardlow Access	.84	.85	.01
11. Gate 16 & 223rd	.74	.74	NC
12. Gate 60 & 223rd	.75	.76	0.01

Level of Service (LOS) ranges:
.00 - .60 A (free flowing)
.61 - .70 B (stable, slight delay)
.71 - .80 C (stable, acceptable delay)
.81 - .90 D (approaching unstable, tolerable delay)
.91 – 1.00 E (unstable flow, at capacity)
Above 1.00 F (forced flow, above capacity/congested)

		Potentially Significant Impact	Less Than Significant Impact	No Impact
XVIII.	**MANDATORY FINDINGS OF SIGNIFICANCE.**			
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☑
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☑	☐
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☑	☐

XVIII.a) The proposed project is not expected to adversely affect plant or animal species or the habitat on which they rely because construction and operation activities for the proposed project would take place at the existing Carson Refinery in areas that already have been greatly disturbed and that currently do not support such habitats or species. Special status plants or animals and natural communities are not expected to be adversely affected. Important examples of the major periods of California history or pre-history are not known or expected to be found at the locations within the refinery where these activities would occur, and thus would not be adversely affected by the proposed project.

XVIII.b) The proposed project at the Carson Refinery will not result in cumulative impacts in conjunction with other ongoing projects that may occur concurrently with or subsequent to the proposed project at or near the refinery. The analysis of each issue area is presented below:

Aesthetics

The proposed project would involve installing new and upgraded refinery equipment that is visually similar to the existing equipment at the Carson Refinery. The proposed project is not expected to have significant project-specific adverse aesthetic impacts and would therefore not result in "cumulatively considerable" impacts.

Agriculture Resources

The proposed project will occur within the existing refinery, which contains no agricultural resources. The proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery are not expected to impact agricultural resources and would therefore not result in cumulatively considerable impacts.

Air Quality

Cumulative air quality impacts were addressed in the discussion under item III.c). Based upon the discussions in III.c), implementation of mitigation measure AQ-1 will reduce cumulative adverse air quality impacts to less than significant.

Biological Resources

The proposed project will occur in highly disturbed areas of the existing refinery that do not contain biological resources. The proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery are not expected to adversely affect biological resources and would therefore not result in cumulatively considerable impacts to biological resources.

Cultural Resources

The proposed project will occur in highly disturbed areas of the existing refinery with no known cultural resources and a low potential for encountering undiscovered cultural resources. Plans for the proposed project incorporate measures designed to minimize the potential for unexpected impacts to cultural resources. The proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery are not expected to adversely affect cultural resources and would therefore not result in cumulatively considerable impacts to cultural resources.

Energy

The proposed project would involve installing new and upgraded equipment that is very similar to the existing refinery equipment. The new and upgraded equipment is expected to be more energy-efficient than the existing refinery equipment. Impacts to energy resources for the proposed project will be less-than-significant during both construction and operation. The proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson

Refinery are not expected to adversely affect energy resources and would therefore not result in cumulatively considerable impacts to energy resources.

Geology and Soils

The proposed project would involve replacing existing equipment with new and upgraded equipment, all of which would occur within the existing facility. The proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery are not expected to adversely affect geology and soil resources and would therefore not result in cumulatively considerable impacts to geology and soils.

Hazards and Hazardous Materials

The proposed project would involve installing new and upgraded refinery equipment that is very similar to the existing refinery equipment. The proposed project is expected to have less than significant impacts related to hazards and hazardous materials. The probability of failure of the proposed new pressurized sour water spherical tank will be lower than for the existing atmospheric sour water tank. The probability of a release of hazardous substances from the proposed new vacuum distillation tower will be lower than the probability of release from the existing 50+-year old vacuum distillation tower. Finally, the probability of release of flammable gases or H_2S from the pressure relief valve system at either the No. 1 Crude Unit or Butane Tank Car Loading Rack will be reduced from current conditions since new pressure relief valve systems will capture vent gases that would otherwise be discharged to the atmosphere during pressure relief events. These gasses will be routed to a flare system. The April 2005 Addendum to the Final Environmental Impact Report for the BP Carson Refinery (formerly ARCO Los Angeles Refinery) CARB Phase 3/MTBE Phase-out Project concluded that incremental hazards impacts from the MTBE/Iso-octene conversion project at the BP Carson Refinery would not be significant. Therefore, the proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery would therefore not result in cumulatively considerable impacts to hazards and hazardous materials.

Hydrology and Water Quality

The proposed project would involve installing new and upgraded refinery equipment that is similar to existing refinery equipment. The proposed project is expected to have less-than-significant hydrology and water quality impacts. Incremental water use, wastewater flows, and runoff volumes will be small and will not adversely affect the availability of supply or the capacity of the applicable service systems. The proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery are not expected to adversely affect hydrology and water quality and would therefore not result in cumulatively considerable impacts to hydrology and water quality.

Land Use and Planning

Because the proposed project will only involve modifications within an existing industrial facility that is zoned and used for heavy manufacturing, the proposed project will represent no change in

land uses or zoning. The proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery will not result in adverse impacts related to land use and planning and would, therefore, not result in cumulatively considerable impacts to land use and planning.

Mineral Resources

Because the proposed project will only involve modifications within an existing industrial facility that contains no known mineral resources, the proposed project will not impact mineral resources. Therefore, the proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery will not result in cumulatively considerable impacts to mineral resources.

Noise

The proposed project is predicted to have less-than-significant noise impacts during construction, and will not create new/modified operational noise sources that would be audible over the existing noise at the refinery. Because the proposed project will not have project-specific noise impacts that exceed SCAQMD significance thresholds, the noise impacts from the proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery will not be cumulatively considerable.

Population and Housing

The proposed project will have no adverse impacts on population or housing during construction or operation. Because there will be no project-specific impacts, the proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery will not cause cumulatively considerable population and housing impacts.

Public Services

The proposed project will not have impacts on public services during construction or operation. Because the proposed project will not impact public resources, the proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery would not result in cumulatively considerable impacts to public services.

Recreation

The proposed project will not affect the demand for recreational facilities or adversely affect existing recreational facilities. Therefore, the proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery will not result in cumulatively considerable impacts to recreation.

Solid/Hazardous Waste

Solid and hazardous wastes that are expected to be generated during construction and operation of the proposed project are not expected to have significant adverse impacts on the capacity of

California waste disposal facilities. Because no significant project-specific impacts are expected, solid/hazardous waste impacts from the proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery are not expected to be cumulatively considerable.

Transportation/Traffic

The proposed project is not expected to have significant adverse impacts on transportation/traffic during the peak of construction, when the construction labor force reaches its maximum of 199 workers. No impacts are expected during operation because the proposed project will not change operational employment at the refinery. The construction of the proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery have a combined peak construction labor force of 129 workers in September 2005, as shown previously in **Table 1-4**. As presented in XVII.a) & b), the peak construction workforce for the proposed project of 199 workers, during August 2006, is not anticipated to cause significant adverse impacts to transportation/traffic. Because the combined peak construction labor force for the proposed project and the construction of the MTBE/Iso-octene conversion project of 129 workers is less than 199 workers, impacts to traffic/transportation during the overlap period for construction of the proposed project and MTBE/Iso-octene conversion project would be less than significant. Therefore, the proposed project will not result in cumulatively considerable impacts to transportation/traffic.

Because cumulative impacts from the proposed project and the ongoing construction of the MTBE/Iso-octene conversion project at the BP Carson Refinery do not exceed any project-specific significance thresholds as indicated in the preceding paragraphs, impacts from the combined projects are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15065. Therefore, neither the proposed project during peak construction periods nor construction during overlap of the two projects is expected to generate significant adverse cumulative environmental impacts.

XVIII.c) The proposed project is not expected to cause substantial adverse effects on human beings. Further, the proposed project was determined to have less than significant impacts for the topics of aesthetics, air quality, energy, geology/soils, hazards and hazardous materials, hydrology/water quality, solid/hazardous waste, and transportation/traffic due to construction and operational activities at the Carson Refinery. The most substantial impacts of the proposed project are beneficial reductions in emissions from replacing the primary sour water surge tank (Tank 710) and modifying the pressure relief valve systems for the No. 1 Crude Unit and Butane Tank Car Loading Rack. These projected reductions in emissions are expected to yield a reduction in odor complaints from the community near the refinery.

Also, the proposed construction of a new vacuum distillation tower to replace the existing 50+ year old vacuum distillation tower will improve safety conditions, as well as improve reliability and efficiency of the No. 51 VDU.

No impacts are expected to occur for the environmental topics of agriculture resources, biological resources, cultural resources, land use/planning, mineral resources, noise, population and housing, public services, and recreation as a result of the implementation of the proposed project.

As discussed in items I through XVIII, the proposed project has no potential to cause significant adverse environmental effects.

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APPENDIX A

EMISSIONS AND HEALTH RISK ASSESSMENT SCREENING CALCULATIONS

APPENDIX B

TRAFFIC IMPACT ANALYSIS
(Prepared by Austin-Foust Associates, Inc.)

APPENDIX C

HAZARDS CONSEQUENCE ANALYSIS