1.1 REGULATORY BACKGROUND

California gasoline specifications are governed by both state and federal agencies. During the past decade, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. In December 1999, the California Air Resources Board (CARB) developed additional regulations with future compliance dates that effect the quality of gasoline in California. In order to meet these additional regulations, Equilon Enterprises LLC (Equilon) will require modifications to its Los Angeles Refinery (Refinery).

In 1990, the amendments to the federal Clean Air Act (CAA) conditionally required States to implement programs in federal carbon monoxide (CO) non-attainment areas to require gasoline to contain a minimum oxygen content in the winter beginning in November 1992. In response to the federal CAA requirements to reduce CO emissions, California established a wintertime oxygenate gasoline program requiring between 1.8 and 2.2 weight percent oxygen content in gasoline.

In addition, the CAA directed the U.S. Environmental Protection Agency (U.S. EPA) to adopt federal reformulated fuel gasoline (RFG Phase 1) regulations applicable starting January 1995 in the nine major metropolitan areas of the country, including the South Coast Air Basin, with the worst ozone pollution. The federal CAA required that RFG Phase 1 contain at least 2.0 weight percent oxygen year-round. In addition to the federal RFG Phase 1 requirements, California adopted regulations for reformulated gasoline in 1991 (RFG Phase 2). Because of the federal requirements for oxygen content in RFG Phase 1, an oxygen content specification was incorporated in the RFG Phase 2 California reformulated gasoline regulations. The RFG Phase 2 requirements were implemented in March 1996. A summary of the air quality benefits from the RFG Phase 2 requirements is shown in Table 1-1. The RFG Phase 2 specifications are shown in Table 1-2 below.

TABLE 1-1

EMISSION BENEFITS ASSOCIATED WITH RFG PHASE 2 REGULATIONS*

POLLUTANT	Reduction	
	Tons per Day	Percent
Hydrocarbons	190	17
Nitrogen oxides	110	11
Carbon Monoxide	1,300	11
Sulfur oxides	30	80
Potency-weighted sum of toxic species	--	40

*Source: CARB, 1999.

Neither RFG Phase 1 or 2 regulations specified the type of oxygenate required. While there are several oxygenates that can be used to meet the oxygenate requirement for gasoline, methyl

tertiary butyl ether (MTBE) and ethanol are used most frequently. In 1996, over 95 percent of the gasoline used in California was blended with MTBE (CARB, 1999).

In California and other parts of the U.S., the use of MTBE and other ether-based oxygenates in gasoline raised environmental and health concerns. Recent legislation in California (SB 521, The MTBE Public Health and Environmental Protection Act of 1997) directed the University of California to conduct a study of the health and environmental risks and benefits of MTBE in gasoline compared to other oxygenates. SB 521 also required the Governor to take appropriate action based on the findings of the report and information from public hearings.

In consideration of this study, public testimony, and other relevant information, California's Governor Davis found that, "on balance, there is significant risk to the environment from using MTBE in gasoline in California." In response to this finding, on March 25, 1999, the Governor issued Executive Order D-5-99 which directed, among other things, that California phase out the use of MTBE in gasoline by December 31, 2002. As part of the Executive Order, on December 9, 1999, CARB adopted new gasoline specifications, which are known as California Reformulated Gasoline Phase 3 (RFG Phase 3) requirements. A summary of RFG Phase 3 requirements is shown in Table 1-2.

TABLE 1-2

REFORMULATED GASOLINE PHASE 2 AND 3 REQUIREMENTS*

PROPERTY	RFG Phase 2 Requirements	RFP Phase 3 Requirements
RVP (psi) max.	7.0	6.9**
Benzene (vol. %), max.	1.00	0.80
Sulfur (ppmw), max.	40	20
Aromatic Hydrocarbons (vol. %), max.	25	25
Olefins (vol. %), max.	6.0	6.0
Oxygen (wt. %)	1.8 to 2.2	1.8 to 2.2
T50 °F, max.***	210	213
T90 °F, max.***	300	305

Source: CARB, 1999.

* Based on the flat limit standard for producers, there are "average" and "cap" limits for all gasoline sold throughout the distribution system.

** The listed RVP limit applies when the Evaporative Model is activated within the Predictive Model. If the Evaporative Model is not activated the flat limit for RVP is 7 psi.

*** T50 and T90 are the temperatures at which 50 and 90 percent, respectively, are distilled.

The RFG Phase 3 requirements prohibit the use of MTBE, while establishing more stringent standards for sulfur and benzene and relaxing two standards for distillation temperatures (T50 and T90). In addition, the RFG Phase 3 requirements provide flexibility in meeting the Reid vapor pressure (RVP) standard. In order to phase out the use of MTBE and comply with RFG Phase 3 requirements, Equilon is proposing modifications to its existing Los Angeles Refinery and related distribution terminals.

1.2 LEAD AGENCY

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. To fulfill the purpose and intent of CEQA, the South Coast Air Quality Management District (SCAQMD) is the lead agency for this project and has prepared this Initial Study and Notice of Preparation (NOP) to address the potential environmental impacts associated with the Equilon RFG Phase 3 proposed project.

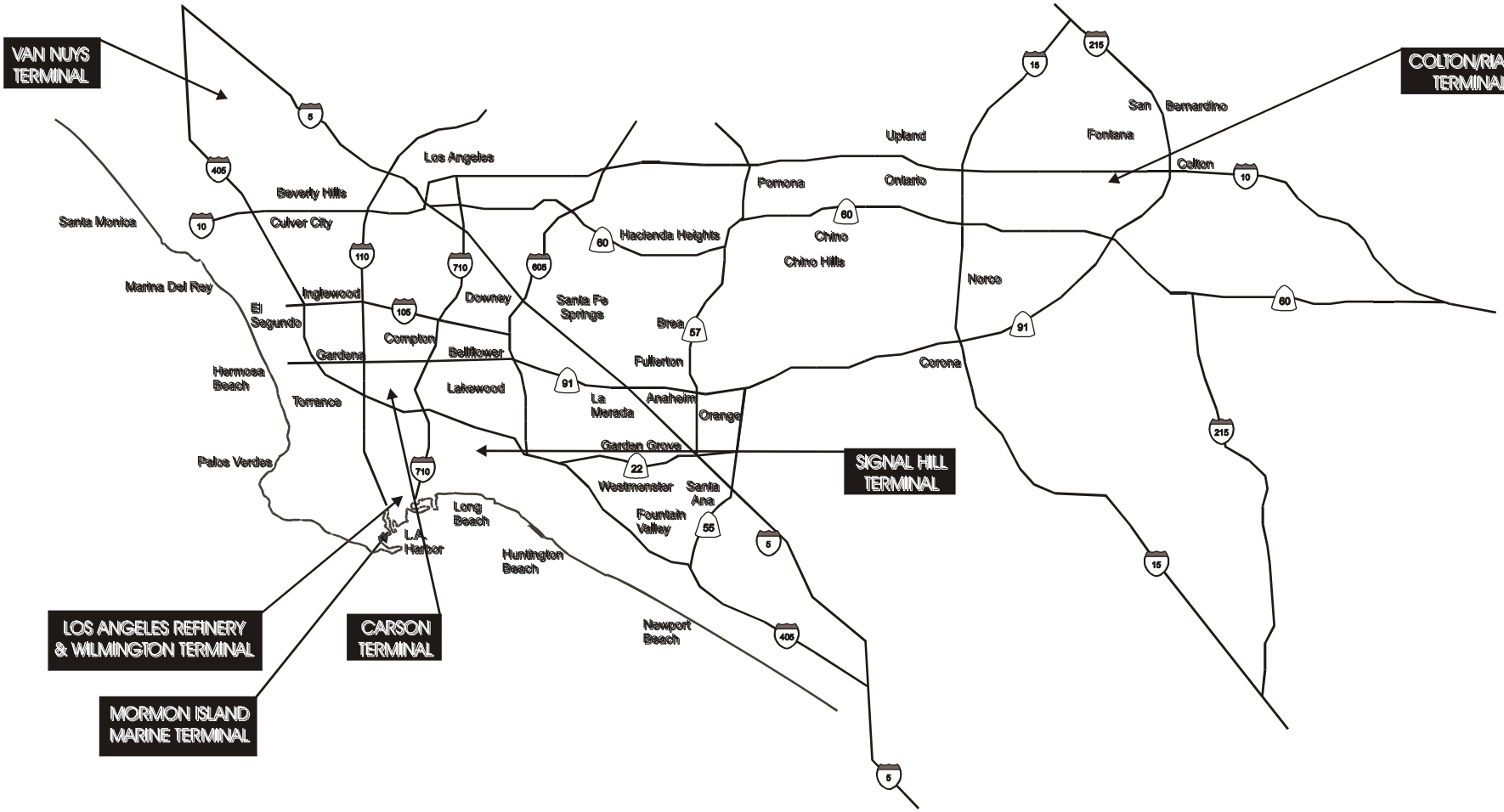
The lead agency is the public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment (Public Resources Code Section 21067). It was determined that the SCAQMD has the primary responsibility for supervising or approving the entire project as a whole and is the most appropriate public agency to act as lead agency (CEQA Guidelines Section 15051(b)). The proposed project requires discretionary approval from the SCAQMD for modifications to existing stationary source equipment and installation of new stationary source equipment.

1.3 PROJECT LOCATION

The proposed project will be constructed at the Refinery which is located at 2100 E. Pacific Coast Highway in the Wilmington district of the City of Los Angeles. The Wilmington Temrinal is located adjacent to the southwestern portion of the Refinery at 1926 E. Pacific Coast Highway. Figure 1-1 shows the vicinity and the project site location. The Refinery occupies about 300 acres of land; the larger portion of which is located within the jurisdiction of the City of Los Angeles, and the smaller portion of which is located within the City of Carson. The Refinery is bounded to the north by Sepulveda Boulevard, to the west by Alameda Street, to the south by the Southern Pacific Railroad tracks, and to the east by the Dominguez Channel. The Refinery is bisected by Pacific Coast Highway, with the larger portion of the Refinery to the north of Pacific Coast Highway and the smaller portion to the south. The Refinery and all adjacent areas are zoned for heavy industrial use. The closest residential area is about one-half mile east of the Refinery in the City of Long Beach.

The proposed project also will require changes to distribution terminals in the Southern California area. The Signal Hill Terminal is located at 2457 Redondo Avenue in Signal Hill. The site is located just south of the 405 Freeway and south of Willow Street and is surrounded by industrial and commercial land uses. Residential land uses are located about one-quarter mile south of the terminal.

The Carson Terminal is located at 20945 S. Wilmington Avenue, Carson (the former location of the Shell Oil Refinery). The facility is located in an industrial area and surrounded primarily by industrial and commercial land uses on the east, west, and north. Residential land uses are located adjacent to and south of the terminal.



Environmental Audit, Inc.

EQUILON PROPOSED PROJECT
LOCATION MAP

Figure 1-1

Project No. 1994
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The Van Nuys Terminals is located at 8100 Haskell Avenue in Van Nuys. The terminal is located west of the 405 Freeway and east of the Van Nuys Airport in an industrial area. The terminal is surrounded by industrial land uses including a brewery, another tank farm, and aerospace industries. Residential land uses are located north of Roscoe Boulevard and east of the San Diego Freeway.

The Colton and Rialto Terminals are located adjacent to each other at 2307 and 2237 in the community of Bloomington within the cities of Rialto and Colton in a predominately industrial area. Other storage tanks farms and terminals are located south of the Colton/Rialto Terminals. A Union Pacific railroad yard is located northwest of the site. Other industrial uses are located east and west of the site. A residential area is located north of the terminals, north of Solver Avenue.

The marine terminal is located on Mormon Island at Berths 167-169 within the Port of Los Angeles. The marine terminal is located in an industrial area surrounded by other terminals and industrial, port-related uses.

1.4 LAND USE AND ZONING

Th Refinery and Wilmington Terminal are zoned for heavy industrial uses (M3-1). The land use in the vicinity of the Refinery and terminal includes oil production and refineries, hydrogen plants, coke handling facilities, automobile wrecking/dismantling facilities, and other industrial facilities.

The main operating portions of the Refinery and terminal are located within the Wilmington-Harbor City Planning Area (City of Los Angeles), which permits heavy industrial uses including petroleum refining on the Equilon property (City of Los Angeles, 1999). A conditional use permit is thus not required for this proposed project. The Wilmington-Harbor City Plan places no additional restrictions on refineries, and specifically allows for construction without regard to height limitations.

A portion of the Refinery's tank farm and its Sulfur Recovery Plant are located within the City of Carson. This portion of the Refinery is located in the City of Carson's MH zone according to the City of Carson's Land Use element of its General Plan. Adjacent land uses also are heavy industrial and include other refineries, a hydrogen plant, undeveloped lots and container storage areas.

The Equilon terminals are located in industrial areas of the cities of Signal Hill, Carson, Van Nuys, Colton, Rialto, and Los Angeles.

1.5 EXISTING REFINERY CONFIGURATION AND OPERATION

Crude oils, used to produce gasoline and other petroleum products, are delivered to marine terminals in the Ports of Los Angeles and Long Beach by ship. Crude oil also is delivered to the Refinery by pipelines. Crude oil is processed in the crude unit and the delayed coking unit where it

is heated and distilled into components, most of which are processed in downstream Refinery units. Most of the products leaving the crude unit and delayed coking units are hydrotreated to remove sulfur compounds prior to further processing in the fluid catalytic cracking unit, the hydrocracking unit, the alkylation unit, and the catalytic reforming units. The crude oil, along with the intermediate products, are refined into the major Refinery products which include unleaded gasoline, diesel, aviation jet fuel, other distillate fuels, petroleum coke, and sulfur. Elemental sulfur and petroleum coke are produced as a by-product of the refining process. Major processing units at the Refinery include the crude, delayed coking, catalytic reforming, hydrotreating, fluid catalytic cracking, alkylation, benzene saturation, hydrogen generation, sulfur recovery, cogeneration, and auxiliary systems. Figure 1-2 provides the existing Refinery flow diagram.

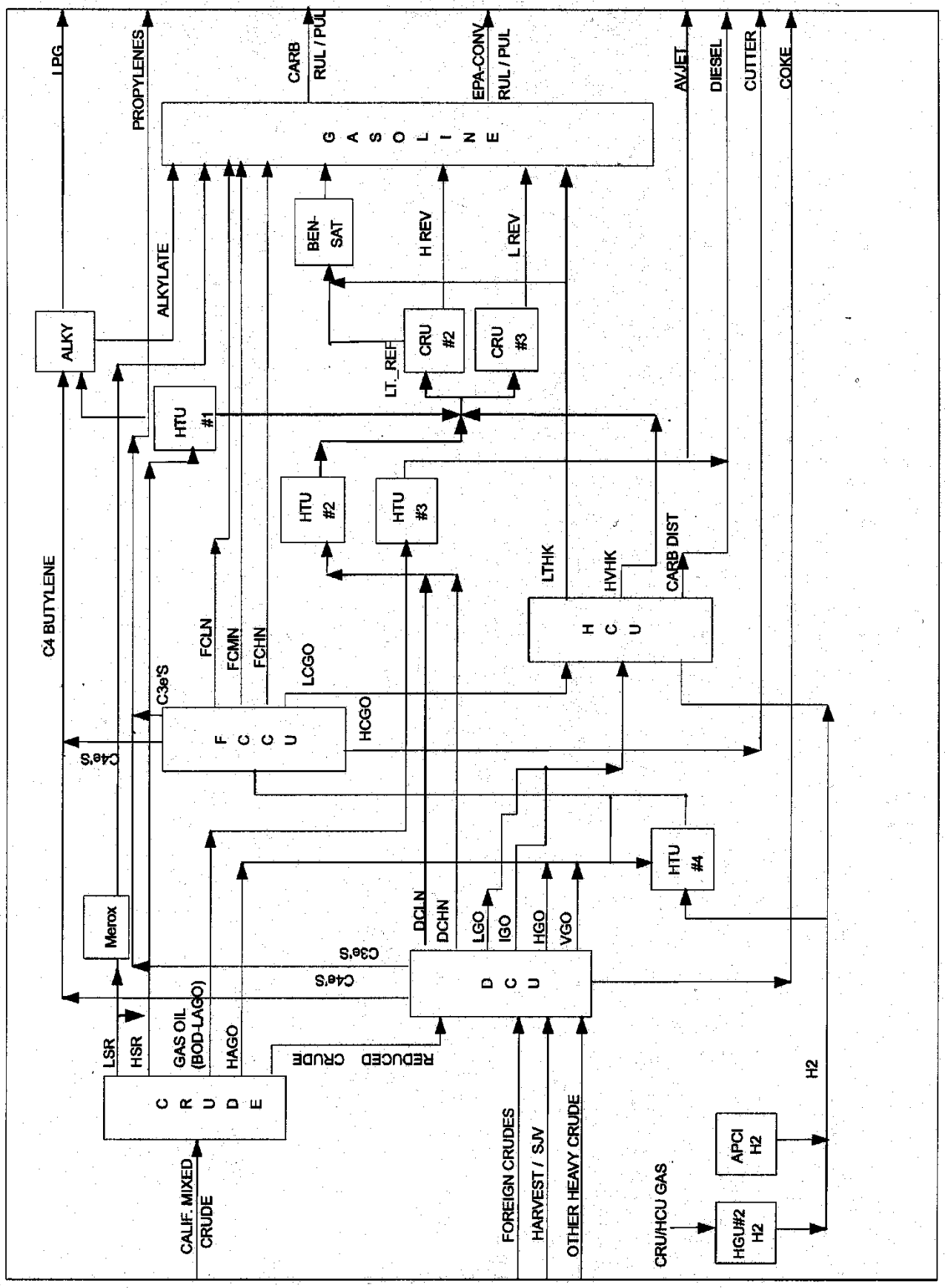
1.6 PROPOSED PROJECT MODIFICATIONS

In order to produce gasoline that complies with RFG Phase 3 requirements, Equilon is proposing to make a number of changes to the configuration of the Refinery by modifying existing process operating units, constructing and installing new units, modifying storage tanks, providing additional ancillary facilities, and modifying the Refinery utility systems (steam, air, power, water, fuel gas, etc.) as required to support the new and modified units. In addition, modifications to Equilon terminals also are proposed to handle ethanol. The modifications proposed by Equilon to comply with the Phase 3 Reformulated Fuels requirements are outlined below. Figure 1-3 shows the revised Refinery flow diagram following completion of the proposed project. The proposed project is not expected to increase the crude throughput at the Refinery. Table 1-3 summarizes the proposed project modifications.

1.6.1. Modifications to Existing Units

Hydrotreater Unit No. 2 (HTU-2): As part of the RFG Phase 3 project, HTU-2 will be modified. Modifications will include the installation of a new olefins saturation reactor in series with a new pretreat reactor, new charge pumps, new heat exchangers, replacement of the active tray area, replacement of the stripper reboiler, new control valves, and piping modifications. Modifications also will be required to the HTU-2 charge heater, which will be retubed. The modification will increase the capacity of HTU-2 from 13,000 barrels per day (bpd) to 20,000 bpd.

C4 Isomerization Unit: Equilon is proposing to convert an existing idle reformer unit into a C4 Isomerization Unit in order to provide additional isobutane for feed to the Alkylation Unit. The feed capacity of the C4 Isomerization Unit is expected to be 7,500 bpd. This unit supports the expansion of the Alkylation Unit as described below and eliminates existing truck traffic across Equilon's LPG loading rack that currently supports the export of normal butane and import of isobutane for the Alkylation process. The C4 Isomerization Unit will use existing equipment including vessels, reactors, exhangers, and pumps. Equilon also is proposing to use an existing zinc oxide treater in the BenSat Unit in the C4 Isomerization Unit. New equipment in the unit will include some additional exchangers, a stabilizer, a new gas scrubber, driers, vessels, pumps, and piping.

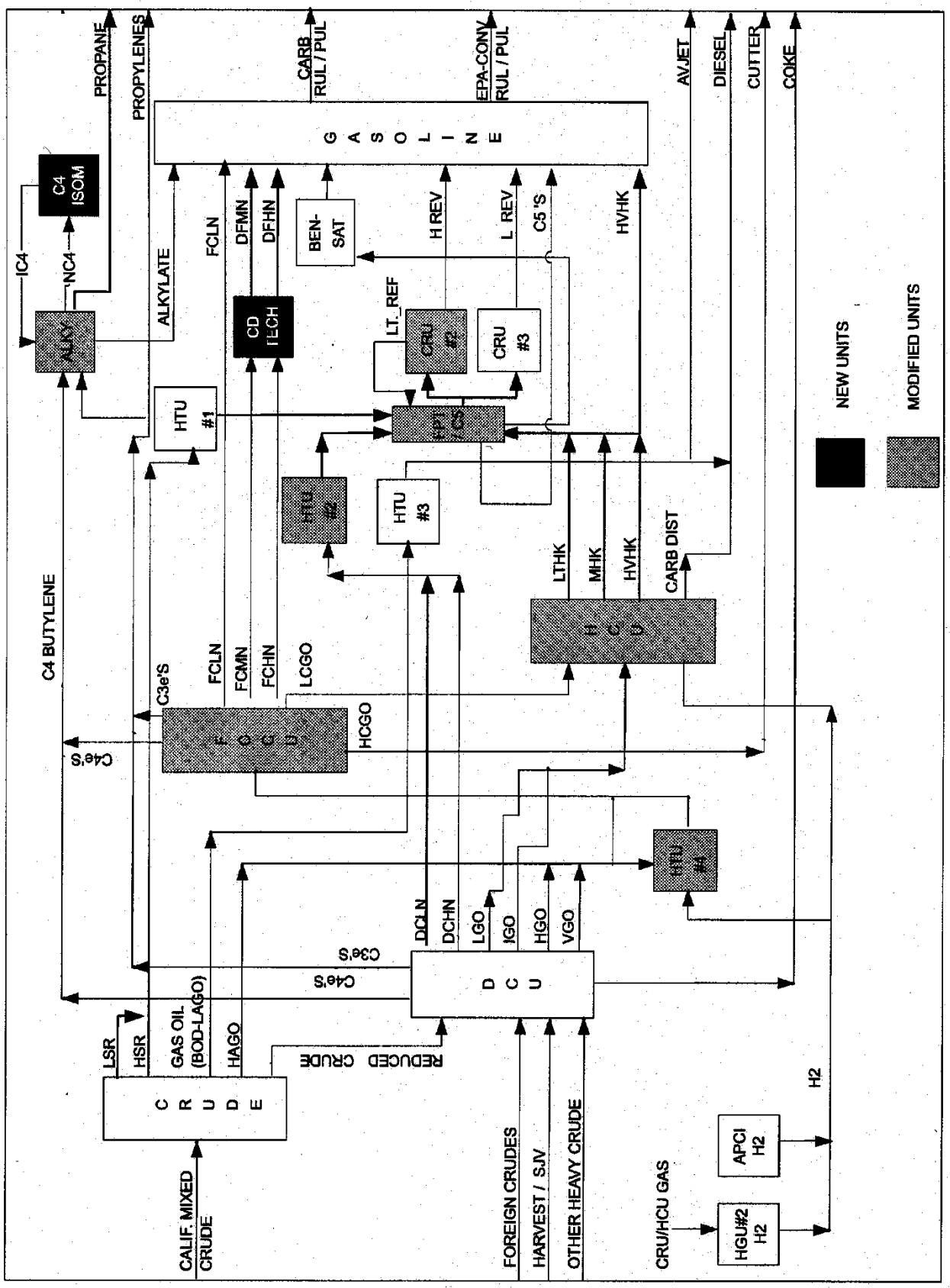


EQUILON EXISTING REFINERY FLOW DIAGRAM

FIGURE 1-2

PROJECT NO. 1994

N:/1994/1994FIG2



PROJECT NO. 1994 **FIGURE 1-3**

N:/1994/1994FIG3

TABLE 1-3

PROPOSED PROJECT MODIFICATIONS

Process Change/Equipment Description	Nature of Change
RVP Control	
Alkylation Unit –	
Contactor and Settler	New
Refrigeration Unit	New
Cooling Tower	Modifications
Exchangers/Pumps	New
C4 Isomerization Unit –	
Vessels	New/Modifications
Reactors	Modifications
Exchangers	New/Modifications
Pumps/Piping	New/Modifications
Zinc Oxide Treater	Modifications
Stabilizer	New
Gas Scrubber	New
Drier	New
Fractionator Changes	
HCU Main Fractionator	Modifications
FCCU Debutanizer	Modifications
Feed Prep Tower	Modifications
Depentanizer	Modifications
Alky Deisobutanizer	Modifications
Alky Debutanizer	Modifications
C4 Isomerization Deisobutanizer	Modifications
Pentane Sphere	New
Reduce Sulfur Content of Gasoline	
Alkylation Unit –	
Effluent Treating Vessels	New/Modifications
Hydrotreater Unit No. 2 –	
Olefins Saturation Reactor	New
Pretreat Reactor	New
Charge Pumps	New
Heat Exchangers	New
Trays	Replacement
Stripper Reboiler	Replacement
Control Valves	New
Piping	Modifications
Hydrotreater Unit No. 4 –	
Main Reactor	Modifications
Diesel Side Stripper	New
Feed Steam Preheater	New
Heat Exchangers	New
Piping	Modifications

TABLE 1-3 (cont.)

Process Change/Equipment Description	Nature of Change
Reduce Sulfur Content of Gasoline (Cont.)	
CDS Tech Unit	
Columns	New
Reactors	New
Stabilizer	New
Absorbers	New
Condensers	New
Exchangers	New
Coolers	New
Pumps	New
Compressors	New
Drums	New
Heater	New
Merichem – Tiolex Unit	
Casutic Extraction Process	Modifications
Caustic Regeneration Unit	Modifications
Mercaptan Oxidation System	New
Oxidation Vessel	New
Contactors	Modifications
Heat Exchangers	New/Mods
Strainers	New/Mods
Piping	New/Mods
Pumps	New/Mods
Valves/Flanges/Fittings	New/Mods
Octane Optimization	
Alkylation Unit –	
Contactor and Settler	New
Refrigeration Unit	New
Cooling Tower	Modifications
Exchangers/Pumps	New
C4 Isomerization Unit –	
Vessels	New/Modifications
Reactors	Modifications
Exchangers	New/Modifications
Pumps/Piping	New/Modifications
Zinc Oxide Treater	Modifications
Stabilizer	New
Gas Scrubber	New
Drier	New

TABLE 1-3 (cont.)

Process Change/Equipment Description	Nature of Change
Octane Optimization (Cont.)	
Fractionator Changes	
HCU Main Fractionator	Modifications
FCCU Debutanizer	Modifications
Feed Prep Tower	Modifications
Depentanizer	Modifications
Alky Deisobutanizer	Modifications
Alky Debutanizer	Modifications
C4 Isomerization Deisobutanizer	Modifications
HCU Depropanizer	Modifications
Catalytic Reforming Unit No. 2	
Sulfur Guard Reactor	New
Debutanizer Tower	Modifications
CDS Tech Unit	
Columns	New
Reactors	New
Stabilizer	New
Absorbers	New
Condensers	New
Exchangers	New
Coolers	New
Pumps	New
Compressors	New
Drums	New
Heater	New
Utilities	
Flare	Modifications
Vapor Recovery Systems	Modifications
Elimination of MTBE	
Storage Tank – Refinery	Modifications
Storage Tanks – Carson Terminal	New
Piping, Valves, Flanges, and Loading Racks – Carson Terminal	Modifications
Storage Tanks – Signal Hill Terminal	New
Piping, Valves, Flanges, and Loading Racks – Signal Hill Terminal	Modifications
Storage Tanks – Colton/Rialto Terminal	New
Piping, Valves, Flanges, and Loading Racks – Colton/Rialto Terminal	Modifications
Storage Tank – Van Nuys Terminal	New
Piping, Valves, Flanges, and Loading Racks – Van Nuys Terminal	Modifications
Marine Terminal, Wilmington Terminal	Modifications

Catalytic Reforming Unit (CRU2): Modifications to CRU2 are being proposed to process the feeds from the Feed Prep Tower and the Hydrocracker Unit (HCU) fractionator. These changes include a new reactor that uses a nickel oxide catalyst to remove additional quantities of sulfur from CRU2 feed and a retray of the Debutanizer tower.

Alkylation Unit: Alkylate provides a high quality clean burning gasoline blendstock that contains little to no sulfur, aromatics, or olefins. Equilon is proposing to expand the Alkylation Unit from 8,500 bpd to 12,000 bpd. The major components of this expansion include addition of alkylate effluent treating vessels, a new contactor and settler, a refrigeration unit, modifications to an existing cooling tower, new exchangers, and pumps. These Alkylation unit modifications also require the availability of higher pressure steam (600 pounds per square inch) which would require a new boiler or suitable alternative to this steam.

Hydrotreating Unit No. 4 (HTU4): Equilon in proposing to modify HTU4 to remove additional quantities of sulfur from hydrocarbon streams. Modifications include changes to the main reactor, addition of a diesel side stripper, addition of a new feed steam preheater, additional heat exchangers and piping modifications.

Fractionator Changes: Equilon is proposing changes in a number of fractionator columns as part of the proposed project in order to provide Reid vapor pressure (RVP) control, increase high octane reformate production, and produce additional alkylate. These changes are required to replace octane loss from the elimination of MTBE and for RVP control when ethanol is used as a replacement for MTBE. Hardware revisions are required to the HCU Main Fractionator, Fluid Catalytic Cracking Unit (FCCU) Debutanizer, Feed Prep Tower, Depentanizer, Alky Deisobutanizer, Alky Debutanizer, and the C4 Isomerization Deisobutanizer (an existing column to be revamped to support the new C4 Isomerization Unit). Changes to the columns generally involve tray modifications and revisions to the stream cutpoints. In addition, operational revisions will be required to the HCU Depropanizer and the CRU2 Splitter.

1.6.2. New Units

CD Tech Unit (CD HDS): The CD Tech HDS Unit will provide additional desulfurization capabilities at the Refinery and assist in compliance with the lower sulfur limits in gasoline. The new unit will include new columns, reactors, stabilizer, absorbers, condensers, exchangers, coolers, pumps, compressors, fired heater, and drums. The unit will use a desulfurizing catalyst to remove sulfur from certain Refinery streams. The CD Tech Unit will be designed with a capacity of about 16,000 bpd.

Merichem-Thioloex Unit: Equilon may revamp an existing idle 11,000 bpd Merichem Unit into an extractive Thioloex Unit that will remove sulfur from light naphtha in order to meet future gasoline total sulfur specifications. The Thioloex Unit extracts mercaptans using a caustic (sodium hydroxide) extraction process. The Unit will also include a caustic regeneration system and a mercaptan oxidation system. New equipment will include an oxidation vessel, contactors, exchangers, strainers, piping, pumps, valves, flanges, and fittings.

Pentane Sphere: A new 60,000 barrel pentane (C5) sphere is proposed to be installed in the north area of the Refinery. Pentane blending and loading pumps, in addition to new piping, valves and fittings, will be required as part of the new sphere.

1.6.3. Auxiliary Systems

Storage Tank Modifications: The service on several storage tanks will be modified. MTBE currently is stored in a tank at the Refinery. MTBE will no longer be blended into gasoline or delivered to the Refinery, therefore, all tanks currently in MTBE service will be changed and the throughput of the tanks also is expected to change. The throughput on some tanks in petroleum service is also expected to change.

Flare and Vapor Recovery Systems: Modifications to the Refinery's existing flare and vapor recovery systems will be required as part of the project to incorporate the proposed modifications and new units.

1.6.4 Terminal Modifications

The proposed project includes the removal of MTBE an an oxygenate in gasoline produced by the Refinery. Instead, Equilon will use ethanol as an oxygenate. Because ethanol absorbs water easily, it must be blended into gasoline at the Terminals to minimize the potential for contamination with water in the distribution system.

Equilon plans to receive ethanol at its Carson Terminal and store it in four existing above-ground storage tanks. The ethanol will be received at the Carson Terminal primarily by rail car and off-loaded through a new rail car off-loading rack into the storage tanks. In addition, some ethanol will be received at the Equilon Mormon Island Marine Terminal and transferred via an existing pipeline to the storage tanks at the Carson Terminal (see Figure 1-1). Shipments of MTBE to the marine terminal are expected to be eliminated following completion of the proposed project.

A new truck loading rack and vapor processor will be installed at the Carson Terminal. Trucks will be loaded with ethanol at the rack and transport ethanol to terminals located in Colton, Rialto, Signal Hill, Van Nuys and Wilmington (see Figure 1-1). New equipment to be installed at these five terminals includes an ethanol storage tank, ethanol off-loading pad and miscellaneous piping.

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