



MARTINEZ RENEWABLE FUELS

CALIFORNIA ENVIRONMENTAL QUALITY ACT - PROJECT DESCRIPTION



LEAD AGENCY: CONTRA COSTA COUNTY

DATE: SEPTEMBER 10, 2020

1.0 INTRODUCTION

Marathon Petroleum Corporation is proposing the Martinez Renewable Fuels Project (proposed project) at its existing Martinez Refinery (site). The proposed project would convert the existing Martinez Refinery from its current production of fossil fuels (i.e., conventional diesel fuel, gasoline, distillates, propane, and various by-products) to the production of renewable fuels, including diesel, propane and naphtha. The proposed project would allow the Martinez Refinery to meet the growing demand in California for renewable fuels. The Refinery is currently permitted to refine approximately 161,000 barrels per day (bpd) of crude oil. After completion of the project, the facility's capacity will be approximately 48,000 barrels per day (bpd) of renewable feedstocks. Many of the overall facility's other operations, including the receipt, storage, and shipment of petroleum-based transportation fuels, would continue, although with some modification of existing equipment.

The proposed project consists primarily of a change in operation rather than a change in facilities (i.e., construction), as it would mostly use existing refining equipment and transportation facilities. The major change in operations would be the elimination of crude oil processing and the use of renewable feedstocks to manufacture renewable fuels. The renewable feedstocks are expected to include biological based oils (i.e. soybean oil and corn oil), rendered fats, and other miscellaneous renewable feedstocks including used cooking oils or other vegetable oils.

Modifications to several refinery units are needed to accommodate the renewable feedstocks. The change in refinery operation would not increase volumes of truck, rail, and vessel traffic above historic refinery operations, because those are largely dictated by the overall capacity of the refining equipment, which would be less than that of the refinery's current petroleum refining capacity. New emission units will be limited to a raw feedstock pretreatment unit and a thermal oxidizer. Numerous existing refinery units are expected to be shutdown. The air emissions from operating the facility using renewable feedstocks would decrease substantially as a result of the process changes.

2.0 PROJECT OBJECTIVES

The objectives for the proposed project include:

- (1) Providing renewable fuels to allow California to achieve significant progress towards meeting its renewable energy goals
- (2) Producing renewable fuels that significantly reduce the generation of greenhouse gas emissions, as well as other criteria pollutants including particulate matter
- (3) Converting the Marathon Martinez Refinery to a renewable fuels production facility
- (4) Eliminating the refining of crude oil at the Martinez Refinery, while protecting high quality jobs
- (5) Reducing emissions from mobile sources by providing lower emitting fuels
- (6) Repurposing/reusing existing critical infrastructure, to the extent feasible, to minimize construction activities
- (7) Completion of CEQA process by October 2021

3.0 PROJECT DESCRIPTION

In order to accomplish the project objectives, existing process units (e.g., Gas Oil Hydrotreater, Hydrocracker, and Distillate Hydrotreater) will be used to the extent feasible with some minor modifications. Most of these modifications are associated with upgrading the metallurgy of the existing equipment so that it can process renewable feedstocks (e.g., soybean oil, corn oil, rendered fats, and other miscellaneous renewable feedstocks). Certain new units will be installed including a new renewable feedstock Pretreatment Unit, wastewater treatment equipment, and an advanced, three-stage low NO_x thermal oxidizer. Refinery equipment not associated with the Renewable Fuels Project or product distribution activities will be shutdown (Crude Unit, Gasoline Hydrotreater, Alkylation Unit, Fluidized Catalytic Cracking Unit, Reformers, Delayed Coker, Steam Boilers, and other units). The processing rate of the Martinez Refinery is currently at 161,000 bpd of crude oil, which is expected to decrease to approximately 48,000 bpd of renewable feeds when the facility only uses renewable feedstocks.

The Marathon Martinez Renewable Fuels Project will be developed as discussed below.

No. 3 Hydrodesulfurization Unit: The first units to be altered for renewable feedstock operation will be the No. 3 Hydrodesulfurization Unit, the second stage of the Hydrocracking Unit (HCK2), and the No 5 Gas Plant. The No. 3 Hydrodesulfurization Unit features two reactors, both of which will be lined with high chemical resistance stainless steel. Supporting feed pipelines and heat exchangers may also be replaced-in-kind or receive metallurgical upgrades. The No. 3 Hydrodesulfurization Unit is expected to process approximately 17,000 bpd of feedstock. Additional modifications to the unit include modifications to the temperature monitoring system; pump modifications and new pumps; and additional upgrades to cooling and sour water handling.

As part of the repurposing of equipment and redesign of processes, one or more of the three reactors in the second stage of the Hydrocracking Unit will be utilized for isomerization (dewaxing). These reactor(s) (termed the ISOM reactor), will ultimately accept stripped product from each of the three hydrotreater units (No. 2 and No. 3 Hydrodesulfurization Unit and first stage of the Hydrocracker Unit). After undergoing isomerization, the renewable diesel product from the isomerization reactor will be fed to the existing stabilizer for flash point control and then pumped as final product to existing diesel tankage.

During this segment of the project, the No. 5 Gas Plant will also undergo minor alterations as well as the addition of the thermal oxidizer in the existing sour water stripper. The Gas Plant will be used to process recovered gases and light hydrocarbon liquids from the three hydrotreater units. The Gas Plant will produce renewable products including naphtha, propane and treated fuel gas. The treated fuel gas will be combusted in the facility process heaters and other combustion devices. Minor modifications to the Gas Plant Absorber, Deethanizer, and Depropanizer are required to achieve product recovery, along with relocating existing compressors from Martinez's Reformer Unit to serve as the Off Gas Compressors. The Thermal Oxidizer is an advanced three-stage, low NO_x thermal oxidizer designed to control emissions from the foul water stripper vent stream.

New equipment purchased and installed during this phase will include new H₂S adsorption vessels to remove hydrogen sulfide from the recovered fuel gas. A new dimethyl disulfide (DMDS) supply vessel and metering pumps are required to serve the No. 3 Hydrodesulfurization Unit, the No. 2 Hydrodesulfurization Unit and the Hydrocracker Stage 1. DMDS is continually injected to sulfide the Hydrodeoxygenation (HDO) catalysts in the aforementioned units.

Pretreatment Unit: The installation and construction of the Pretreatment Unit will allow for removal of impurities from the renewable feedstocks before processing in the HDO Units. The unit will allow for the use of raw feedstocks such as crude soybean oil, raw tallow, crude distillers corn oil, and other renewable feedstocks. New equipment purchased and installed during this phase will consist of a raw feed surge drum and charge pump, a wash water surge drum and charge pump, a citric acid surge drum and pump, heat exchangers and coolers as required to meet Pretreatment Unit operating conditions, a water / oil separator, and wash water effluent pH neutralization and cooling.

Wastewater Treatment: The Pretreatment Unit produces a wastewater stream that will require treatment prior to discharge to the existing wastewater treatment facility. Existing tanks will be utilized and repurposed for equalization and biological treatment of the waste stream. New equipment purchased and installed during this phase will consist of specialized wastewater treatment equipment to reduce biological oxygen demand in the waste stream.

Hydrocracker Stage 1 and 2; and No. 2 Hydrodesulfurization Unit: The reactors in the first stage of the hydrocracking unit will also undergo metallurgical upgrades by adding a high chemical resistant stainless-steel lining and are expected to process an estimated 14,700 bpd of renewable feedstocks. This phase will require only minor pump and pipe modifications; metallurgical upgrades to cooling, water handling, and sour water equipment, and the temperature monitoring systems will be upgraded. New equipment purchased and installed during this phase will include a high-pressure cold separator and treat gas-effluent exchangers.

The No. 2 Hydrodesulfurization Unit will be refitted with a new reactor and is expected to process approximately 16,000 bpd of renewable feed. Similar metallurgical upgrades will be made for water handling and product separating equipment. Additional new equipment purchased and installed during this phase will include a Reactor Effluent Air Cooler (REAC).

The project is expected to continue to use certain existing units, including storage tanks, interconnecting piping, wastewater treatment, hydrogen plants, cogeneration units, some cooling towers, flares, loading and unloading facilities, and existing No. 1 Gas Plant equipment.

The project is expected to result in the shutdown of a number of existing refinery units including the Fluid Catalytic Cracking Unit, Butadiene Plant, Crude Units, Gasoline Hydrotreater, Naphtha Hydrotreater, Vacuum Unit, Isomerization Unit, tanks and spheres, Alkylation Unit, Reformers, Benzene Saturation Unit, Amine Regeneration Unit, Sulfur Recovery Unit and Delayed Coker, among others. Certain equipment in the Delayed Coker including the charge heater, pumps, feed drums and steam generation equipment will be re-used in the renewable project.

Transportation and Logistics: Refinery feedstocks and products are transported to and from the Refinery using trucks, rail, marine vessel, and pipeline. Most of the existing truck traffic is to haul petroleum coke and transportation fuels. Truck traffic associated with the Renewable Fuels Project is expected to remain about the same where petroleum coke trucks will be replaced with renewable diesel product.

Existing rail traffic at the Refinery averages about 13 railcars per day with a peak of 27 railcars per day. The Renewable Fuels Project will utilize existing railcar loading racks. Initially, rail traffic will not substantially change, however, depending on the future transportation and logistical plans, rail traffic could increase to over 50 cars per day. This increase in rail, however, would be offset by reductions in other modes of transportation. These transportation scenarios will be more fully described in the Environmental Impact Report.

The Refinery uses two marine terminals for materials shipping and receipt, the Avon and Amorco Marine Terminals. The Avon Marine Terminal is primarily used for distribution of products from the Refinery. Under the proposed renewable project, the Avon Marine Terminal would be converted from distribution only to both receiving feedstocks and receipt and distribution of products. The Amorco Terminal is currently used primarily to receive crude oil. Under the proposed renewable project, the Amorco Marine Terminal would be converted from receiving crude to distributing renewable diesel products. The two marine terminals currently handle approximately 160 ships per year. Under the proposed project, the two marine terminals are expected to handle up to 35% fewer ships per year. As discussed in the introduction, current petroleum-based transportation terminal operations would continue.

3.0 SUMMARY OF ENVIRONMENTAL RESOURCES

The proposed modifications constitute a “project” as defined by California Environmental Quality Act (CEQA). To fulfill the purpose and intent of CEQA, Contra Costa County is the “lead agency” for this proposed project and is required to address the potential environmental impacts associated with the proposed project. Since the processing rate of the Martinez Refinery is expected to decrease from approximately 161,000 bpd of crude to 48,000 bpd of renewable feedstocks, the potential environmental impacts that require more detailed review under CEQA are expected to be limited to the following environmental resources.

- **Air Quality and Greenhouse Gas Impacts:** The proposed project will result in the shutdown of a number of refinery units, but will also result in modifications to existing units and new stationary sources (e.g., Pretreatment Unit and Thermal Oxidizer) and changes to the delivery of feedstocks and distribution of products. The potential change in criteria, toxic, and greenhouse gas emissions will need to be evaluated.
- **Biological Resources:** The proposed project will require pipelines from the marine terminals to the Refinery to be heated via electric heat tracing to keep the renewable feedstocks in liquid form as they are transported. Construction activities may be needed along portions of the pipelines which may be located in the wetland areas near the Refinery and these potential impacts need to be evaluated.
- **Hazards and Hazardous Materials:** The proposed project is expected to reduce a number of hazards and hazardous materials associated with the operation of the Refinery. New

operations and new chemicals could potentially be used, and their potential impacts need to be evaluated.

- **Hydrology and Water Quality:** The proposed project is expected to result in a reduction in water use and wastewater discharge. The changes in use need to be evaluated but are not expected to result in any impacts.
- **Transportation:** The proposed project is expected to result in a reduction in the transportation of feedstocks and products to and from the facility. The changes in the transport of materials to and from the facility via truck, rail, pipeline, and ship need to be evaluated but overall, aggregate transportation impacts are expected to be less than current operations.
- **Tribal Cultural Resources:** As a project under CEQA, the proposed project requires notification to Native American Tribes, and potential consultation if requested by the tribes.

All other environmental resources on the CEQA checklist will need to be addressed (e.g., aesthetics, agricultural/forestland resources, land use, public services, etc.), but the project impacts are expected to be less than significant or result in no impacts, so minimal analysis is expected to be required. A draft of the CEQA checklist will be provided by the project applicant.