3 Project Description

This chapter presents a description of the proposed Project, including background and location, objectives, key features and components, construction and operational activities, and permits and approvals that are required to implement the Project. It also presents a description of the existing operations and processes at the Rodeo Refinery and summarizes the process changes that would be included in the Project.

3.1 Project Background

Refineries operating in California are subject to state, local, and federal air pollution control regulations and emission reduction programs designed to reduce GHG emissions. Under California Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, refineries are subject to regulations aimed at reducing California’s global warming emissions and transitioning to a sustainable, low-carbon future (CARB 2021). The latest Update to the Climate Change Scoping Plan (CARB 2017) sets goals of a 40 percent GHG emission reduction below 1990 emission levels by 2030 and a substantial advancement toward the 2050 goal to reduce emissions by 80 percent below 1990 emission levels. To meet these goals, AB 32 directed the California Air Resources Board (CARB) to adopt measures aimed at achieving emissions reductions through regulations, monetary and non-monetary incentives, market-based mechanisms, and other actions. Key AB 32 regulations that affect refineries include the following (CARB 2021):

- Low-Carbon Fuel Standard (LCFS), which is intended to decrease the carbon intensity (CI) of California’s transportation fuel pool and provide an increasing range of low-carbon and renewable alternatives, reducing petroleum dependency;
- Cap-and-Trade Regulation, which establishes a declining limit on major sources of GHG emissions throughout California with economic incentives to invest in cleaner, more efficient technologies;
- Mandatory Reporting of GHG Emissions Regulation, which requires fuel suppliers, among other major sources of emissions, to provide a summary of reported GHG emissions data; and
- Energy Efficiency and Co-Benefits Assessment of Large Industrial Facilities, which requires an energy efficiency assessment of California’s large industrial facilities to determine the potential for GHG emission reductions and other pollution reduction co-benefits.

3.2 Project Location and Access

As shown in Figure 3-1, the Rodeo Refinery is bordered by San Pablo Bay on the north and west, open land to the east and southeast, the NuStar Energy tank farm on the northeast, the Bayo Vista residential area of Rodeo to the southwest, and the residential enclave of Tormey, located east and adjacent to the NuStar Energy tank farm. Originally constructed in 1896, at which time the land was essentially vacant and agricultural, the Rodeo Refinery occupied 22 acres. During the second half of the twentieth century, it was expanded considerably as capacity and new processes were added and as vacant buffer zone land was acquired.

The Rodeo Refinery comprises approximately 1,100 acres of land, but the Rodeo Site, where the main components of the Project would take place, is the 495-acre developed portion of the property northwest of Interstate 80 (I-80). The Rodeo Site is currently covered by a mixture of impervious surfaces associated with process equipment, parking areas, roads, and other pervious surfaces. The remaining portion of the Rodeo Refinery, southeast of I-80, consists of a tank farm, the Carbon Plant Site, and undeveloped land that serves as a buffer zone.
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Legend

- Project Boundary
- Interstate
- Major Roads

Figure 3-1: Rodeo Refinery and Vicinity
Rodeo Renewed Project
Contra Costa County, CA
Primary access to the Rodeo Refinery, used by refinery support trucks and workers, is provided by Cummings Skyway between I-80 and the Rodeo Site’s north gate; secondary access is from San Pablo Avenue, which runs parallel to and a short distance inland from the waterfront and from which several roads and entry gates lead into various areas of the Rodeo Site. San Pablo Avenue is a four-lane arterial that connects numerous East Bay communities between Oakland, approximately 18 miles south of Rodeo, and the Carquinez Bridge in Crockett, approximately 2 miles northeast of Rodeo.

3.2.1 General Plan and Zoning
The Rodeo Refinery is located in an unincorporated area of Contra Costa County that is designated Heavy Industry in the Land Use Element of the Contra Costa County General Plan (Contra Costa County 2010) and is zoned for heavy industrial use in the Contra Costa County Zoning Ordinance.6

3.3 Surrounding Area Characteristics
The areas adjacent to the Rodeo Refinery are characterized by a mix of land uses including undeveloped land and industrial, commercial, office, and residential uses (Figure 3-1). Directly abutting the Rodeo Site on the north is San Pablo Bay and the Union Pacific/Amtrak railroad right-of-way. Abutting the eastern boundary is the NuStar Energy tank farm, and beyond that a small residential enclave of Tormey along Old County Road and undeveloped, hilly open space. I-80 runs through the Rodeo Refinery roughly from southwest to northeast and divides the refinery portion of the property (i.e., the Rodeo Site) from the undeveloped portion of the property, part of the tank farm, and the Carbon Plant Site. San Pablo Avenue runs through the Rodeo Site in roughly the same direction as I-80 but is approximately 0.75 mile to the northwest.

To the south and west of the Rodeo Refinery, beyond a buffer zone of vacant land, is the Community of Rodeo. The enclave of Tormey and the Bayo Vista residential neighborhood of Rodeo, with several schools, at least one daycare center, several churches, and a few commercial establishments, are the closest residential area to the Rodeo Refinery. Because of the buffer zone, no residential or commercial uses directly abut the Rodeo Site or the Rodeo Refinery as a whole. An apartment complex is located at the eastern edge of Bayo Vista. This complex comprises approximately 60 multi-unit buildings, the closest of which is approximately 400 feet from the Rodeo Site’s border and is separated by the buffer zone space. All other residential uses are at least 0.25 mile (1,300 feet) from the Rodeo Refinery. No schools are within 0.5 mile (2,600 feet) of the Rodeo Refinery. The two closest schools are a Montessori academy on Parker Avenue (approximately 0.63 mile from the Rodeo Site) and the Rodeo Hills Elementary School on Rodeo Avenue (approximately 0.8 mile from the Rodeo Site). Most commercial uses in the vicinity are located in an area centered on San Pablo Avenue/Parker Avenue, approximately 0.5 mile southwest of the Rodeo Site.

3.3.1 Environmental Justice Communities
The analysis of environmental justice refers to the assessment of environmental impacts, primarily from the perspective of federal law, focused on the potential for projects to create adverse impacts that might be disproportionately borne by under-served or disadvantaged (minority and low-impact) communities.

The Office of Environmental Health Hazard Assessment’s community health risk screening methodology, CalEnviroScreen, indicates that the Project is located within and adjacent to census tracts that have an overall population vulnerability to pollution ranking in the 80th to 90th percentile; this means that those tracts are in the upper 20 percent of overall impacted areas in the state of California (OEHHA 2021). The community of Rodeo is an Impacted Community that experiences exposure to TACs, including diesel

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6 Assessor Parcel Numbers for the Rodeo Refinery are 357-010-001, 357-300-005, 357-320-002, 357-010-002, 357-210-009, 357-210-010, 357-300-300-001, 357-300-008, 357-310-001, 358-010-008, 358-020-004, and 358-030-034.
particulate matter, with sensitive populations affected by pulmonary and cardiovascular conditions. This high vulnerability ranking indicates a need to reduce overall emissions and exposures.

Contra Costa County will be developing a plan-level approach to reduce emissions and improve community health in the Project area. Concurrent with the Project and with assistance from the Bay Area Air Quality Management, Contra Costa County plans to develop a community risk-reduction plan as part of the Stronger Communities Element of the Envision Contra Costa 2040 General Plan (Contra Costa County 2021). For analysis of potential environmental justice impacts of the Project, refer to Section 4.17, Environmental Justice.

3.4 Project Sites

3.4.1 Terminology

The Project consists of activities at several sites owned and operated by Phillips 66 located throughout the state. These sites include the Rodeo Site (Figure 3-2), Carbon Plant Site in nearby Franklin Canyon (Figure 3-3), Santa Maria Site in San Luis Obispo County (Figure 3-4), and Pipeline Sites locations (Figure 3-5). The following terminology is used in this document:

- **Rodeo Refinery** is used to describe the approximately 1,100 acres composing the current Rodeo Refinery, including the Carbon Plant, located approximately 1.5 miles east of the Rodeo Site;
- **Rodeo Site** refers to the 495 developed acres within the Rodeo Refinery where the main Project activities would occur;
- **Carbon Plant Site** refers to the current location of the Carbon Plant in Franklin Canyon (within the 1,100-acre Rodeo Refinery);
- **Santa Maria Site** refers to the Santa Maria Refinery, including the applicant-owned buffer land, located near Nipomo, San Luis Obispo County; and
- **Pipeline Sites** refers to the four pipelines (i.e., Lines 100, 200, 300, and 400) that transport crude oil and/or pressure petroleum distillate from the Santa Maria Site to the Rodeo Refinery.

3.4.2 Existing Rodeo Refinery

The Rodeo Refinery consists of process, storage, and support facilities (Figure 3-2) that produce a variety of petroleum-based products (mainly fuels) and byproducts from crude oil and other petroleum-based feedstocks (such as pressure distillate and gas oils). Under existing conditions, crude oil is brought into the Rodeo Refinery via pipeline from elsewhere in California and via tanker and barge vessels from domestic and foreign sources. Other feedstocks required in the refining process are transported by pipeline from the Santa Maria Site, by tanker vessel, and by truck (small quantities of transmix), while other feedstocks, such as hydrogen, are produced on the Rodeo Site or nearby. Crude oil and feedstocks are stored at tank farms within the Rodeo Refinery until needed for the refining process.

The Rodeo Refinery has the capacity to produce approximately 120,000 barrels of petroleum-based products per day (5.04 million gallons per day [mgd]) via the processes shown in Figure 3-6.
Figure 3-3: Carbon Plant Site

Rodeo Renewed Project
Contra Costa County, CA

Legend

- Carbon Site Features

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Legend

- Red: Refinery Boundary
- Black: Property Boundary

Figure 3-4: Santa Maria Site
Rodeo Renewed Project
Contra Costa County, CA

Imagery Source: Maxar
11/1/2019

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Figure 3-5: Pipeline Sites
Rodeo Renewed Project
Contra Costa County, CA

File Path: R:\Cardno\Rodeo\map\Rodeo_Fig3-5_Pipeline_Site.mxd
Date Revised: 7/19/2021
GIS Analyst: anna.clare
Rodeo Refinery
Pre-Project
Block Flow diagram

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Figure 3-6: Existing Refinery Process Flow
Rodeo Renewed Project
Contra Costa County, CA

Date Created: 7/19/2021  Date Revised: 7/19/2021  File Path: R:\Cardno\Rodeo\map\Rodeo_Fig3-6_ExistingRefinery_ProcessFlow.mxd
GIS Analyst: anna.clare
3.4.2.1 Existing Rodeo Refinery Process Units

Major equipment used at the Rodeo Refinery for manufacturing fuels include distillation columns, storage tanks, reactors, vessels, heaters, boilers, and other ancillary equipment. Table 3-1 provides a brief description of the major process units. Figure 3-6 presents a schematic diagram of the existing process flows. Existing processes are summarized in the following sections.

Table 3-1. Existing Major Process Units

<table>
<thead>
<tr>
<th>Unit</th>
<th>Basic Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Distillation Unit (U267) and Crude/Coking Unit (U200)</td>
<td>Separate crude oil into petroleum coke (as a byproduct) and a variety of gases, heavy residuals, and intermediate-weight feedstocks.</td>
</tr>
<tr>
<td>Unicracker Complex (U240/244/246/248)</td>
<td>A complex of units that processes selected outputs of the Crude/Coker Unit into gasoline, diesel, and jet fuel distillate stocks as well as butane.</td>
</tr>
<tr>
<td>Ultra-Low Sulfur Diesel Hydrotreating Unit (U250)</td>
<td>Processes pre-treated renewable feedstock to produce renewable diesel and produces renewable and conventional ultra-low sulfur diesel blending stock.</td>
</tr>
<tr>
<td>Hydrotreating-Reformer Complex (MP-30)</td>
<td>A complex of process units that remove sulfur and nitrogen compounds from gasoline blendstocks.</td>
</tr>
<tr>
<td>Isomerization Unit (U228)</td>
<td>Produces a key gasoline blending stock.</td>
</tr>
<tr>
<td>Fractionation and Caustic Treatment Unit (U215)</td>
<td>Produces butane and gasoline blending stock and removes sulfur compounds from fuel gas and butane.</td>
</tr>
<tr>
<td>Product Blending Facility (U40/76/80)</td>
<td>Mixes blending stocks and additives to produce consumer-ready gasoline and diesel and delivers the products to storage tanks for transportation.</td>
</tr>
<tr>
<td>Sulfur Recovery/Amine Absorbers/Sour Water Strippers (U235, U236, and U238)</td>
<td>Remove sulfur compounds and ammonia from refinery process streams.</td>
</tr>
<tr>
<td>Main and MP-30 Flares</td>
<td>Safely control excess gas.</td>
</tr>
<tr>
<td>Fuel Gas Center (U233)</td>
<td>Removes sulfur compounds from raw fuel gas.</td>
</tr>
</tbody>
</table>

3.4.2.2 Additional Rodeo Refinery Facilities

The Rodeo Refinery also includes the Steam Power Plant, a butane storage and railcar loading facility, import/export facilities, a Wastewater Treatment Plant, a pressure-relief system/vapor-recovery system, a Hydrogen Plant, and the Carbon Plant.

Steam Power Plant

The Steam Power Plant is a cogeneration facility. The plant has three simple-cycle gas turbines to generate electricity and uses waste heat from the gas turbine exhaust to generate steam. The plant has an electricity production capacity of approximately 48 megawatts (MW). It is fueled by refinery fuel gas (RFG) (approximately 80 percent of the fuel), and when RFG is not available, it is fueled by purchased natural gas (approximately 20 percent of the fuel). The Cogeneration Plant produces enough electricity for the Rodeo Refinery’s use; if excess electricity is available, it is exported to the regional grid. The Steam Power Plant operates approximately 95 percent of the time.
Butane Storage and Railcar Loading Facility

Refinery-produced butane can be used as a gasoline blend stock or as a refinery fuel, or it can be loaded into railcars for shipment to customers. CARB regulations control the volume of butane blended into gasoline. During the summer blending season (March through October), the volume of butane added to gasoline is low to keep the volatility of the blended gasoline within CARB specifications. During the winter blending season (November through February), a larger volume of butane may be blended into gasoline to increase its volatility, again within CARB specifications.

The butane storage system consists of four storage spheres—Tank-300, Tank-301, Tank-302, and Tank-833. Two butane loading racks are located at Rodeo Refinery’s Marine Terminal Complex (Marine Terminal). During the summer blending season, isobutene (i-butane) and normal butane (n-butane) are loaded into railcars for delivery to customers. During the winter gasoline blending season, butane is used in the Rodeo Refinery. If insufficient butane is available, it can be purchased from the external market and off-loaded from railcars into the Rodeo Refinery for blending; however, this is an infrequent activity.

Currently, up to 16 railcars of butane can be loaded per day. Railcars are not used to store butane. During the winter, purchased butane can be brought into the facility from outside sources. The Rodeo Refinery has the capability to offload purchased butane; however, this activity is infrequent.

Import/Export Facilities

In addition to rail facilities, products are transported to and from the Rodeo Refinery by vessel, pipeline, and truck. Marine vessels include tugs, barges, articulated tug barges (ATBs), and tankers that move crude oil, blending stocks, and feedstock to and from the Marine Terminal, located at the northern tip of the Rodeo Site (see Figure 3-2). Existing vessel traffic, based on the 3-year baseline average of 2017 through 2019, consisted of 80 tankers of various sizes and 91 barges (non-self-propelled and ATBs combined) per year. The Marine Terminal is equipped with pumps, piping, and heavy cargo hoses to transport liquids and a thermal oxidizer to control vapor emissions. A ship’s cargo is unloaded via the pipelines, and the contents of the cargo holds are pumped to storage tanks on shore. Product ships and barges depart the Marine Terminal loaded with intermediate and refined products for other coastal cities and distribution terminals.

Pipelines are the predominant means to import crude oil and other feedstock over land. Product pipelines also distribute gasoline, diesel, and jet fuel to terminals; from these terminals, products are delivered by truck to gas stations and other Phillips 66 customers.

Some raw materials and products used at the Rodeo Refinery are imported by truck. These materials include liquid oxygen, sodium hydroxide, aqueous ammonia, amine, sulfuric acid, Stretford solution, and water-treating chemicals and additives. Molten sulfur, a byproduct from the Sulfur Recovery Plant, is loaded into trucks at a dedicated sulfur truck-loading facility. Petroleum coke is transported by conveyor from the Delayed Coker Unit to a dedicated coke truck-loading facility. Trucks also haul waste from the Rodeo Refinery, including sulfur/vanadium Stretford hazardous waste and spent catalyst.

Wastewater Treatment Plant

The Rodeo Refinery has a Wastewater Treatment Plant to treat its wastewater to reduce concentrations of pollutants to acceptable levels before discharging it to San Pablo Bay. Treatment processing consists of oil-water separation, dissolved air flotation enhanced with flocculants, powdered activated carbon treatment, clarification, and sand filtration. After filtering, the effluent is pumped through a deepwater diffuser located underneath the Marine Terminal into San Pablo Bay.

7 Articulated tug barges consist of a tank vessel (barge) and a large, powerful tug that is positioned in a notch in the stern of the barge, which enables the tug to propel and maneuver the barge.
The Rodeo Refinery Wastewater Treatment Plant is designed for a maximum treatment capacity of about 10 mgd. The flow to the treatment system is collected by four main sewer lines that deliver collected wastewater to a splitter box where the streams are mixed and then directed to sumps from which wastewater is pumped to equalization tanks. Equalization tanks are designed to provide an even, steady flow to the Wastewater Treatment Plant for optimal system effectiveness.

**Pressure-Relief Systems and Flares**

Regulations and industry standards require that every pressure-containing vessel has a pressure-relief device installed to prevent vessel damage from excessive pressure. At the Rodeo Refinery, the discharges from these pressure-relief valves are collected into a piping system for recycling or safe disposal. The piping system is known as the Blowdown System.

The Blowdown System collects and separates liquid and gaseous discharges from various process units and equipment throughout the Rodeo Refinery. The Blowdown System also collects gases that (1) are the normal byproducts of a process unit or vessel depressurization, (2) may result from an upset in a process unit, or (3) come from refinery process units during startup and shutdown or when the balance between fuel gas generation and the combustion of that gas for process heat is disrupted. The Blowdown System provides a means to recover gases and liquids relieved by the process units to maintain safe operating pressures. If the capacity of the recovery system is exceeded, the excess material is sent to the flare.

Flares are devices meant to provide for the safe disposal of gaseous wastes; ensure safe operations, thereby minimizing impacts on the community; and serve as emission control mechanisms for the Blowdown System. The flares combust flammable hydrocarbon gases and odorous compounds (such as hydrogen sulfide [H\textsubscript{2}S]), minimizing emissions of smog-forming chemicals. However, flaring events do result in emission of combusted gases. At the Rodeo Refinery, no routine flaring occurs during normal operation.

**Hydrogen Plant**

The Hydrogen Plant produces hydrogen and steam for use in hydrotreaters and other refinery processes within the Rodeo Refinery. The Hydrogen Plant includes a steam methane reformer furnace, associated stack, and other equipment, including a compressor, cooler, and associated piping. Hydrogen is generated by reacting a petroleum liquid or gas, such as butane or natural gas, with steam in the presence of a catalyst. The steam methane reformer furnace is a process furnace that is used to maintain the reactants at a temperature that favors the production of hydrogen. The exhaust gases from the steam methane reformer furnace are passed through a selective catalytic reduction gas treatment unit to reduce the emissions of oxides of nitrogen created from the combustion that takes place in the furnace. The hydrogen formed in this equipment is purified by a process called pressure swing adsorption and then is delivered to the units that use hydrogen gas in the Rodeo Refinery.

**Carbon Plant**

The Carbon Plant upgrades the petroleum coke byproduct. It is a two-kiln, petroleum coke–calcining\textsuperscript{8} operation that is integrated with cogeneration of electricity using waste heat produced by the coke–calcining process. At the Carbon Plant, raw or “green” coke is fed into a natural gas–fired rotary kiln to thermally remove associated moisture and volatile combustible matter and to otherwise improve critical physical properties such as electrical conductivity, real density, and oxidation characteristics. Exhaust emissions from the kilns are controlled by a baghouse. Process heat is captured by steam boilers and transformed into electrical power by the facility’s turbine generator. The Carbon Plant currently produces 14.2 MW of electricity, of which 2.2 MW is used at the plant and the remaining 12 MW is exported to the electrical grid.

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\textsuperscript{8} Calcining is the process of heating a solid to a temperature below its melting point to bring about a state of thermal decomposition or a phase transition other than melting.
3.4.2.3 Existing Rodeo Refinery Processing

The Rodeo Refinery is designed and operated to refine a variety of domestic and foreign crude oils. The principal activity of the Rodeo Refinery is to manufacture transportation fuels; the facility converts crude oil and other feedstock into liquefied petroleum gas, gasoline, jet fuel, and diesel fuel. Byproducts of the Rodeo Refinery include sulfur and petroleum coke. Electrical power, fuel gas, and steam are also created during the refining process.

Crude oil is brought to the Rodeo Refinery via pipeline and the Marine Terminal. Tankers and barges dock at the Marine Terminal, located at the northwestern edge of the facility. Numerous chemicals, materials, and utilities are also required to produce useful products from the crude oil. Some chemicals, such as hydrogen, are produced at the Rodeo Refinery or supplied by Air Liquide’s Hydrogen Production Plant, located adjacent to the refinery. Other feedstock, chemicals, and materials are purchased and transported to the facility.

Currently, the Bay Area Air Quality Management District (BAAQMD) permits the Rodeo Refinery to process a maximum crude oil throughput of 117,000 barrels per day. The BAAQMD permit also limits allowable emissions associated with the Rodeo Refinery, including the Marine Terminal.

Crude Oil Processing

The Rodeo Refinery processes crude oil into usable products, such as gasoline, diesel, jet fuel, fuel oil, liquefied petroleum gas, or other petroleum-based products. To produce these products, process units perform one of four basic functions:

- Separation
- Conversion
- Purification
- Blending

Separation

To carry out the process of separation, the Rodeo Refinery takes advantage of the fact that individual hydrocarbon molecules boil at different temperatures (at a specified pressure) according to the size of the molecules. As a result, a mixture of various compounds contained in a single-feed stream, such as crude oil, can be separated using a distillation column or fractionator in which the temperature decreases from the bottom to the top of the column. The smaller hydrocarbon molecules rise to the top of the column as gases. The heavier hydrocarbons fall to the bottom of the column as liquids.

In the distillation process, mixed feed stocks in crude oil are separated into distinct hydrocarbon streams or fractions. This process involves two steps. In the first step, inorganic salts are removed from the crude oil. In the second step, the crude oil is separated into several distinct hydrocarbon streams using atmospheric- and vacuum-distillation columns.

With distillation, mixed feed stocks in crude oil can be separated into distinct hydrocarbon streams or fractions. At petroleum refineries, the first main processing step is to remove inorganic impurities from the crude oil and then separate it into several distinct hydrocarbon streams using atmospheric and vacuum-distillation columns. The separation process is used in many other Rodeo Refinery units. The use of fractionators and splitter units to separate various products into distinct hydrocarbon streams is a common practice at other refineries.
**Conversion**

After the initial separation of the crude oil, fractions created from distillation are routed to process units that convert molecules into molecules more desirable for blending into finished products. Conversion of molecules is accomplished by two primary processes: cracking and reforming.

- **Cracking.** The process of cracking breaks large and cyclic molecules into smaller compounds that have chemical and physical properties better suited for the finished product. Cracking at most refineries is performed at catalytic cracking units and coking units. Catalytic cracking units use catalysts to induce chemical transformations to smaller molecules. Hydrocracking units are a class of cracking units that use hydrogen, high temperature and pressure, and catalysts to achieve the desired molecular conversions. Coking units use high temperature to induce thermal cracking.

- **Reforming.** The process of reforming transforms the shape of hydrocarbon molecules. Process units such as catalytic reformers, isomerization units, and alkylation units rearrange the chemical structures of hydrocarbon molecules without significant cracking or breaking of the molecules. These reforming process units create a high percentage of final blending components for gasoline.

**Purification**

It is necessary to remove impurities from fractions of gasoline and diesel before processing or blending them into finished products. Purification includes removing undesirable components such as hydrogen sulfide, sulfur, and nitrogen compounds. Purification is accomplished in units called hydrotreaters, where a mixture of hydrocarbons and hydrogen are heated together and then fed to a reaction chamber containing a catalyst. When the hydrocarbon and hydrogen molecules contact the catalyst, a chemical reaction occurs that converts sulfur and nitrogen molecules bound in hydrocarbon molecules to hydrogen sulfide and ammonia gases. These gases are separated from the hydrocarbon liquids and are sent to the Sulfur Recovery Plant where the sulfides are converted to elemental sulfur, which is sold as a product, and the ammonia is converted to nitrogen.

**Blending**

After separating, converting, and purifying, the final refinery process is blending. The blending process involves numerous streams from storage tanks and process vessels that are mixed (i.e., blended) into finished products. The final products contain the correct chemical and physical properties specified for each fuel.

3.4.2.4 **Existing Rodeo Refinery Maintenance Activities**

Operation of the Rodeo Refinery requires substantial ongoing maintenance activities so that:

- All Rodeo Refinery process units operate within their design parameters,
- Products meet quality and quantity goals,
- Emissions and discharge sources meet all regulatory limits, and
- Pressure-containing and other equipment meet rigorous safety requirements.

Regular maintenance is essential to the overall safe operation of the Rodeo Refinery. In addition to ongoing maintenance activities, scheduled, large-scale maintenance actions called turnarounds are also necessary. The term turnaround refers to the period of time when refinery equipment is down for maintenance and inspection and is not available to process feedstocks, compared to the typical 24-hour-a-day, 365-day-a-year operation. Equipment is regularly scheduled to be out of operation in order to:

- Inspect the internals of Rodeo Refinery vessels,
- Clean pipe and vessel internals,
• Upgrade existing Rodeo Refinery equipment and vessels,
• Replace catalysts in vessels that do not use continuous regeneration,
• Make connections for new equipment being installed at the Rodeo Refinery,
• Perform maintenance or inspection on critical equipment, and/or
• Repair and renew piping and equipment before they fail.

Turnarounds are termed *major* when significant portions of the Rodeo Refinery are shut down for extended periods. Minor turnarounds may affect only certain units, or parts of the total Rodeo Refinery, for short periods. Major turnarounds usually occur between 3 and 6 years apart. Minor turnarounds may occur once every 3 years, up to once per year. Rodeo Refinery turnarounds significantly affect production. Therefore, refinery staff plan turnarounds carefully so that work is accomplished quickly and process units can resume operation as soon as possible. As part of this planning, provisions are made so that necessary supplies and equipment are onsite and available when needed. Refinery maintenance and technical staff, as well as additional contract maintenance staff, work in shifts around the clock to minimize the duration of a turnaround. Refinery staff usually plan major unit turnarounds several years apart to maximize overall production. Also, the turnaround schedule becomes the controlling factor when planning and scheduling upgrades or other major changes to the process equipment at the Rodeo Refinery.

3.4.2.5 *Marine Oil Terminal Engineering and Maintenance Standards*

The California State Lands Commission (CSLC) developed Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) to establish standards for the design, construction, and maintenance of marine oil terminal berthing and cargo loading/unloading facilities. MOTEMS is intended to minimize the possibility of accidents at marine oil terminals during extreme weather events and seismic activity that would lead to releases of petroleum substances to the environment. Existing facilities are required to retrofit or rebuild as necessary to meet MOTEMS, which has been completed at the Rodeo Refinery’s Marine Terminal, and Phillips 66 will continue to comply with MOTEMS requirements.

3.4.2.6 *Existing Risk Management and Response Plans*

**Risk Management Plan**

Phillips 66 operates under the US Environmental Protection Agency (USEPA) Risk Management Plan (RMP) rule, California Accidental Release Prevention (CalARP) Program, and the Contra Costa County Industrial Safety Ordinance (ISO). The Rodeo and Santa Maria Refineries maintain RMPs that include three main components: (1) hazard assessment; (2) release prevention planning; and (3) emergency response planning. The RMPs are updated when there are changes that would affect the use or storage of acutely hazardous substances. A detailed hazards and operability study of the changed components is conducted prior to startup of new equipment or processes such as would be part of the Project. Upon completion of the Project, the Hazardous Materials Business Plan (HMBP) that provides input to the RMP would be updated and the RMP scenarios reviewed for potential change as a result of the Project.

**Emergency Response Plan**

An emergency response plan is in place at the Rodeo Refinery to ensure that, in the event of a fire, hazardous material release, medical emergency, or rescue situation, refinery personnel would be able to respond to the emergency quickly and effectively so that personal injuries, environmental damage, and/or property damage can be minimized. The emergency response plan describes the responsibilities of all facility personnel in the event of an emergency. Additionally, the plan defines the types of actions that personnel with different levels of training may take in response to an emergency. Furthermore, the plan
describes and defines the chain of command to be followed by personnel in an emergency. The primary responsibility for implementing the plan rests with Phillips 66, not with an outside agency.

3.4.3 **Existing Santa Maria Site**

The Santa Maria Site is located just west of California Route 1 and south of the town of Arroyo Grande in southern San Luis Obispo County (Figure 3-4). The facility, which was built in 1955, occupies approximately 1,600 acres, much of which is vacant land surrounded by undeveloped land and by commercial, industrial, recreational, agricultural, and residential uses. The Santa Maria Site includes petroleum storage and processing facilities and serves as a collection and pre-processing facility for high-sulfur heavy crude oil. The crude oil comes primarily from offshore platforms along the California coast and oil fields in the Santa Maria Valley. The majority of crude oil is delivered to the facility by pipeline (the remainder, which is approximately 2,000 barrels per day (bpd) of petroleum-based products, is delivered by truck).

The Santa Maria Site processed 26,700 bpd of crude oil in 2019 and 25,700 bbl/d of crude oil in 2020. Semi-refined liquid products from the Santa Maria Site are sent by pipeline as feedstocks to the Rodeo Refinery for upgrading into finished petroleum products. Other Santa Maria Site products include petroleum coke (a byproduct of oil refining), which is shipped by rail and truck, and granular sulfur (recovered from the crude oil), which is shipped by truck.

3.4.4 **Existing Pipeline Sites**

The Project includes the Pipeline Sites—four regional pipelines serving the Santa Maria Site and the Rodeo Refinery. The Santa Maria Site is connected to the Rodeo Refinery by approximately 200 miles of subterranean pipeline (Figure 3-5), designated Line 400 and Line 200. Line 400 runs north and east from the Santa Maria Site through the Coastal Range of central California in San Luis Obispo and Kern Counties, a region of dry grassland, pasture, and open live oak woodland, to connect with Line 200 north of McKittrick. Line 200 runs northwest up the west side of the San Joaquin Valley, through a mixture of Coastal Range grasslands and pasture and San Joaquin Valley agricultural land, and then west to the Rodeo Refinery. Line 200 runs through Kern, Kings, Fresno, Merced, Stanislaus, San Joaquin, Alameda, and Contra Costa Counties. Two other pipelines—Line 100 and Line 300—connect the Santa Maria Site to crude oil collection facilities elsewhere in California (Figure 3-5). Line 100 runs underneath San Joaquin Valley agricultural land and Coastal Range grasslands and pasture lands in Kern County, and Line 300 runs beneath agricultural land and grasslands in the Santa Maria Valley area in San Luis Obispo and Santa Barbara Counties.

3.5 **Project Overview**

Phillips 66 proposes to modify the existing Rodeo Refinery into a repurposed facility that would process renewable feedstocks into renewable diesel fuel, renewable components for blending with other transportation fuels, and renewable fuel gas. An application for an LUP was submitted to Contra Costa County in 2020. Approval of the LUP requires compliance with CEQA, including preparation of an EIR. Refer to Chapter 1, *Introduction*, for a detailed discussion of the CEQA process for the Project.
The repurposing of the Rodeo Refinery would assist California in meeting its stated goals of reducing GHG emissions and ultimately transitioning to carbon neutrality. It would also provide a mechanism for compliance with California’s LCFS and Cap-and-Trade programs and the federal Renewable Fuels Standard (RFS), while continuing to meet regional market demand for transportation fuels. The Project would produce up to 55,000 bpd of a variety of renewable transportation fuels from renewable feedstocks. The Rodeo Refinery as a whole post-Project would produce up to 67,000 bpd. To maintain current facility capacity to supply regional market demand for transportation fuels, including renewable and conventional fuels, the post-Project facility configuration could receive, blend, and ship up to 40,000 bpd of gasoline and gasoline blendstocks.

Because the Project would discontinue the processing of crude oil at the Rodeo Refinery, the Santa Maria Site would no longer be necessary to provide feedstock to the Rodeo Refinery, so it would be demolished. The Pipeline Sites that collect crude oil for the Santa Maria Site and deliver semi-refined feedstock to the Rodeo Refinery would not be necessary to transport crude oil-based feedstocks and would be taken out of service (decommissioned) or sold (Section 3.9, Project Components). In addition, the Carbon Plant would no longer be necessary and would be demolished. The existing Rodeo Refinery, Carbon Plant Site, Santa Maria Site, and Pipeline Sites are described above (Section 3.4, Project Sites). Sections 3.6 through 3.12 describe the proposed Project objectives, operational changes, modification of existing facilities, and construction and demolition.

### 3.6 Project Objectives

The Project has the following objectives:

- Convert the Rodeo Refinery to a renewable transportation fuels production facility;
- Provide/maximize production of renewable fuels to assist California in meeting its goals for renewable energy, GHG emission reductions, and reduced CI for transportation fuels;
- Convert existing equipment and infrastructure to produce transportation fuels from non-hazardous renewable feedstocks and discontinue the processing of crude oil at the Rodeo Refinery;
- Preserve and protect existing family-wage jobs in Contra Costa County during and after the transition to a renewable transportation fuels production facility;
- Repurpose and reuse the facility’s existing equipment capacity, including the Marine Terminal and Rail Butane Loading Rack;
- Preserve marine, rail, and truck offloading facilities to access national/international renewable feedstocks to provide renewable transportation fuels and conventional fuels and conventional fuel components;
- Provide the ability to process a comprehensive range of renewable feedstocks, including treated and untreated feedstocks;
- Maintain the facility’s current capacity to supply regional market demand for transportation fuels, including renewable and conventional fuels;

---

9 Governor Newsom’s Executive Order N-79-20 states: “clean renewable fuels play a role as California transitions to a decarbonized transportation sector” and “to support the transition away from fossil fuels consistent with the goals established in this Order and California’s goal to achieve carbon neutrality by no later than 2045, the California Environmental Protection Agency and the California Natural Resources Agency, in consultation with other state, local and federal agencies, shall expedite regulatory processes to repurpose and transition upstream and downstream oil production facilities...” The Governor’s Order also directs CARB to “develop and propose strategies to continue the State’s current efforts to reduce the carbon intensity of fuels beyond 2030 with consideration of the full life cycle of carbon. Additionally, the California Air Resources Board’s November 19, 2020, “California’s Greenhouse Gas Goals and Deep Decarbonization” presentation anticipates that biofuels will comprise 19 percent of the transportation “fuel” sector by 2045.”
- Ensure California transportation fuel supply needs are met during the transition to a renewable fuels facility by temporarily (approximately 7 months) increasing gas oil and crude deliveries at the Marine Terminal to maintain current transportation fuel production at the Rodeo Refinery;
- Provide a beneficial use for recyclable fats, oils, and grease (FOG) within the state of California; and
- Provide a mechanism for compliance with the federal RFS and the state LCFS through processing facilities in California.

### 3.7 Project Operation

#### 3.7.1 Product Received

Once the Project is operational, no crude oil would be processed at the Rodeo Refinery. As shown in Table 3-2, the Rodeo Refinery would no longer receive crude oil and gas oil at its Marine Terminal (35,000 bpd on a 12-month rolling average\(^\text{10}\)) or from the pipelines connecting the Rodeo Refinery to the Santa Maria Site (70,000 bpd). The Rodeo Refinery would receive 38,000 bpd gasoline and gasoline blendstocks, which is an increase over baseline of 28,000 bpd.

Up to 80,000 bpd of renewable feedstocks would be received at the Rodeo Refinery and processed in the proposed PTU. The majority of the time, the feedstocks treated by the PTU would be processed onsite to produce renewable fuels. In situations where excess treated feedstock produced by the PTU is not processed onsite, this material could be exported from the Rodeo Refinery via the Marine Terminal. Project emissions associated with processing at the PTU would be correlated with how much material is being processed and handled, rather than the specific type of material.

#### 3.7.2 Product Shipped

As shown on Table 3-2, Once operational, the Rodeo Refinery would supply up to 107,000 bpd of renewable fuels (67,000 bbl/d) and petroleum-based transportation fuels or gasoline (40,000 bbl/d). Of the 67,000 bpd of renewable fuels that would be produced, 55,000 bpd would occur as a result of the Project. This amount would be in addition to the Rodeo Refinery’s existing capability (as of 2021) of producing 12,000 bpd from pretreated feedstocks using Unit 250 (previously used to process petroleum-based feedstocks). However, renewable feedstocks and renewable fuels were not produced from Unit 250 during the CEQA baseline period in 2019 (refer to Section 3.13, CEQA Baseline); therefore, Table 3-2 indicates “0” for “Renewable Fuels Shipped.”

To maintain the current facility capability to supply regional market demand for transportation fuels, including renewable and conventional fuels, the Rodeo Refinery could receive, blend, and ship up to 40,000 bpd of gasoline and gasoline blendstocks. Table 3-2 summarizes activities associated with the future operations of the Project.

---

\(^\text{10}\) All bpd amounts are based on a 12-month rolling average, unless otherwise noted.
### Table 3-2. Rodeo Refinery Pre- and Post-Project Operational Activity

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Post-Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Received</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marine Terminal Crude and Gas Oil Received (1,000 bpd 12-month average)</td>
<td>35</td>
<td>0</td>
</tr>
<tr>
<td>Pipeline Crude Received (1,000 bpd 12-month average)</td>
<td>70</td>
<td>0</td>
</tr>
<tr>
<td>Renewable Feedstocks Received (1,000 bpd 12-month average)</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>Gasoline and Blendstocks Received (1,000 bpd 12-month average)</td>
<td>10</td>
<td>38</td>
</tr>
<tr>
<td><strong>Product Shipped</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petroleum Products Shipped (1,000 bpd 12-month average)</td>
<td>121</td>
<td>40</td>
</tr>
<tr>
<td>Renewable Fuels Shipped (1,000 bpd 12-month average)</td>
<td>0</td>
<td>67</td>
</tr>
<tr>
<td>Treated Renewable Feedstock Shipped (1,000 bpd 12-month average)</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td><strong>Mode of Transportation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tanker Vessels (calls/year)</td>
<td>80</td>
<td>201</td>
</tr>
<tr>
<td>Barges (calls/year)</td>
<td>90</td>
<td>161</td>
</tr>
<tr>
<td>Carbon Plant Site Rail (average railcars per week)</td>
<td>6.96</td>
<td>0</td>
</tr>
<tr>
<td>Refinery Railcar Loading/Unloading Rack (average railcars per day)</td>
<td>4.7</td>
<td>16</td>
</tr>
<tr>
<td>Santa Maria Site Rail (railcars per year)</td>
<td>409</td>
<td>0</td>
</tr>
<tr>
<td>Refinery and Carbon Plant Truck Trips (roundtrips per year)</td>
<td>40,213</td>
<td>16,026</td>
</tr>
<tr>
<td>Santa Maria Site Truck Trips (roundtrips per year)</td>
<td>13,008</td>
<td>0</td>
</tr>
<tr>
<td>Rodeo Refinery Approximate Number of Employees and Contractors</td>
<td>650</td>
<td>650</td>
</tr>
</tbody>
</table>

Note:

- The facility currently has the capacity to produce approximately 12,000 bpd of renewable fuels from pretreated feedstocks using Unit 250, which was previously used to process petroleum-based feedstocks. However, renewable feedstocks and renewable fuels were not produced from U250 during the baseline period in 2019 and are not included in this table.

### 3.7.3 Project Modes of Transportation

Renewable feedstocks for the Project would arrive at the facility primarily by tanker, barge, and railcar but possibly also by truck for small amounts from local sources. Future vessel call numbers would be greater than under baseline conditions (Table 3-2), and the mixture of vessel sizes and types would likely be different than under baseline conditions.

#### 3.7.3.1 Marine Traffic

Marine traffic would increase relative to the baseline period, as shown in Table 3-2. Marine traffic would include tanker vessels and barges used to import renewable feedstocks and gasoline blendstocks and export renewable fuels and feeds. Baseline vessel traffic consists of 80 tankers of various sizes and 90 barges (non-self-propelled and ATBs combined) and is estimated to increase to a total of 201 Handymax tankers and 161 ATB at full Project operation. No physical changes are needed at the Marine Terminal as part of the Project.

#### 3.7.3.2 Rail Traffic

Rail traffic at the Rodeo Refinery during 2019 consisted of one linehaul locomotive visit per day moving 4.7 cars, on average, at the railcar facility. Under the Project, rail traffic would consist of one linehaul locomotive per day moving a maximum of 16 railcars at the railcar facility. This volume of traffic is within the existing railcar loading/unloading capacity of the facility. Rail traffic at the Carbon Plant Site in 2019
consisted of approximately three linehaul visits per week, on average, and 362 railcars per year total. Under the Project, rail traffic at the Carbon Plant Site would be discontinued.

### 3.7.3.3 Truck Traffic

Truck traffic related to feedstock transport to the Rodeo Refinery would vary depending on local conditions and refinery demand. Truck traffic related to the refinery deliveries and waste byproducts in 2019 was 7,540 roundtrips per year. Truck traffic related to the transport of petroleum coke to and from the Carbon Plant Site, which totaled 32,673 round trips in 2019, would no longer occur. As a result, annual truck round trips under the Project would total approximately 16,026 truck roundtrips per year. The Project would result in a decrease from approximately 110 roundtrips per day to and from the Rodeo Refinery as a whole to approximately 44 roundtrips per day to and from the Rodeo Refinery. The Rodeo Refinery’s renewable products would be shipped from the facility by tanker vessel and pipeline.

### 3.8 Project Renewable Feedstocks

#### 3.8.1 Background

The renewable feedstocks market for the production of renewable fuels has been evolving, and will continue to evolve in the next decade and beyond. Renewable feedstocks are produced with a broad range of materials, including soybean oil, corn oil, rapeseed oil, and other vegetable oils; tallow and other animal fats; used cooking oil (UCO); FOG; and other waste oil products. The global production of renewable feedstocks has been generally sustained by the use of crop-based vegetable oils (e.g., soybean oil), which has raised concerns regarding the use of food-based agricultural products for the production of fuels. Accordingly, while food-based vegetable oils will continue to support the production of renewable feedstocks, the next generation of renewable feedstocks focuses on the use of non-food materials or waste raw materials, such as UCO, tallow, or FOG (Organisation for Economic Cooperation and Development and Food and Agriculture Organization 2019\(^{11}\)).

#### 3.8.2 Anticipated Project Feedstocks

For the Project, renewable feedstocks would be processed into renewable products as indicated in Figure 3-7 and would include both treated and untreated feedstocks. Renewable feedstock generally requires pre-treatment to remove contaminants, such as polyethylene, and purification of feedstock prior to conversion to renewable fuels. These treatments would occur in the proposed PTU, which would also include FOG recovery equipment (see Section 3.7, Project Operation). The PTU has three processing trains designed to treat a broad range of renewable feedstocks, including the feedstocks listed below and others. The anticipated renewable feedstocks processed at the facility would include, but not limited to, the following:

- UCO,
- FOG,
- Tallow (animal fat),
- Inedible corn oil,
- Canola oil,
- Soybean oil,
- Other vegetable-based oils, and/or
- Emerging and other next-generation feedstocks.

\(^{11}\) The Agricultural Outlook 2019–2028 is a collaborative effort of Organization for Economic Co-operation and Development and Food and Agriculture Organization of the United Nations.
Rodeo Facility
Post Project
Block Flow diagram

Figure 3-7: Rodeo Renewed Project Flows
Rodeo Renewed Project
Contra Costa County, CA

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File Path: R:\Cardno\Rodeo\map\Rodeo_Fig3-7_RodeoRenewed_ProjectFlows.md
Date Created: 7/19/2021  Date Revised: 7/19/2021 File Path: R:\Cardno\Rodeo\map\Rodeo_Fig3-7_RodeoRenewed_ProjectFlows.md
GIS Analyst: anna.clare
3.8.3 Speculative to Identify Specific Types or Sources of Project Renewable Feedstocks

Although the Project would process multiple renewable plant, animal, and/or waste-based feedstocks, as listed above, it is not feasible to predict with any degree of certainty the source locations and the specific types of renewable feedstocks or combinations of feedstocks that would be processed in any particular year. The renewable feedstocks that will be processed in any particular year will generally be influenced by business considerations and market conditions, as described below.

3.8.3.1 Agricultural Factors

As with all agricultural commodities, oil crops and vegetable oils are subject to risk from weather and other calamities, affecting yields and price, and ultimately, supply and demand for the commodity or for inputs\(^\text{12}\) (USDA, ERS 2020). The CME Group explains the factors that agricultural futures analysts consider in helping to determine the price of commodities.\(^\text{13}\) For example, Brazil’s soybean crop was off to a slow start in 2021 due to harvest delays and excessive rain (Wilson et al. 2021). China’s hog farms were affected by African Swine Fever in 2018, temporarily reducing soybean meal demand (Wilson et al. 2021). These factors are often unpredictable, yet affect availability and price.

3.8.3.2 Commodity Uses and Substitutions

The different uses of the commodity and whether or not there are substitutes for those commodities also affect the renewable feedstocks market. For example, soy and corn can both be used for livestock feed or human food production. If one commodity increases in price, farmers may be able to switch to the other commodity to feed their livestock for a cheaper cost (CME Group). This is particularly important for renewable feedstocks given the different uses for oilseeds, including food production and animal feedstocks, and the different vegetable oils that may be used as substitutes (e.g., canola oil may be a substitute for soybean oil).

3.8.3.3 Incentives and Government Regulations

Many countries, including the United States, have various mandates and subsidies, all of which affect the global market for renewable feedstocks. The United States regulatory programs affecting renewable fuels and feedstocks include the Renewable Fuel Standard (RFS) and the Biodiesel Tax Credit. The RFS set forth blending mandates for biodiesel fuels. The Biodiesel Tax Credit provides blenders with a tax credit equal to $1.00 for every gallon of renewable fuel blended with conventional diesel.

California has an LCFS, the primary goal of which is to reduce the CI of transportation fuels by at least 20 percent by 2030. Under the LCFS, the CARB sets on an annual basis the CI standards or benchmarks to be achieved and the CI for each type of fuel is based on GHG emissions associated with producing, transporting, and consuming that particular type of fuel—the life cycle of the fuel. Fuels with CI below the benchmark generate credits.

3.8.3.4 Transportation Costs

Another critical component of the renewable feedstock selection process for Phillips 66 will be transportation costs. Sourcing renewable feedstocks in the global market could involve substantial transportation costs for marine shipping, which must be compared to train/rail transportation costs for United States production or trucks for local production. Or, new supplies of UCO closer to California may become available in the future, making the overall cost of UCO feedstocks lower due to lower transportation costs (the transportation costs in 2024 as compared to 2021, of course, may be up or down

\(^{13}\) The CME Group is one of the largest derivatives marketplace; it comprises four exchanges—CME, CBOT, NYMEX, and COMEX.
due to the change in price of crude oil and the change in price of finished transportation fuel for marine vessels, trains, or trucks).

### 3.8.3.5 Project Feedstock Flexibility

To address these and other inherent risk factors in the market, Phillips 66 secures contracts in excess of the crude oil feedstocks supply needed to process more than 2 million barrels of crude oil per day. Phillips 66's position in the market is then adjusted as needed over time, depending on the market conditions for that year or month (or appropriate time interval).

Phillips 66 could secure market positions in oilseeds, vegetable oils, and waste oils, and by having an excess of the amounts needed for processing, Phillips 66 has the flexibility to adapt to market conditions and process the optimal mix of renewable feedstocks to achieve its business objectives. Thus, it is difficult to predict which specific types or sources of renewable feedstocks would be used in any one particular year, much less over several years.

The Project is uniquely situated to secure renewable feedstocks available through marine shipping by having direct marine access through the Marine Terminal in addition to rail and truck transportation. By having these transportation options, Phillips 66 has greater flexibility in selecting renewable feedstocks from a broad variety of sources, including international sources.

Because the Project will have the ability to process a broad range of untreated renewable feedstocks in its PTU, market conditions, such as those discussed above, for each of the types of renewable feedstocks will be considered in the selection process. Whether Phillips 66 looks more or less favorably on selecting any particular renewable feedstock to process at the Rodeo Refinery in 2024 and beyond will depend on all of the factors that comprise the costs, transportation logistics, and CI associated with that particular feedstock.

### 3.9 Project Components

The Project would require physical and/or operational changes at the Rodeo Refinery, Carbon Plant Site, Santa Maria Site, and Pipeline Sites. These proposed changes are described below.

#### 3.9.1 Rodeo Refinery

The Project would repurpose existing refinery equipment and add new equipment to convert the refinery into a facility that manufactures liquid transportation fuels from renewable feedstocks (Table 3-3, Figure 3-2).

#### Table 3-3. Process Unit Changes for the Rodeo Renewed Project

<table>
<thead>
<tr>
<th>Process Units</th>
<th>Existing Rodeo Refinery</th>
<th>Rodeo Renewed Projecta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 267 – Crude</td>
<td>Operational</td>
<td>Not Operational – Relinquish Permit</td>
</tr>
<tr>
<td>Unit 200 – Crude/Coker</td>
<td>Operational</td>
<td>Not Operational / Maintain Permit – Coker to be idled</td>
</tr>
<tr>
<td>Carbon Plant – Coke Calciner</td>
<td>Operational</td>
<td>Not Operational – Relinquish Permit</td>
</tr>
<tr>
<td>Units 236– Sulfur Recovery Unit</td>
<td>Operational</td>
<td>Not Operational – Relinquish Permit</td>
</tr>
<tr>
<td>Units 238 – Sulfur Recovery Unit</td>
<td>Operational</td>
<td>Not Operational – Relinquish Permit</td>
</tr>
<tr>
<td>Unit 244 – Reformer</td>
<td>Operational</td>
<td>Not Operational / Maintain Permit</td>
</tr>
<tr>
<td>MP-30 – Naphtha HT/Reformer</td>
<td>Operational</td>
<td>Not Operational / Maintain Permit</td>
</tr>
<tr>
<td>Unit 228 – Isomerization</td>
<td>Operational</td>
<td>Not Operational / Maintain Permit</td>
</tr>
<tr>
<td>Unit 233 – Fuel Gas Center</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Unit 215 – Fractionation and Caustic Treatment</td>
<td>Operational</td>
<td>Not Operational / Maintain Permit</td>
</tr>
</tbody>
</table>
### Process Units

<table>
<thead>
<tr>
<th>Process Units</th>
<th>Existing Rodeo Refinery</th>
<th>Rodeo Renewed Project&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 250 – DHT/Renewable Diesel</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Unit 240 – Light Hydrocracker</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Unit 246 – Heavy Hydrocracker</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Unit 248 – Jet/Aromatics Saturation</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Unit 235 – Sulfur Recovery</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Unit 100 – Wastewater Treatment</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Unit 110 – Hydrogen Plant</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Unit 40/76/80 – Blending and Shipping</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Marine Terminal</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Railcar Loading/Unloading</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Steam Power Plant – Cogen</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Main and MP-30 Flares</td>
<td>Operational</td>
<td>Operational</td>
</tr>
<tr>
<td>Sulfur Treatment Unit</td>
<td>Not Present</td>
<td>New Construction</td>
</tr>
<tr>
<td>Feed Pre-Treatment Unit</td>
<td>Not Present</td>
<td>New Construction</td>
</tr>
</tbody>
</table>

**Notes:**

<sup>a</sup> The permits for Unit 267, the Carbon Plant, and Units 236/238 will be relinquished upon startup of the Project. The permits for Unit 244, Unit 200, MP-30, Unit 215, and Unit 228 are being maintained for the possibility of future use, depending on economic and regulatory conditions. Therefore, the potential use of these units has been included as a part of the environmental analysis, and no reductions in emissions have been taken to account for the non-operational status of the units. Any future use of the units would be evaluated in accordance with CEQA and all applicable laws and regulations.

The permits for Unit 244, Unit 200, MP-30, Unit 215, and Unit 228 are being maintained for the possibility of future use, depending on economic and regulatory conditions. At this point, demolition of those units has not been scheduled. All other equipment and piping in the Rodeo Refinery that would be shut down or idled as part of the Project would be cleaned and evacuated of hazardous materials.

### 3.9.1.1 Reconfiguration of Process Units for Renewable Feedstock Processing

To accommodate the transition from processing crude oil to renewable fuels, Phillips 66 proposes to implement the following physical and operational changes to the processing units listed below:

- **U240 Hydrocracker**: Replace two existing reactor vessels at end of life. Replace and modify existing heat exchangers. Add new process surge vessel, minor chemical storage tanks, and feed filters. Retray four distillation towers.

- **U246 Hydrocracker**: Replace and modify existing heat exchangers. Add new exchangers, new minor chemical storage tanks, process pump, and feed filters. Retray two distillation towers.

- **U110 Hydrogen Plant**: Install new piping, fuel gas cooler, and control valve station to process renewable fuel gas at Unit 110 to produce renewable hydrogen.

- **Rail Butane Loading Rack**: Convert the existing butane rail loading stations to receive renewable feedstock by rail. Install new steam piping connections to warm up and liquefy renewable feed in railcars prior to unloading. For analysis purposes, impacts will be assessed based on utilizing existing rail capacity to unload up to 16 railcars per day.
Other Modifications to Existing Equipment

The remaining existing equipment and storage tanks at the Rodeo Refinery would be either repurposed for renewable feedstocks or idled for the new processes. Repurposing of equipment would include upgrading and/or re-routing existing piping and reaction chambers; adding minor ancillary components, such as catalyst or feedstock injectors; using existing facilities to allow receipt of feedstocks by tanker truck and the Marine Terminal; and storing renewable feedstocks and renewable products.

3.9.1.2 Proposed New Process Units

Feed Pre-treatment Unit

The proposed PTU would be constructed on the site of three existing storage tanks (Figure 3-2), which would be demolished. New equipment (three processing trains) would be added to decontaminate and condition the renewable feedstocks prior to processing. The decontamination process removes metals and other solids that would harm the ability of the hydrotreating units to produce renewable transportation fuel. The process includes a combination of vacuum drying, adsorption, filtration, centrifugal separation, and FOG recovery.

Once fully implemented, the Project could receive up to 80,000 bpd (12-month rolling average) of renewable feedstocks, which would be processed in the proposed PTU. Initially, however, the PTU would consist of two processing trains\(^\text{14}\) that could process approximately 53,000 bpd (12-month rolling average) of renewable feedstock. A third processing train would be added to the PTU at a later date resulting in a total processing capacity of up to 80,000 bpd. In addition, new piping would be installed to connect the new PTU to storage tanks and process units and interconnect process units.

Odor Management

To control Project-related odors, engineer control measures have been incorporated into the facility design. Engineered odor control strategies include covering potential odor-generating equipment with sealed covers, using fixed roof or floating roof tanks, reducing fugitive emissions, using scrubbing and incineration systems, and minimizing system upsets.

Odor control at the railcar unloading racks includes a sealed header system tied to activated carbon canisters. Prior to treatment all tallow feedstocks would be routed to Tank 100, which would be repurposed with a new fixed roof and nitrogen gas blanket in the vapor space. The nitrogen blanket gas would be discharged through activated carbon canisters for odor control prior to release to atmosphere. Other renewable feedstock with the potential to generate odors would be stored in the existing facility tankage that currently include odor treatment and abatement facilities.

The PTU includes a vapor collection system and vapor treatment consisting of a biofilter followed by an activated carbon adsorption bed. The biofilter would reduce most odor constituents from the collected vapor, and any residual components discharged from the biofilter would be further removed by the activated carbon bed.

Sulfur Treatment Unit

The new Sulfur Treatment Unit (STU) would include a thermal oxidizer, waste heat boiler, caustic scrubber tower, and fresh and spent caustic tanks to control ammonia and hydrogen sulfide off-gases. The STU would be located immediately adjacent to the existing Sulfur Recovery Unit (U235).

\(^{14}\) Processing trains are separate parallel sets of processing equipment doing the same function (in this case, pre-treating feed). Having two different sets, or trains, for instance, allows for one to be down for maintenance while the other continues to operate.
3.9.2 **Discontinue Use of Carbon Plant**
Following Project completion, the Rodeo Refinery would no longer produce petroleum coke feed that is suitable for the Carbon Plant Site; consequently, the Carbon Plant Site would be shut down and demolished. At this point, demolition activities have not been scheduled.

As the date of the Carbon Plant shutdown nears, Phillips 66 would begin to reduce onsite inventory of these chemicals. Any chemicals remaining onsite after the shutdown would be used elsewhere in the Rodeo Refinery or returned to the chemical supplier.

3.9.3 **Discontinue Use of Santa Maria Facility**
The Santa Maria Site processes petroleum crude oil using processes similar to those of the Rodeo Refinery. The facility receives crude oil by pipeline and truck and ships partially refined feedstock by pipeline and petroleum coke byproduct by rail. Crude oil and products are stored in tanks onsite. Because the Project would discontinue the processing of crude oil at the Rodeo Refinery, the Santa Maria Site would no longer be necessary to provide feedstock, so it would be demolished. Most existing process equipment and support infrastructure (storage tanks, buildings, onsite piping and pumps) at the Santa Maria Refinery would be demolished. At this point, Phillips 66 has no plans to reuse the Santa Maria Site, and any further reuse and remediation would be subject to subsequent environmental analysis, as applicable.

3.9.4 **Pipeline Sites**
The Pipeline Sites are located throughout the state in San Luis Obispo, Santa Barbara, Kern, Kings, Fresno, Merced, Stanislaus, San Joaquin, Alameda, and Contra Costa Counties. The Project would not involve construction or modifications at the Pipeline Sites (i.e., Lines 100, 200, 300, and 400). Upon completion of the Project, the Pipeline Sites (Figure 3-5) would be unnecessary to transport crude-based feedstocks to the Rodeo Refinery. However, the Pipeline Sites are currently being marketed for sale. If a sale is completed, the pipelines could continue to operate at the discretion of the new owner.

For purposes of analysis, it is assumed that Phillips 66 would decommission the Pipeline Sites. The pipelines would be cleaned and taken out of service, or sold; they would not be excavated as part of this Project. Phillips 66 would empty and clean the collection points with pipeline inspection gages (PIGs). The PIGs are inserted into the line via PIG traps. The PIG is then forced through the pipelines sweeping the inside walls along the way by scraping the sides and pushing along any debris with it. PIGs are also used to inspect the interior condition of the pipeline to detect and prevent problems such as corrosion, deformations and metal loss.

Material removed from the pipelines would be handled in accordance with applicable regulations and standard practices, which include processing as much as possible in Phillips 66 refining facilities and disposing of the remainder in approved facilities, including hazardous waste facilities, as appropriate.

3.10 **Overall Project Construction/Demolition Phase**
The Project would involve construction and demolition activities at the Rodeo Site and demolition activities at the Santa Maria Site and Carbon Plant Site. Construction at the Rodeo Site would take approximately 21 months and is assumed to begin as early as the first quarter of 2022 (Figure 3-8). Demolition of the Santa Maria Site would begin once the necessary demolition permits are obtained from San Luis Obispo County and other regulatory agencies, which Phillips 66 expects will occur in 2022.
Other construction activities including, but not limited to, soil boring equipment, heavy lift construction cranes, and metallic welding would be used to support the construction/demolition phase at each site. All related construction activities would occur within boundaries of each site (except for one laydown area as described below for the Rodeo Site). Construction cranes would be used to lift and maneuver equipment and piping into place. Soil boring equipment would be used to install pier foundations for equipment support structures. Field welding would be required to complete the installation of pre-fabricated structural steel and piping sub-assemblies.

**3.10.1 Construction/Demolition Safety Plan at Each Site**

Phillips 66 would prepare a Project Construction Safety Plan for each site that would address site safety during the construction and demolition phases. The Construction Safety Plan would address excavation practices, confined space work, heavy equipment and vehicle operations, hot work, lifting and hoisting, working at heights, scaffolding and other forms of access, safe isolation of energy, and simultaneous operations (construction during non-turnaround period when units are operating).

**3.10.2 Fire Protection**

As required by the Contra Costa County Fire Protection District, Phillips 66 will prepare a Management of Change (MOC) for the refinery process unit modifications that would enable it to shift to processing renewable feedstocks. The MOC would include an assessment of the refinery process changes on process piping corrosion, including the frequency of piping inspections. The Project would likely have multiple MOCs for the different phases of the Project.

Prior to construction, Phillips 66 would submit design documents and specifications to the Fire Protection District for its review and approval of the installation, repair, or modification of process piping and equipment containing flammable and combustible liquids to ensure compliance with the minimum fire and safety requirements. The MOC and the design documents and specifications would be prepared after design review has been completed and all discretionary agency permits have been issued.

**3.11 Transitional Phase**

The transitional phase represents a temporary 7-month increase in Marine Terminal vessel traffic at the Rodeo Refinery that occurs at the same time as Project construction at the Rodeo Refinery. During the transitional phase, the Rodeo Refinery would continue to refine crude oil into petroleum products. However, because Phillips 66 would idle its Santa Maria Site and discontinue use of the Pipeline Sites to transport petroleum-based feedstocks to the Rodeo Refinery, delivery of petroleum-based feedstocks to the Rodeo Refinery via the Pipeline Sites would decrease and eventually cease during the transition to renewable feedstocks. It is possible that all or a portion of the Pipeline Sites would be transferred to a third-party and/or used in a different service. However, for purposes of analysis it is assumed the pipelines would be decommissioned.

To procure alternative crude oil feedstock during construction, the Rodeo Refinery may temporarily increase deliveries of crude oil and gas oil feedstocks by tanker vessel, resulting in increased annual vessel calls to the Marine Terminal compared to baseline conditions. The estimated vessel traffic during this period is shown in Table 3-4. This temporary increase of crude and gas oil feedstocks at the Marine Terminal would not increase the amount of crude and gas oil that can be processed at the Rodeo
Refinery, but it would shift the source of these materials from the Pipeline Sites to the Marine Terminal. The temporary increase in vessel traffic is estimated to last a maximum of 7 months in the year prior to Project startup and would occur parallel to the end of the construction period (see Figure 3-8). No modifications to the Marine Terminal or MOTEMS are proposed.

Table 3-4. Marine Terminal Traffic and Crude/Gas Oil Deliveries during Transitional Phase

<table>
<thead>
<tr>
<th>Activity</th>
<th>Baseline</th>
<th>Transitional Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude and Gas Oil Received through Marine Terminal (1,000 barrels/day 12-month average)</td>
<td>35</td>
<td>85</td>
</tr>
<tr>
<td>Pipeline Crude Received (1,000 barrels/day 12-month average)</td>
<td>70</td>
<td>0</td>
</tr>
<tr>
<td>Tanker Vessels (calls/year)</td>
<td>80</td>
<td>96</td>
</tr>
<tr>
<td>Barges (calls/year)</td>
<td>90</td>
<td>92</td>
</tr>
</tbody>
</table>

In 2019, the Rodeo Refinery processed approximately 105,000 bpd of crude oil and gas oil (approximately 70,000 of which arrived via Line 200 and 35,000 of which arrived via the Marine Terminal). Crude oil and gas oil deliveries via the Marine Terminal during the transitional period would peak at up to 85,000 bpd (12-month rolling average), which would temporarily exceed the current BAAQMD Title V permit limit of 51,182 bpd (12-month rolling average), for which a permit will be acquired.\(^\text{15}\) This short-term increase would not require any changes to the Marine Terminal facilities. Once the Project is completed (estimated to be in early 2024), all deliveries of crude oil and gas oil would cease, and the deliveries of renewable feedstock by vessel would commence.

Phillips 66 commits to forgo the processing of heavy Canadian crude oil in the event the current Title-V permit limit of 51,182 bblr/d (12-month rolling average) is exceeded, in alignment with previous commitments associated with the Marine Terminal throughput increase permit.

3.12 Site-Specific Construction and Demolition

The following sections describe the general construction/demolition activities, shut down and decontamination procedures, excavation and grading, amount of debris generated, and construction-related traffic associated with each of the Project sites.

3.12.1 Demolition and Construction Overview

All demolition and construction associated with the Project would be conducted in accordance with established procedures and BMPs and in compliance with applicable regulations and permits. Soil and construction debris generated by construction activities would be either re-used onsite or transported offsite for recycling or disposal as appropriate.

3.12.1.1 Rodeo Refinery Demolition and Construction

At the Rodeo Refinery, including the Rodeo Site and the Carbon Plant Site, construction would employ up to 500 workers at a time; the construction workforce is expected to be drawn from the greater East Bay region within a 1-hour commute distance. Construction would involve heavy equipment, such as loaders, earthmovers, cranes, and concrete trucks, and lighter-duty equipment, such as welders and compressors. Construction daily traffic may peak at 500 worker vehicle roundtrips, 165 heavy-duty hauling truck

\(^\text{15}\) Title V permit limits also apply to gasoline range material that can be shipped from the Marine Terminal (25,000 bpd on a 12-month rolling average).
roundtrips, and 30 delivery/vendor vehicle round trips per day would access the construction site via the Cummings Skyway route.

As described in Section 3.9, *Project Components*, equipment and piping to be removed would be drained and cleaned prior to demolition. The following wastes could be generated during construction and demolition:

- Steel equipment and piping,
- Spent welding rods,
- Concrete,
- Wood trash,
- Asbestos and other insulation,
- Debris, and
- Cardboard and refractory.

### 3.12.1.2 **Santa Maria Site**

Santa Maria demolition construction would employ approximately 18 workers per day; the construction workforce peak traffic is assumed to be 36 worker trips per day commuting for a distance of 13 miles, each way. Demolition would involve heavy equipment, such as loaders, excavators, cranes, and rough terrain forklifts, and lighter-duty equipment, such as welders and generators. Total truck hauling trips are estimated to be 731 one-way trips over the duration of the demolition period (262 days), based on 5,800 cubic yards demolition material to be moved. As described in Section 3.9, *Project Components*, equipment and piping to be removed would be drained and cleaned prior to demolition. Wastes associated with demolition of the Santa Maria Site would be the same as that for the Rodeo Refinery.

### 3.12.2 **Excavation and Grading—Rodeo Site, Carbon Plant Site and Santa Maria Site**

Excavation would be required to install new foundations for process equipment and other equipment at the Rodeo Site. Clean, excavated soil would be combined with soil from clean stockpiles located on the Rodeo Site. Grading would be performed as necessary.

Excavated soil during construction or demolition would be tested in accordance with state and federal regulations for waste characterization. Any excavated soil exceeding applicable waste characterization thresholds would be disposed at an offsite licensed waste disposal facilities based on its characteristics. Non-hazardous soil would be extracted from onsite locations and used as fill, as appropriate.

### 3.12.3 **Construction and Demolition and Parking and Laydown Areas—Rodeo Site, Carbon Plant Site and Santa Maria Site**

During construction and demolition, parking and onsite services would be provided within the boundary of the individual sites, except for one laydown area, an asphalt area at the Selby site associated with the Rodeo Site (Figure 3-2).

Parking would be provided for workers, equipment, or delivery drivers primarily onsite, or at adjacent properties owned by Phillips 66. Temporary administrative, sanitary, and comfort services would be provided in areas designated for these purposes within each site. In addition to the laydown areas, small areas throughout the sites would be used for temporary storage and staging of materials and equipment.
3.12.4 **Debris and Waste—Rodeo Site, Carbon Plant Site and Santa Maria Site**

Any demolished equipment would be cut up, salvaged, and recycled. Phillips 66 would remove and dispose of recycled equipment in compliance with all applicable regulations. An asbestos and lead survey would be performed prior to the initiation of demolition, and required permits would be obtained, as needed, from the appropriate agencies. For construction impact estimation purposes, approximately 19,400 tons of waste would be generated from the Santa Maria and Carbon Plant Sites.

3.12.5 **Construction/Demolition Traffic**

Project demolition and construction would generate additional construction and personal vehicle trips. Vehicular traffic would include construction workers, management employees, administrative personnel, and delivery truck drivers.

At the Rodeo Refinery, the number of workers in the anticipated peak day is approximately 500 workers. At the Santa Maria Site, the number of workers in the anticipated peak day is approximately 18 workers.

3.12.6 **Shutdown Process and Decontamination Procedures**

For all sites, the process unit and equipment shutdown and decontamination process would follow all applicable health, safety and environmental requirements.

3.12.6.1 **Rodeo Refinery and Santa Maria Site**

For process units at the Rodeo Refinery, labeled as *Not Operational* as part of the Rodeo Renewed Project in Table 3-3, the shutdown process would generally include the actions noted below. The first four actions would occur within 6 months of ceasing processing of hydrocarbons pending regulatory approvals. The shut-down and demolition process for the Santa Maria Site would also include all of the actions below:

- Complete final process runs. Shut down all equipment.
- Drain and remove process hydrocarbon contents of equipment. Depending on equipment’s former process (i.e., materials used and stored), a combination of some or all of the following would be used: steam purges, water flushes, hydrocarbon flushes, and vapor phase (soap) flushes. Specific protocols for would depend on the types of material and residuals present in the equipment and its structural design.
- Blind and air gap equipment and open the equipment to the atmosphere. Disconnect all equipment from any operating process.
- De-energize electrical equipment from any live electricity sources.
- Applies to units prior to any demolition, if applicable. Develop inspection schedules for out-of-service pressure equipment, piping, and other structures and use qualified personnel to complete these inspections.
- In addition to actions above, develop and complete demolition plans for process units labeled as *Relinquish Permit* in Table 3-3.

3.12.6.2 **Pipeline Sites**

The process of decommissioning the Pipeline Sites would include the following actions, which are anticipated to be completed within 6 months of final process runs.

- Complete final process runs. Shut down all equipment.
• Drain and remove process hydrocarbon contents of equipment. Purge product using nitrogen and a combination of some or all of the following: disc, cup, brush or foam pigging (pigging is the use of a mechanical device, or PIG, to clean and perform other maintenance on pipelines). Specific protocols would depend on the types of material and residuals present in the equipment and its structural design.

3.13 CEQA Baseline

This EIR is a factual document, prepared in conformance with CEQA, and written to make the public and decision-makers aware of any potential environmental consequences of the proposed Project. The EIR evaluates the Project within its environmental context, and analyzes the potential environmental impacts compared to an existing condition or baseline. The CEQA baseline is the point or span in time or the set of conditions against which expected future environmental conditions associated with a proposed Project are compared. Changes relative to the baseline environmental conditions resulting from the Project represent the environmental impacts that must be disclosed under CEQA. Therefore, definition of an appropriate baseline is an integral part of the CEQA process.

Section 15125 of CEQA provides the following guidance for establishing the baseline:

(a) An EIR must include a description of the physical environmental conditions in the vicinity of the project. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to provide an understanding of the significant effects of the proposed project and its alternatives. The purpose of this requirement is to give the public and decision makers the most accurate and understandable picture practically possible of the project’s likely near-term and long-term impacts.

(1) Generally, the lead agency should describe physical environmental conditions as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. Where existing conditions change or fluctuate over time, and where necessary to provide the most accurate picture practically possible of the project’s impacts, a lead agency may define existing conditions by referencing historic conditions, or conditions expected when the project becomes operational, or both, that are supported with substantial evidence. In addition, a lead agency may also use baselines consisting of both existing conditions and projected future conditions that are supported by reliable projections based on substantial evidence in the record.

The baseline year is typically selected as the year in which the NOP is released for a proposed Project. However, the lead agency has the discretion to select a more appropriate baseline year for purposes of the environmental analysis conducted in the EIR if conditions warrant such a selection and is supported by substantial evidence (Neighbors for Smart Rail v. Exposition Metro. Line Constr. Auth., 57 Cal. 4th 439, 449 [2013] [agency has discretion to decide how existing physical conditions are to be realistically measured, subject to support by substantial evidence]).

The COVID-19 pandemic and its effects on the economy of the San Francisco Bay Area and the northern California region, warrants consideration of a baseline year other than 2020, the year that the NOP was released (December 21, 2020). Contra Costa County determined that for most resource areas 2019 is the appropriate baseline year, which is the same as the physical environmental conditions in the vicinity of the Project as they existed prior to the COVID-19 pandemic.
The pandemic specifically affected consumer demand for refined petroleum fuels and on refinery production. Contra Costa County considered different baseline scenarios with technical input from the BAAQMD and Phillips 66. In addition, Contra Costa County determined that the baseline for analysis of facility emissions should be different than the baseline for marine vessel emissions. The following discussion explains in detail why 2020 is not an appropriate baseline for the Project and identifies more historically representative baseline periods for facility emissions and marine vessel emissions.

3.13.1 2020 Is Not Appropriate Baseline Year due to the COVID-19 Pandemic

As a result of the COVID-19 pandemic, which caused a decrease in demand for petroleum fuels, throughput at the Rodeo Refinery facilities (Refinery and Carbon Plant) in 2020 was approximately 15 percent lower than the more typical throughput of previous years (2016–2019), as shown in Table 3-5. As a result of the COVID-19 pandemic, which caused a decrease in demand for petroleum fuels, throughput at the Rodeo Refinery facilities (Refinery and Carbon Plant) in 2020 was approximately 15 percent lower than the more typical throughput of previous years (2016–2019), as shown in Table 3-5. This irregularity indicates that 2020 was not a representative year for refinery and carbon plant operations compared to prior years.

Table 3-5. Historical Throughput for Rodeo Refinery Facilities (Refinery and Carbon Plant Combined)

<table>
<thead>
<tr>
<th>Type</th>
<th>Units</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedstocks</td>
<td>MBPD</td>
<td>117</td>
<td>124</td>
<td>125</td>
<td>120</td>
<td>104</td>
</tr>
<tr>
<td>Products</td>
<td>MBPD</td>
<td>118</td>
<td>126</td>
<td>127</td>
<td>121</td>
<td>105</td>
</tr>
</tbody>
</table>

Note: MBPD = thousand barrels per day

3.13.2 Baseline for Rodeo Refinery Facility Emissions

Annual facility emissions for the Rodeo Refinery\(^{16}\) and neighboring Carbon Plant\(^{17}\) during recent years are summarized in Table 3-6.\(^{18}\) After review of throughput trends and facility emissions at the Rodeo Refinery, Contra Costa County determined that the most representative and reasonably conservative\(^{19}\) CEQA baseline for analysis of facility emissions is calendar year 2019. This determination is based on the following:

- The year 2019 is the most recent full calendar year prior to the NOP release date (December 21, 2020).
- Market conditions during 2020 were unusual as a result of the COVID-19 pandemic.
- As shown in Table 3-6, emissions of the criteria pollutants nitrogen oxides (NO\(_x\)), sulfur dioxide (SO\(_2\)), carbon monoxide (CO), precursor organic compounds\(^{20}\) (POC), and GHGs were lower in 2019 than in 2018 and therefore more conservative for the EIR analysis due, in part, to lower annual throughput (Table 3-5).

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\(^{16}\) BAAQMD Permit to Operate Emission Invoices (plant 21359).

\(^{17}\) BAAQMD Permit to Operate Emission Invoices (plant 22).

\(^{18}\) Although the Carbon Plant is proposed to be shut down as part of the Project, the Carbon Plant is included in the baseline as it reflects relevant physical conditions.

\(^{19}\) Under CEQA, conservative assumptions are purposely used to avoid understatement or underestimating of a project’s impact on the environment, or to “err on the side of caution.”

\(^{20}\) An alternative term for ozone-forming VOC.
• The further reduction in SO$_2$ from 2018 to 2019 reflects the installation of sulfur oxides control equipment at the Carbon Plant to comply with lower SO$_2$ emission limits in BAAQMD Regulation 9 Rule 14 that went into effect January 1, 2019.

• The most recent 3-year (2018–2020) average for facility emissions is higher or similar to the baseline of 2019. Although they are similar, 2019 was chosen as the baseline year for the facility emissions due to the modifications implemented at the Carbon Plant as a result of BAAQMD Regulation 9 Rule 14. A 5-year or 3-year average baseline was not selected because they would not be representative of the emissions under this regulation. Furthermore, a 2019 baseline year requires analysis of greater project emissions impacts relative to the baseline period and also reduces the amount of emissions reduction credits that can be claimed when the Carbon Plant is shut down. Thus, 2019 is a more conservative baseline than a 3-year or 5-year average.

**Table 3-6. Annual Stationary Source Emissions for San Francisco Rodeo Refinery Facilities (Refinery and Carbon Plant Combined)**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen Oxides (NO$_x$)</td>
<td>Tons/Year</td>
<td>590</td>
<td>547</td>
<td>626</td>
<td>535</td>
<td>523</td>
<td>561</td>
<td>564</td>
</tr>
<tr>
<td>Sulfur Dioxide (SO$_2$)</td>
<td>Tons/Year</td>
<td>1,829</td>
<td>1,677</td>
<td>2,004</td>
<td>1,421</td>
<td>1,255</td>
<td>1,560</td>
<td>1,637</td>
</tr>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>Tons/Year</td>
<td>213</td>
<td>85</td>
<td>125</td>
<td>103</td>
<td>285</td>
<td>171</td>
<td>160</td>
</tr>
<tr>
<td>Precursor Organic Compounds (POC) / Hydrocarbons</td>
<td>Tons/Year</td>
<td>166</td>
<td>287</td>
<td>122</td>
<td>119</td>
<td>118</td>
<td>120</td>
<td>162</td>
</tr>
<tr>
<td>Particulate Matter with a Diameter of 10 Microns or Less (PM$_{10}$)</td>
<td>Tons/Year</td>
<td>94</td>
<td>93</td>
<td>102</td>
<td>95</td>
<td>89</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Particulate Matter with a Diameter of 2.5 Microns or Less (PM$_{2.5}$)</td>
<td>Tons/Year</td>
<td>92</td>
<td>91</td>
<td>97</td>
<td>90</td>
<td>81</td>
<td>89</td>
<td>90</td>
</tr>
<tr>
<td>Greenhouse Gas Carbon Dioxide Equivalent (CO$_2$e)</td>
<td>Metric Tons/Year</td>
<td>1,380,677</td>
<td>1,435,813</td>
<td>1,450,566</td>
<td>1,338,496</td>
<td>1,290,629</td>
<td>1,359,897</td>
<td>1,379,236</td>
</tr>
</tbody>
</table>

**3.13.3 Baseline for Marine Vessel Emissions**

Contra Costa County determined that marine vessel activity warrants a different baseline compared to that described above for facility emissions. Vessel activity has a different operational cycle than facility operations, with vessel activity varying by as much as 50 percent from year-to-year. Table 3-7 summarizes vessel activity from 2016 through 2020.

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21 Under CEQA, conservative assumptions are purposely used to avoid understatement or underestimating of a project’s impact on the environment, or to “err on the side of caution.”
### Table 3-7. Annual Vessel Traffic at Rodeo Refinery Marine Terminal

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Barge Visits</td>
<td>83</td>
<td>63</td>
<td>73</td>
<td>135</td>
<td>86</td>
<td>90</td>
<td>98</td>
</tr>
<tr>
<td>Tanker Visits</td>
<td>81</td>
<td>82</td>
<td>76</td>
<td>84</td>
<td>63</td>
<td>81</td>
<td>74</td>
</tr>
<tr>
<td>Total</td>
<td>164</td>
<td>145</td>
<td>149</td>
<td>219</td>
<td>149</td>
<td>170</td>
<td>172</td>
</tr>
</tbody>
</table>

*Note: 3-year average numbers used in the analysis were averaged and rounded by vessel category and tier level group, which results in a lower baseline and larger tanker increase being evaluated.

As shown in Table 3-7, vessel activity was substantially higher during 2016 and 2019 than during 2017, 2018 and 2020, with 2019 having the highest vessel activity; i.e., 219 visits, compared to other years. Unlike facility operations as discussed above, where the change in emissions in 2019 reflected regulatory changes that would continue in the future, vessel activity could be lower in the future. Therefore, use of 2019 as the baseline year for vessel activity may be characterized as over-stating baseline conditions, thus underestimating Project impacts. In contrast, using either 2017 or 2018 as the baseline year would understate physical conditions, thus overestimating Project impacts. For comparison purposes, the 3-year average from 2018 through 2020 is also provided in Table 3-7, showing a total number of vessels at 172, similar to the 2017–2019 baseline of 170 vessels.

Therefore, to provide for a characterizing environmental analysis for marine vessel emissions, the baseline is a 3-year average, from 2017 through 2019, i.e., 170 visits comprising 53 percent barges and 47 percent tankers, which is a reasonably balanced mid-range value that would avoid underestimation or overestimation of Project impacts.

#### 3.13.4 Baseline Comparison to Martinez Refinery Renewable Fuels Project EIR

The Marathon Petroleum Corporation has also submitted a land use application with Contra Costa County for a renewable fuels project, the Martinez Refinery Renewable Fuels Project. As with the Rodeo Renewed Project, Marathon proposes to modify and repurpose their existing refinery to discontinue production of fossil fuels and produce renewable fuels from sources including, rendered fats, soybean and corn oils, and other cooking or vegetable oils. Both projects essentially have the same objectives, which include eliminating refining of crude oil while preserving jobs, assisting California to achieve its renewable energy goals, and produce fuels that reduce GHG emissions, particulate matter, and other pollutants by providing cleaner burning fuels.

Although the two projects are very similar, two different CEQA baseline approaches are used. As described above, for the Rodeo Renewed Project Contra Costa County determined that two baselines are appropriate for CEQA analysis; one for facility emissions (2019) and one for marine vessel emissions (3-year average of 2016 through 2019).

However, for the Martinez Refinery Renewable Fuels Project Contra Costa County determined the most appropriate baseline is a 5-year average between October 1, 2015 and September 30, 2020, for both facility and marine vessel emissions. This 5-year baseline captures a high throughput year (Year 3), as well as two comparably lower throughput years (Year 1 and Year 5), reflecting the variation in production at the Refinery. Likewise, the 5-year baseline captures the Refinery’s turnaround cycle22, including two years in 2016 and 2020 when no equipment turnarounds occurred and air emissions would have been higher because all equipment was in operation.

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22 The term turnaround refers to the period of time when refinery equipment is down for maintenance and inspection and is not available to process feedstocks, compared to the typical 24-hour-a-day, 365-day-a-year operation.
Although different, both baseline approaches were determined to be representative and reasonably conservative for purposes of the CEQA analysis. Both baselines reflect actual operating conditions, given the fluctuations in the market as a result the COVID-19 pandemic that affected production in 2020, and differing assumptions related to active versus inactive refinery equipment as a result of turnarounds, which increase overall facility emissions. Comparing baseline averages (5 years for Martinez Refinery, both facility and vessel emissions, versus 1 year facility emissions and 3 years vessel emissions for Rodeo Refinery), the Rodeo Renewed Project baseline does not use a 5-year average for facility emissions because it would not be representative of actual emissions due to the modifications at the Carbon Plant that were made as a result of BAAQMD Regulation 9 Rule 14, which requires reduced SO2 emissions. Therefore, for the Rodeo Renewed Project assumes the 1-year 2019 average, which is more conservative.

3.14 References


