4.3 Air Quality

4.3.1 Introduction

This section analyzes and evaluates the potential impacts of the Project on regional and local air quality from both stationary and mobile sources of air pollutants at the Rodeo Refinery, Santa Maria Site and Pipeline Sites. Discussed are the physical and regulatory settings, the baseline for determining environmental impacts, the significance criteria used for determining environmental impacts, and potential impacts associated with Project construction and demolition, the transitional phase, and operation and maintenance.

Analysis of potential impacts related to emissions of GHGs, and climate change are provided in Section 4.8, *Greenhouse Gas Emissions*.

4.3.2 Environmental Setting

This setting description provides an overview of local and regional information related to climate and meteorology, existing air quality conditions, sensitive receptors, and the air quality attainment status pertaining to the Project sites. As described in Chapter 1, *Project Description*, the Project sites include the Rodeo Refinery in northwestern Contra Costa County, consisting of the Rodeo Site and Carbon Plant Site, the Santa Maria Site in San Luis Obispo County, and four pipeline systems that collect crude oil for the Santa Maria Site and deliver semi-refined feedstock to the Rodeo Refinery (referred to hereafter as the Pipeline Sites).

4.3.2.1 Climate and Meteorology

The potential for pollutants to concentrate at a given location depends upon the quantity of pollutants emitted into the atmosphere in the surrounding area or upwind, and the ability of the atmosphere to disperse the contaminated air. The atmospheric dispersion is a function of factors such as topography and meteorology.

Rodeo Refinery

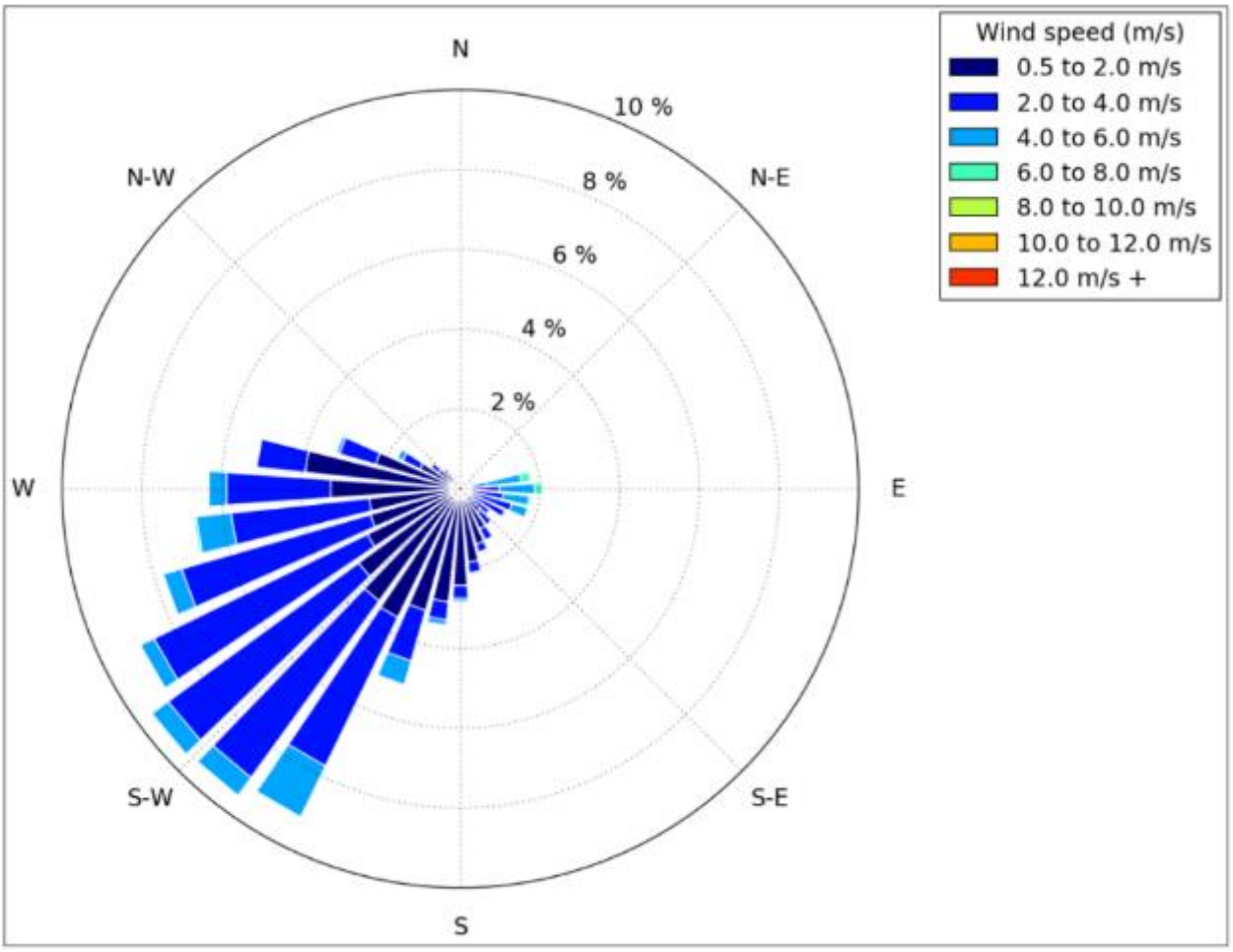
The climate of the greater San Francisco Bay Area, including Rodeo, is a Mediterranean-type climate characterized by warm, dry summers and mild, wet winters. The dominant feature of this climatic regime is a large, semi-permanent high-pressure system generally located over the eastern Pacific Ocean off the West Coast of North America. In winter, the Pacific high-pressure system generally weakens and shifts southward, allowing storms originating over the North Pacific to pass through the region. During summer and fall, air pollutant emissions generated within the Bay Area are often trapped near the ground due to the restraining influences of topography and atmospheric temperature inversions, which can lead to elevated pollutant concentrations. As these pollutants—the most significant of which are nitrogen oxides (NOx), reactive organic gases (ROG),[24] sulfur dioxide (SO_2), and particulate matter (PM)—are transported further inland by the prevailing sea breeze and exposed to sunlight, they can undergo chemical reactions that lead to formation of so-called secondary photochemical pollutants, primarily ozone (O_3) and secondary particulates consisting of sulfates, nitrates and condensed organic material.

Within the greater Bay Area, air pollution is typically lowest at locations close to the Bay, due largely to good ventilation and less influx of pollutants from upwind sources. The occurrence of light winds in the evenings and early mornings occasionally results in elevated pollutant levels. Wind flow patterns are controlled by air circulation in the atmosphere, which is affected by air pressure and the variable topography of the coastal areas adjacent to the Carquinez Strait, the only sea-level gap between San Francisco Bay and the Central Valley. Prevailing winds in the Rodeo area are from the southwest passing through the entrance to the

[24] Also referred to as VOC or precursor organic compounds (POC)

Carquinez Strait. During the summer and fall months, high pressure offshore coupled with low pressure in the Central Valley causes marine air to flow northeastward through the Carquinez Strait toward Suisun Bay and the Delta. The wind is strongest in the afternoon, with speeds of 15 to 20 miles per hour (mph) or approximately 7 to 9 meters per second (m/s) commonly occurring throughout the region of the Carquinez Strait. Annual average wind speeds are 8 mph (3.6 m/s) in Rodeo, and 9 to 10 mph (4 to 4.5 m/s) farther east. Wind speeds may be strong locally in areas where air is channeled through a narrow opening, such as the Carquinez Strait. Figure 4.3-1 displays the windrose, which is a graphical summary of wind speed and direction information, for the Rodeo Refinery. The windrose shows the heavy influence of coastline orientation and the predominance of wind from the southwest.

The air flowing in from the coast to the Central Valley, called the sea breeze, begins developing at or near ground level along the coast in late morning or early afternoon. As the day progresses, the sea breeze layer deepens and increases in velocity while spreading inland. The depth of the sea breeze depends in large part upon the height and strength of the inversion. If the inversion is low and strong, and hence stable, the flow of the sea breeze would be inhibited, and stagnant conditions are likely to result. Low wind speed contributes to the buildup of air pollution. Light winds occur most frequently during periods of low sun (fall and winter, and early morning) and at night.

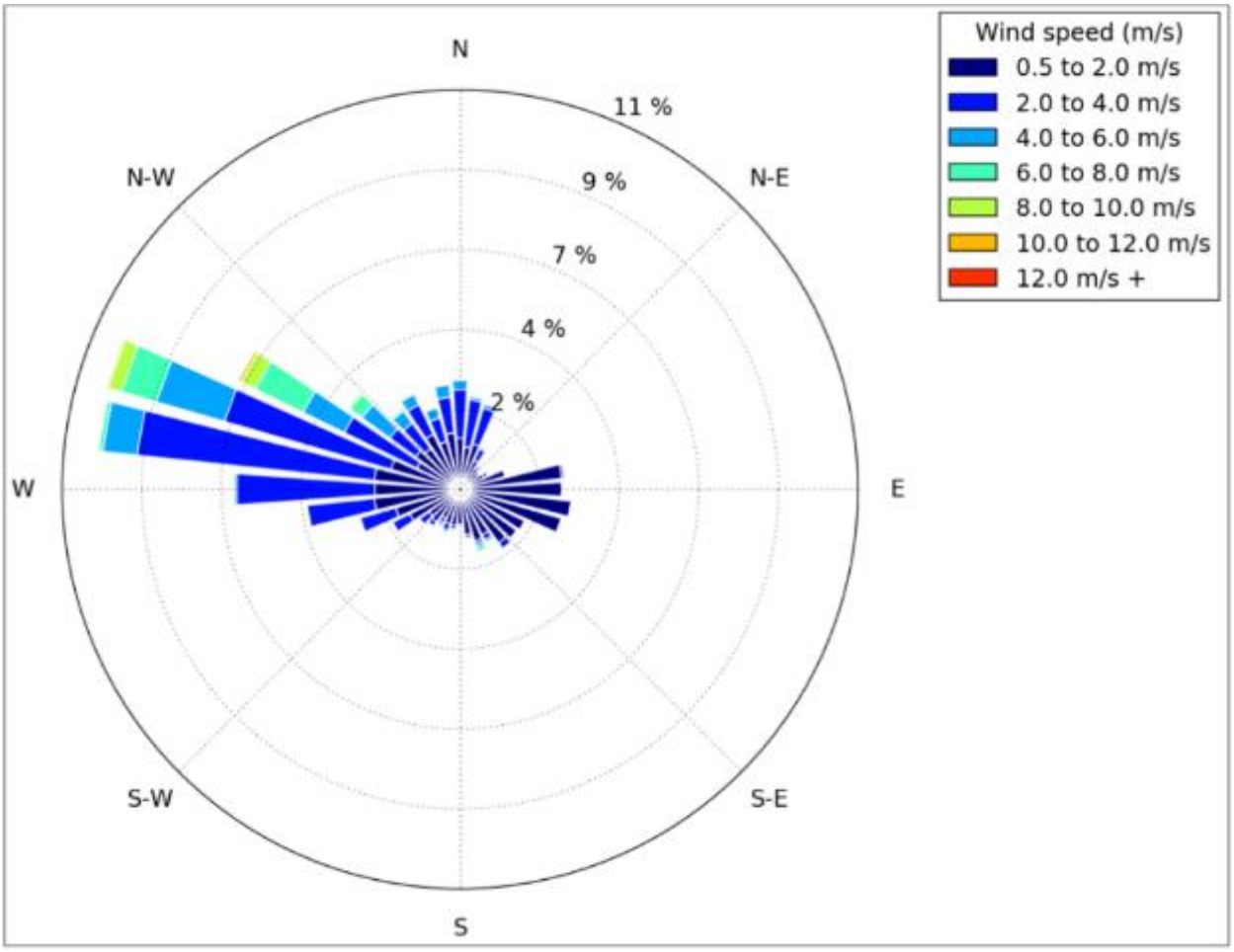


Sources: BAAQMD 2021; BAAQMD 2013–2017 (CP Rodeo Met Station)

Figure 4.3-1. Windrose for the Phillips 66 Rodeo Refinery

Santa Maria Site

The Santa Maria Site is located on a coastal plateau in California's Central Coast region in San Luis Obispo County. Similar to the San Francisco Bay Area, the Central Coast has a Mediterranean climate with warm dry summers and cool wet winters although with higher average temperatures and less precipitation due to its more southerly location. Weather at the Santa Maria Site is strongly influenced by its close proximity to the Pacific Ocean. As at Rodeo, the speed and direction of local winds are controlled by the location and strength of the Pacific high pressure, temperature differences between the coast and inland areas, and topographical factors. Winds within the vicinity of the Santa Maria Site are summarized by the wind rose in Figure 4.3-2. Prevailing winds are onshore from the west-northwest with less frequent episodes of offshore winds from the east-southeast.



Sources: San Luis Obispo County APCD meteorological data; CARB 2021a (Nipomo Guadalupe Road (Mesa2) monitoring station 2020); CARB 2021b

Figure 4.3-2. Nipomo Meteorological Station Wind Rose

Pipeline Sites

The Pipeline Sites generally run inland northeast from in and around the Santa Maria Site over the Coast Range and then northwest along the eastern edge of the San Joaquin Valley to the Delta where it turns west toward Rodeo (see Figure 3-5 in Chapter 3, *Project Description*). The inland portions of the pipelines mostly lie east of the Coast Range in or near the San Joaquin Valley where the ocean influence is greatly reduced resulting in a more continental climate with hotter summers and cooler winters. Inversions frequently form over the San Joaquin valley, which tend to trap pollutants near the surface, particularly during the winter.

4.3.2.2 Criteria Air Pollutants

The USEPA has identified criteria air pollutants that are a threat to public health and welfare. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare criteria (see Section 4.3.2.6, *Regulatory Setting*). Below are descriptions of criteria pollutants that are a concern in the Project area.

Ozone

Ozone is an oxidant and a respiratory irritant and that increases susceptibility to respiratory infections. Exposure to ozone can also cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere but is a secondary air pollutant formed in the atmosphere through a complex series of photochemical reactions primarily involving precursor organic compounds (POC) and NO_x in the presence of sunlight (ultraviolet radiation). Significant ozone production generally requires ozone precursors to be present at concentrations above background levels in strong sunlight with light winds hours. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional inversions that limit the amount of mixing in the atmosphere.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is an air quality pollutant of concern because it acts as a respiratory irritant. NO_2 is a major component of the group of gaseous nitrogen compounds commonly referred to as NO_x. A precursor to ozone formation, NO_x is produced by fuel combustion at high temperatures such as in internal combustion engines in motor vehicles, off-road equipment including ships, locomotives, and aircraft, and stationary engines and boilers such as those located at industrial and commercial facilities. Typically, NO_x emitted from fuel combustion is in the form of nitric oxide (NO) and NO_2. Upon release into the atmosphere, NO is rapidly converted to NO_2 through reaction with ozone or other oxidants.

Carbon Monoxide

Carbon monoxide (CO) is a non-photochemically reactive pollutant that is a product of incomplete fuel combustion where CO is formed instead of carbon dioxide (CO_2) due to deficient oxygen. Higher CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions can result in reduced dispersion of emissions which can result in localized high concentration "hotspots" if mass emissions of CO are high enough. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia. However, while once problematic in urban settings, CO "hotspots" are now rare due to the use of modern catalytic exhaust controls on motor vehicles that further oxidize nearly all CO to CO_2.

Particulate Matter

Particulate matter less than 10 microns in diameter (PM_{10}) is roughly one-twentieth the diameter of a human hair. It is small enough to remain suspended in the air for long periods and be easily inhaled into the air passages where it can cause adverse health effects. Particulate matter less than 2.5 microns in diameter ($PM_{2.5}$, which is roughly 3 percent of the diameter of a human hair) is so small that it can be inhaled deep into the lungs where it can cause more severe health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. According to a study by the CARB, exposure to ambient $PM_{2.5}$ can be associated with approximately 14,000 to 24,000 premature annual deaths statewide (CARB 2009). Particulates can also damage materials and reduce visibility.

Other Criteria Pollutants

Sulfur dioxide (SO_2) is a combustion product of sulfur or sulfur-containing fuels such as coal. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter (both PM_{10} and $PM_{2.5}$) and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. Lead (Pb) has a range of adverse neurotoxic health effects and was formerly released into the atmosphere primarily via the combustion of leaded gasoline. The phase-out of leaded motor gasoline has resulted in greatly reduced levels of atmospheric lead. However, lead is still used in aviation gasoline as an octane booster and valve lubricant for piston engine aircraft.

4.3.2.3 Toxic Air Contaminants

Toxic air contaminants (TACs) are chemicals known to cause adverse health effects in sensitive populations when exposed over short or long periods of time. Exposure may occur via various pathways including inhalation, dermal contact, or ingestion, and health effects may be acute (short-term), chronic (long-term), or carcinogenic (cumulative).

Local TAC sources include industrial activity in the vicinity of the Project site, shipping and other maritime activities through the San Pablo Bay and Carquinez Straits, and emissions from motor vehicles and trains using the area's highway, roadway, and rail transportation network. Like criteria pollutant emissions, TAC emissions result from the operation of stationary source facilities, and from mobile sources such as passenger automobiles and light-duty trucks, other mobile equipment such as portable diesel generators, ships, and harbor craft such as tugboats, cargo handling equipment, heavy duty trucks and construction equipment, and rail locomotives.

Different TACs are emitted from different types of sources. For example, a major TAC emitted by mobile sources is diesel particulate matter (DPM), including very small 10-micron particles (referred to as PM_{10}) and even smaller 2.5-micron particles (referred to as $PM_{2.5}$). DPM is a composite TAC containing a variety of hazardous substances, including carcinogens.

4.3.2.4 Existing Air Quality

Rodeo Refinery (San Francisco Bay Area)

The BAAQMD operates a regional air monitoring network that measures ambient concentrations of the six criteria pollutants, although not at all monitoring sites. Existing and probable future levels of air quality in the region can generally be inferred from these ambient air quality measurements. In aggregate, the major criteria pollutants of concern in the San Francisco Bay Area (i.e., ozone, PM_{10}, $PM_{2.5}$, CO, NO_2, and SO_2) are monitored at several locations, while some monitoring sites measure ozone, CO, NO_2, and $PM_{2.5}$ only. Background ambient concentrations of pollutants are determined by emissions in a given area, and wind patterns and meteorological conditions for that area. As a result, background concentrations can vary among different locations within Contra Costa County. However, areas located close together and exposed to similar wind conditions can be expected to have similar background pollutant concentrations. The nearest monitoring station to the Rodeo Refinery that measures concentrations of all of the major pollutants of concern is in Vallejo. The Rodeo Refinery operates a fenceline monitoring system as required by BAAQMD Regulation and AB1647. Table 4.3-1 shows a summary of air quality for 2017–2019 at the Vallejo air monitoring station, including peak values, averages, and number of days on which concentrations exceeded the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS).

The San Francisco Bay Area Air Basin (SFBAAB) is in nonattainment with state and federal ozone and $PM_{2.5}$ standards, and state PM_{10} standards. As shown in Table 4.3-1, there were no exceedances of the state 1-hour ozone standard at the Vallejo monitoring site in 2018 and 2019. Both the state and federal 8-hour ozone standards were exceeded one day in 2019 at the Vallejo station, and two days in 2017. There were no exceedances of the 24-hour federal $PM_{2.5}$ standard at the Vallejo monitoring site in 2019. Exceedances in 2017 and 2018 may be attributable to wildfire smoke. From 2017 through 2019, there were no exceedances of the state or federal $PM_{2.5}$ annual average standards during the summary period. As indicated in the table, no violations of the applicable CO, NO_2, or SO_2 standards were recorded at the Vallejo station during 2017, 2018, or 2019. PM_{10} information was not reported from the Vallejo site. As shown in Table 4.3-2, In 2019, there were no exceedances of the 24-hour federal and state PM_{10} standards at the San Francisco and San Pablo sites. Table 4.3-1 summarizes the data from the Vallejo monitoring site for 2017, 2018, and 2019, the range of baseline years for the proposed Project.

For reference, Table 4.3-2 summarizes these data for other BAAQMD monitoring sites that include the Vallejo, Berkeley Aquatic Park, Laney College Freeway, Oakland, Oakland West, Richmond, San Francisco, and San Pablo for the year 2019 and for 2017 through 2019 in instances where 3-year average is noted.

Table 4.3-1. Baseline Air Quality Data Summary (2017–2019) for the Vallejo Monitoring Site

Pollutant/Statistic	2017	2018	2019
Ozone			
Maximum 1-hour (ppb)	105	70	92
State 1-hour Days Exceedance	1	0	0
Maximum 8-hour (ppb)	88	55	76
NAAQS Exceedance Days	2	0	1
CAAQS Exceedance Days	2	0	1
3-year Average (ppb)	56		
Carbon Monoxide			
Maximum 1-hour (ppm)	3.1	2.8	2.0
Maximum 8-hour (ppm)	2.1	2.4	1.5
Exceedance Days	0	0	0
Nitrogen Dioxide			
Maximum 1-hour (ppb)	49	57	53
Annual Average	8	8	7
NAAQS 1-hour Exceedance Days	0	0	0
CAAQS 1-hour Exceedance Days	0	0	0
Sulfur Dioxide			
Maximum 1-hour	5.9	6.7	10.9
Maximum 24-hour	2.1	1.8	1.9
NAAQS Exceedance Days	0	0	0
CAAQS Exceedance Days	0	0	0
PM_{10}			
Annual Average	--	--	--
Maximum 24-hour Average	--	--	--
NAAQS 24-hour Exceedance Days	--	--	--
CAAQS 24-hour Exceedance Days	--	--	--
$PM_{2.5}$			
Maximum 24-hour ($\mu g/m^3$)	101.9	197.2	30.5
NAAQS 24-hour Exceedance Days	9	13	0
3-year Average of Annual 98th Percentile 24-hour Average ($\mu g/m^3$)	48		
Annual Average ($\mu g/m^3$)	11.6	13.3	8.6
3-year Average of Annual Average ($\mu g/m^3$)	11.2		

Sources: BAAQMD 2018, 2019, 2020

Notes: -- = Indicates air pollutant is not monitored for this site.
$\mu g/m^3$ = microgram per cubic meter
CAAQS = California Ambient Air Quality Standards
Maximum 1-hour / Maximum 8-hour / Maximum 24-hour = The highest average pollutant concentration over a 1-hour period, an 8-hour period (on any given day), or a 24-hour period (from midnight to midnight)
NAAQS = National Ambient Air Quality Standards
ppb = parts per billion
ppm = parts per million
State 1-hour Days Exceedance = The number of days during the year for which the station recorded pollutant concentrations exceeding the California standard

Table 4.3-2. Air Quality Data Summary (2019 and 2017–2019 Average) for BAAQMD Monitoring Sites in Vallejo and the Coastal and Central Bay Region

Pollutant/Statistic	Vallejo	Berkeley Aquatic Park	Laney College Fwy	Oakland	Oakland-West	Richmond	San Francisco	San Pablo
Ozone								
Max 1-hour (ppb)	92	50	--	98	101	--	91	103
State 1-hour Days Exc.	0	0	--	1	1	--	0	1
Max 8-hour (ppb)	76	42	--	73	72	--	73	79
NAAQS Exc. Days	1	0	--	2	1	--	1	2
CAAQS Exc. Days	1	0	-	2	1	--	1	2
3-Year Avg (ppb)	56	40	-	49	48	--	49	52
Carbon Monoxide								
Max 1-hr (ppm)	2.0	5.6	1.5	3.3	2.4	--	1.2	1.8
Max 8-hr (ppm)	1.5	1.3	1.0	1.1	1.7	--	1.0	0.9
Exc. Days	0	0	0	0	0	--	0	0
Nitrogen Dioxide								
Max 1-hr (ppb)	53	50	58	62	50	--	61	42
Annual Avg	7	13	15	9	12	--	10	7
NAAQS 1-hr Exc. Days	0	0	0	0	0	--	0	0
CAAQS 1-hr Exc. Days	0	0	0	0	0	--	0	0
Sulfur Dioxide								
Max 1-hr	10.9	--	--	--	19.2	16	-	17.6
Max 24-hr	1.9	--	--	--	2.7	3.7	-	1.9
NAAQS Exc. Days	0	--	--	--	0	0	-	0
CAAQS Exc. Days	0	--	--	--	0	0	-	0
PM_{10}								
Annual Avg.	--	--	--	--	--	--	14.7	16.5
Max 24-hr Avg.	--	--	--	--	--	--	42	36
NAAQS 24-hr Exc. Days	--	--	--	--	--	--	0	0
CAAQS 24-hr Exc. Days	--	--	--	--	--	--	0	0
$PM_{2.5}$								
Max. 24-hr ($\mu g/m^3$)	30.5	28.8	28.5	24.7	29.3	--	25.4	35.9
NAAQS 24-hr Exc. Days	0	0	0	0	0	--	0	1
3-Yr Avg of Annual 98^{th} Percentile 24-hr Avg ($\mu g/m^3$)	48	42	45	44	45	--	44	44
Annual Avg ($\mu g/m^3$)	8.6	9.4	7.4	6.7	7.8	--	7.7	7.8
3-Yr Avg of Annual Avg ($\mu g/m^3$)	11.2	10.1	11.1	9.3	11.7	--	9.7	10.4

Source: BAAQMD 2020a

Notes: -- = Indicates air pollutant is not monitored for this site.
$\mu g/m^3$ = microgram per cubic meter
CAAQS = California Ambient Air Quality Standards
Exc. = Exceedance
Max 1-hr/Max 8-hr/Max 24-hr = The highest average pollutant concentration over a 1-hour period, an 8-hour period (on any given day), or a 24-hour period (from midnight to midnight)
NAAQS = National Ambient Air Quality Standards
ppb = parts per billion
ppm = parts per million
State 1-hr Days Exc. = The number of days during the year for which the station recorded pollutant concentrations exceeding the California standard

Santa Maria Site and Pipeline Sites

The San Luis Obispo County Air Pollution Control District (APCD) is located within the South Central Coast Air Basin (SCCAB), which also includes Santa Barbara and Ventura counties. San Luis Obispo County has nine air quality monitoring stations (the Grover Beach meteorological monitoring site was closed in 2019). The CARB operates the stations in Paso Robles and in San Luis Obispo as part of their network, while the other seven sites (Atascadero, Carrizo Plain, CDF, Mesa2, Morro Bay, Nipomo Regional Park, and Red Hills) are operated by the San Luis Obispo County APCD. The monitors closest to the Santa Maria site are the Mesa2 and CDF sites (both within 1 mile). The Mesa2 site monitors PM_{10} and $PM_{2.5}$ and the CDF (Arroyo Grande) site monitors PM_{10}, $PM_{2.5}$, and SO_2. The Nipomo Regional Park monitor measures ozone and PM_{10} and is located at West Tefft Street and Pomeroy Road, approximately 5 miles east of the Santa Maria facility. The Santa Maria facility has established a fenceline monitoring system as required by AB 1647.

Currently, San Luis Obispo County is classified as nonattainment for the state and federal ozone standards and of the state PM_{10} standard (Table 4.3-3). Only the eastern portion of the county is classified by the USEPA as nonattainment with respect to the federal ozone standard. Violations of the state PM_{10} standard have been associated with windblown dust from the Oceano Dunes State Vehicular Recreation Area (ODSVRA) and occasional episodes of windblown dust from the San Joaquin Valley (San Luis Obispo County APCD 2020). A study performed by the San Luis Obispo County APCD evaluated the relative contributions of off-road vehicle use at the ODSVRA, adjacent agricultural fields, and coke piles at the Santa Maria Site to episodes of elevated PM_{10} concentrations on the Nipomo Mesa (San Luis Obispo County APCD 2010). This study concluded that off-road vehicle activity in the ODSVRA and its effects on dune surfaces is a major contributing factor to the high PM_{10} concentrations and that neither the outdoor storage of petroleum coke at the Santa Maria Site nor agricultural fields or activities in and around the area are a significant source of ambient particulate matter on the Nipomo Mesa.

Table 4.3-3. Summary of Air Quality Data from Monitoring Sites Near the Santa Maria Site

Monitor Name[a]	Pollutant	Standard	2017	2018	2019
Ozone					
NRP	Max. 1-hour conc. (ppm)		0.076	0.063	0.064
NRP	Expected Number of Days Exc. State 1-Hour Std.	0.09 ppm	0	0	0
NRP	Max 8-hour conc. (ppm)	0.070 ppm	0.071	0.055	0.054
NRP	No. Days Exc. 8-Hour Std.	0.070 ppm	1	0	0
NRP	8-Hour NAAQS D.V.	0.070 ppm	0.06	0.058	0.056
PM_{10}					
NRP	Max 24-Hour Conc. (µg/m^3)	50 µg/m^3	103.1	87.6	142.7
NRP	No. Days Exc. State Standard	50 µg/m^3	20.1	20.4	na
NRP	No. Days Exc. Federal Standard	150 µg/m^3	0	0	0
NRP	Annual Average (State)	20 µg/m^3	25.9	25.2	na
Mesa2	Max 24-Hour Conc. (State) (µg/m^3)	50 µg/m^3	113.3	126.8	141.2
Mesa2	No. Days Exc. State Standard	50 µg/m^3	na	40.4	40.6
Mesa2	No. Days Exc. Federal Standard	150 µg/m^3	0	0	0
Mesa2	Annual Average (State)	20 µg/m^3	na	28.5	25.6
CDF	Max 24-Hour Conc. (State) (µg/m^3)	50 µg/m^3	149.1	119.2	138.1

Monitor Name[a]	Pollutant	Standard	2017	2018	2019
CDF	No. Days Exc. State Standard	50 µg/m^3	na	55.6	56.5
CDF	No. Days Exc. Federal Standard	150 µg/m^3	0	0	0
CDF	Annual Avg. (State)	20 µg/m^3	na	30.2	26.7
$PM_{2.5}$					
CDF	Daily Max (National)	35 µg/m^3	32.1	46.8	26.2
CDF	Annual Avg. (National)	12 µg/m^3	9.6	8.8	6.1
Mesa2	Daily Max (National)	35 µg/m^3	26.3	38.3	23.6
Mesa2	Annual Avg. (National)	12 µg/m^3	9.1	7.6	7

Source: CARB iADAM database

Notes: µg/m^3 = microgram per cubic meter
na = not available
PM_{10} = particulate matter with a diameter of 10 microns or less
$PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less
ppm = parts per million

[a] Monitors in Nipomo Regional Park

Recent air quality conditions recorded by monitoring sites near the Santa Maria Site are summarized in Table 4.3-3. The federal 8-hour maximum ozone concentration standard was exceeded one day across the 3-year period from 2017 through 2019 in 2017 at the Nipomo-Regional Park (NRP) monitoring site. The state 24-hour maximum concentration PM_{10} standard was exceeded 20.1 days in 2017 and 20.4 days in 2018 at the NRP site, 40.4 days in 2018 and 40.6 days in 2019 at the Mesa2 site, and 55.6 days in 2018 and 56.5 days in 2019 at the CDF site. No exceedances of the federal 24-hour maximum concentration PM_{10} standard occurred at the NRP, Mesa2, and CDF sites from 2017 through 2019. The federal daily maximum $PM_{2.5}$ concentration standards were exceeded in 2018 at the CDF and Mesa2 sites.

4.3.2.5 Sensitive Receptors

For the purposes of this air quality analysis, as well as the analysis in Section 4.9, *Hazards and Hazardous Materials*, sensitive receptors are places with people who are considered more sensitive than others to air pollutants. The reasons for greater-than-average sensitivity include pre-existing health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time and because of the potential presence of pregnant women, infants, and children, with associated greater exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise, particularly by children, associated with some forms of recreation places a high demand on the human respiratory system.

Rodeo Refinery

The Bayo Vista residential neighborhood contains the nearest non-residential sensitive receptors to the active area of the Rodeo Refinery (e.g., schools, day care centers, libraries). The closest such sensitive receptor is a day care center, located approximately 1,200 feet (365 meters) southwest of the refinery. The closest residences in the Bayo Vista residential neighborhood to the southwest are approximately 700 feet (213 meters) away from the Rodeo Refinery fenceline and approximately 1,475 feet (450 meters) from the proposed PTU area, the closest Project component. To the north, the Tormey residential

community is located approximately 1,200 feet (365 meters) from the refinery fence line and approximately 3,700 feet (1,130 meters) from the closest Project component.

Santa Maria Site

The nearest residential receptors to the Santa Maria Refinery are located approximately 2,000 feet (610 meters) to the northeast of the nearest Santa Maria Refinery source. Other residential areas are 2,800 feet (853 meters) to the north and 2,900 feet (884 meters) to the east of the refinery. No non-residential sensitive receptors are located within 1 mile (1,600 meters) of the Santa Maria Refinery.

4.3.3 Regulatory Setting

4.3.3.1 Criteria Air Pollutants

Regulation of air pollution is achieved at the federal and state levels through both NAAQS and CAAQS and emission limits for individual sources of air pollutants. As required by the federal Clean Air Act (CAA), the USEPA has identified criteria pollutants and has established NAAQS to protect public health and welfare. NAAQS have been established for ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. To protect human health and the environment, the USEPA has set "primary" and "secondary" maximum ambient concentration thresholds for each of the criteria pollutants. Primary standards were set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals suffering from chronic lung conditions such as asthma and emphysema. Secondary standards were set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings. In urban settings, the primary standards are the most applicable.

California has adopted state ambient air quality standards for most of the criteria air pollutants and a few others. Table 4.3-4 lists both sets of ambient air quality standards (i.e., national and state) and the Bay Area Air Basin's attainment status for each standard. In addition to the federal criteria pollutants, California has also established state ambient air quality standards for sulfates (SO_4), hydrogen sulfide (H_2S), vinyl chloride (C_2H_3Cl) and visibility reducing particles, although only hydrogen sulfide is included in Table 4.3-4 as the others overlap to some extent with the other standards and ambient data for vinyl chloride and sulfates are limited.

As shown in Table 4.3-4, the Bay Area is currently classified as nonattainment for the 1-hour state ozone standard as well as for the federal and state 8-hour standards. Additionally, the Bay Area is classified as nonattainment for the state 24-hour and annual arithmetic mean PM_{10} standards as well as the state annual arithmetic mean and the national 24-hour $PM_{2.5}$ standards. The Bay Area is unclassified or classified as attainment for all other pollutants standards (USEPA 2021).

Attainment status for San Luis Obispo County against state and federal standards is summarized in Table 4.3-5. San Luis Obispo County is classified as nonattainment for ozone 1-hour state standards, 8-hour state and federal standards, and PM_{10} 24-hour and annual state standards (USEPA 2021).

Table 4.3-4. State and Federal Ambient Air Quality Standards and Bay Area Air Basin Attainment Status

Pollutant	Averaging Time	State (CAAQS[a])		Federal (NAAQS[b])	
		Standard	Attainment Status	Standard	Attainment Status
Ozone	1-hour	0.09 ppm	N	NA	see note[c]
	8-hour	0.070 ppm	N	0.070 ppm[d]	N[e]
Carbon Monoxide (CO)	1-hour	20 ppm	A	35 ppm	A
	8-hour	9 ppm	A	9 ppm	A
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm	A	0.100 ppm	A[f]
	Annual	0.030 ppm	U	0.053 ppm	A
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm	A	0.075 ppm	U/A[g]
	24-hour	0.04 ppm	A	0.14 ppm	U/A[g]
	Annual	NA	NA	0.03 ppm	U/A[g]
Particulate Matter (PM_{10})	24-hour	50 µg/m^3	N	150 µg/m^3	U
	Annual [H]	20 µg/m^3	N[i]	NA	NA
Fine Particulate Matter ($PM_{2.5}$)	24-hour	NA	NA	35 µg/m^3	N
	Annual	12 µg/m^3	N[i]	12 µg/m^3	U/A
Sulfates	24-hour	25 µg/m^3	A	NA	NA
Lead (Pb)	30-day	1.5 µg/m^3	A	NA	A
	Cal. Quarter	NA	NA	1.5 µg/m^3	A
	Rolling 3-month average	NA	NA	0.15	U[j]
Hydrogen Sulfide	1-hour	0.03 ppm	U	NA	NA
Visibility-Reducing Particles	8-hour	see note[k]	U	NA	NA

Source: BAAQMD 2017a; USEPA 2021

Notes: µg/m^3 = micrograms per cubic meter
A = Attainment
CAAQS = California Ambient Air Quality Standards
N = Non-attainment
NA = Not Applicable, no applicable standard
NAAQS = National Ambient Air Quality Standards
ppm = parts per million
U = Unclassified

a. CAAQS = California ambient air quality standards. CAAQS for ozone, CO (except Lake Tahoe), SO2 (1-hour and 24-hour), NO2, PM, and visibility reducing particles are values that are not to be exceeded. All other state standards shown are values not to be equaled or exceeded.

b. NAAQS = national ambient air quality standards. NAAQS, other than ozone and particulates, and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The 8-hour ozone standard is attained when the 3-year average of the fourth highest daily concentration is 0.070 ppm or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than the standard. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of the 98th percentile is less than the standard.

c. The USEPA revoked the national 1-hour ozone standard on June 15, 2005.

d. This federal 8-hour ozone standard was approved by the USEPA in October 2015 and became effective on December 28, 2015.

e. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. An area would meet the standard if the fourth highest maximum daily 8-hour ozone concentration per year, averaged over 3 years, is equal to or less than 0.070 ppm. The USEPA made recommendations on attainment designations for California by October 1, 2016, and issued final designations on June 4, 2018, classifying the San Francisco Bay Area Air Basin as being in Nonattainment (*Federal Register* 2018a). Nonattainment areas would have until 2020 to 2037 to meet the health standard, with attainment dates varying based on ozone level in the area.

f. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

g. On June 2, 2010, the USEPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO_2 NAAQS, however, must continue to be used until 1 year following the USEPA's initial designations of the new 1-hour SO_2 NAAQS. The USEPA classified the San Francisco Bay Area Air Basin as being in Attainment/Unclassifiable in January 2018 (*Federal Register* 2018b).

h. State standard = annual geometric mean

i. In June 2002, the CARB established new annual standards for $PM_{2.5}$ and PM_{10}.

j. National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.

k. Statewide visibility reducing particle standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Table 4.3-5. San Luis Obispo County Ambient Air Quality Standards Attainment Status

Pollutant (Averaging Time)	Attainment Status	
	State	Federal
O_3 (1-hour)	Nonattainment	--
O_3 (8-hour)	Nonattainment	Nonattainment (marginal) (eastern portion of County)
$PM_{2.5}$ (24-hour)	N/A	Attainment/Unclassifiable
$PM_{2.5}$ (annual)	Attainment	Attainment/Unclassifiable
PM_{10} (24-hour)	Nonattainment	Attainment/Unclassifiable
PM_{10} (annual)	Nonattainment	--
NO_2 (1-hour)	Attainment	Attainment/Unclassifiable
NO_2 (annual)	Attainment	--
SO_2 (1-hour)	Attainment	Attainment/Unclassifiable
SO_2 (24-hour)	Attainment	--
CO (1-hour)	Attainment	Attainment/Unclassifiable
CO (8-hour)	Attainment	Attainment/Unclassifiable
Lead (30-days)	Attainment	--
Lead (quarterly)	--	--
Lead (3-month rolling)	--	Attainment/Unclassifiable
H_2S (1-hour)	Attainment	--
Sulfates (24-hour)	Attainment	--

Source: USEPA 2021

4.3.3.2 Toxic Air Contaminants

The Air Toxics “Hot Spots” Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from TAC sources but does not directly regulate TAC emissions. Under this act, actual (historic) TAC emissions from individual facilities are quantified and prioritized using a scoring system. “High priority” facilities that could pose a risk to the public are required to perform a health risk assessment (HRA) and, if District-specific risk thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings. Depending on the risk levels, TAC-emitting facilities are required to implement varying levels of risk reduction measures (e.g., emissions controls). The BAAQMD implements AB 2588 in its jurisdiction, and is responsible for prioritizing facilities that emit TACs, reviewing HRAs, and implementing risk reduction measures. Pursuant to the requirements of AB 2588, the BAAQMD publishes an air toxics emissions inventory that details the TAC emissions of affected facilities throughout the District. Under the regulation, facilities must update their TAC inventories on a quadrennial basis.

4.3.3.3 Federal

The USEPA is responsible for implementing the programs established under the federal CAA, such as establishing and reviewing the NAAQS, determining regions’ attainment status based on monitoring data, and assessing the adequacy of State Implementation Plans. However, the USEPA has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

One of those permit programs is the Prevention of Significant Deterioration (PSD). The Project does not qualify as a "PSD project," which is defined in BAAQMD Rule 2-2-224 as a combination of new and modified sources that qualify as a new Major PSD Facility, or that result in a "significant" emissions increase at an existing facility. This analysis is limited to federal attainment pollutants. Additionally, in accordance with BAAQMD Regulation 2-2-610, "cargo carriers" are not subject to PSD to offset or best available control technology (BACT) requirements. This includes emissions from Ocean Going Vessels (OGVs) loading or unloading cargo and rail unloading cargo associated with a project. As a result, cargo carrier sources are not required to be included in the PSD analysis, except for assessing ambient air quality impacts where necessary. A PSD analysis is presented in the BAAQMD permit application for this Project, which is currently under review by the District.

4.3.3.4 State of California

The CARB is responsible for establishing and reviewing the CAAQS, compiling the California State Implementation Plan with input from the 35 air districts, and securing approval of that plan from the USEPA. The CARB conducts research and planning and identifies TACs. The CARB also regulates mobile sources of emissions in California, such as construction equipment, portable equipment, trucks, and automobiles, and oversees the activities of California's 35 air districts, which are organized at the county or regional level. County or regional APCDs and AQMDs are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas and for preparing and implementing air quality management plans[25] that are required under the federal CAA and California CAA.

4.3.3.5 Regional and Local

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with jurisdiction over the nine-county region located in the SFBAAB, which includes Contra Costa County. The ABAG/MTC, county transportation agencies, cities and counties, and various non-governmental organizations also join in the efforts to improve air quality through a variety of programs. These programs include the adoption of rules, regulations, and policies, as well as implementation of extensive education and public outreach programs. The BAAQMD is also responsible for attaining and/or maintaining air quality in the SFBAAB within federal and state air quality standards. Specifically, the BAAQMD has the responsibility to monitor ambient air pollutant levels throughout the Bay Area and to develop and implement control strategies to attain the applicable federal and state air quality standards.

The BAAQMD regulates stationary sources through the issuance of permits. Any person or facility that puts in place, builds, erects, installs, modifies, modernizes, alters or replaces any article, machine, equipment or other contrivance, the use of which may cause, reduce or control the emission of air contaminants, shall first secure written authorization from the BAAQMD in the form of an Authority to Construct, unless the source is specifically excluded or exempt from permit requirements. The BAAQMD's permitting process is a preconstruction review and approval process. The BAAQMD's review is conducted after the equipment is designed, but before it is purchased and installed. This is because it is less costly and more efficient to correct a non-complying design at the vendor level than to retrofit or replace non-complying equipment that has already been bought and installed. The preconstruction review for new and modified sources applies to both stationary and portable sources of emissions that do not qualify for a permit exemption. Following issuance of an Authority to Construct, the equipment can be installed and tested, and if performance specifications are met, the District would issue a Permit to Operate.

In addition, Title V of the 1990 CAA Amendments requires all major sources and some minor sources of criteria pollutants to obtain a federal operating permit, where the USEPA has delegated permitting authority to state and local agencies. A Title V permit grants a source permission to operate under the

[25] Also referred to as Attainment Plans or Clean Air Plans, particularly for ozone and PM_{10}/$PM_{2.5}$ nonattainment areas

CAA. The permit includes all air pollution requirements that apply to the source, including emissions limits and monitoring, recordkeeping, and reporting requirements. It also requires that the source report its compliance status with respect to permit conditions to the permitting authority, such as the BAAQMD. Under Title V of the federal CAA, any source that emits or has the potential to emit 100 tons per year or more of any criteria air pollutant is a major source and must obtain a Title V operating permit. In nonattainment areas, the major source thresholds are lower for nonattainment pollutants (e.g., NOx and volatile organic compound [VOC] for ozone) depending on the nonattainment classification (i.e., Serious, Severe, or Extreme). Title V permits in the Bay Area are issued by the BAAQMD. The Refinery was issued a Title V Operating Permit (#A0016) on December 1, 2003, which was renewed in January 2018 and was last revised in December 2018.

In the Bay Area, Title V requirements are implemented by Regulation 2, Rule 6 of the BAAQMD Rules and Regulations. Phillips 66 is subject to the Operating Permit requirements of Title V of the federal CAA, and BAAQMD Regulation 2, Rule 6, Major Facility Review, because it is a major facility as defined by BAAQMD Regulation 2-6-212. It is a major facility because it has the "potential to emit," more than 100 tons per year of a regulated air pollutant, as defined by BAAQMD Regulation 2-6-218. Major Facility Operating permits (Title V permits) must meet specifications contained in 40 Code of Federal Regulations (CFR) Part 70 as contained in BAAQMD Regulation 2, Rule 6.

Phillips 66 has submitted an application to the BAAQMD for an Authority to Construct and update to the Major Facility Review (Title V) Permit for the Project.

California Environmental Quality Act (CEQA) Guidelines

In December 1999, the BAAQMD adopted its original *CEQA Guidelines – Assessing the Air Quality Impacts of Projects and Plans*, as a guidance document to provide lead government agencies, consultants, and project proponents with uniform procedures for assessing air quality impacts and preparing the air quality sections of environmental documents for projects subject to CEQA. The BAAQMD CEQA Guidelines is an advisory document and local jurisdictions are not required to use the methodology outlined therein. The document describes the criteria that the BAAQMD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for use in determining whether projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts.

The BAAQMD developed quantitative thresholds of significance for its updated CEQA Air Quality Guidelines in 2010 (BAAQMD 2010, 2011). The BAAQMD published its latest (as of April 2021) version of its CEQA Guidelines (BAAQMD CEQA Guidelines) in May 2017 (BAAQMD 2017b). The 2017 BAAQMD CEQA Guidelines provide BAAQMD-recommended procedures for evaluating potential air quality impacts during the environmental review process consistent with CEQA requirements.

The guidelines specify recommended thresholds of significance for construction and operational criteria air pollutants and precursor emissions, GHG emissions, and risks and hazards associated with TACs from an individual project and cumulative impact. These thresholds are outlined below.

The operational-related thresholds for Climate Action Plans (CAPs) are maximum annual emissions of 10 tons per year for ROG, NO_x, and $PM_{2.5}$ and 15 tons per year for PM_{10}. The average daily thresholds are 54 pounds per day for ROG, NO_x, and $PM_{2.5}$ and 82 pounds per day for PM_{10}. The average daily thresholds apply to both operational-related emissions and construction-related emissions, except that the particulate matter thresholds apply only to engine exhaust emissions for construction equipment (i.e., fugitive dust excluded). The BAAQMD also lists Construction BMPs to control construction PM_{10}/$PM_{2.5}$ fugitive dust emissions as a threshold of significance. The guidelines also specify thresholds for carbon monoxide 9.0 ppm as an 8-hour average concentration and 20.0 ppm as a 1-hour average concentration.

Project and cumulative health risk impact thresholds are specified below:

- Project Impact Thresholds:
  - An excess lifetime cancer risk level of more than 10 in 1 million;
  - A noncancer chronic hazard index greater than 1.0;
  - An incremental increase in the annual average $PM_{2.5}$ concentration of greater than 0.3 µg/m^3.
- Cumulative Risk Thresholds:
  - An excess lifetime cancer risk level of more than 100 in 1 million;
  - A noncancer chronic hazard index greater than 10.0; and
  - An annual average $PM_{2.5}$ concentration of greater than 0.8 µg/m^3.

2017 Bay Area Air Quality Management District Clean Air Plan

Air quality plans developed to meet federal requirements are referred to as State Implementation Plans. The federal CAA and the California CAA require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM_{10} standard). The SFBAAB is designated nonattainment for both the 1- and 8-hour state ozone standards. In addition, emissions of ozone precursors in the air basin contribute to air quality problems in neighboring air basins. Under these circumstances, state law requires the Clean Air Plan to include all feasible measures to reduce emissions of ozone precursors and to reduce the transport of ozone precursors to neighboring air basins. At a public hearing in April 2017, the BAAQMD Board of Directors adopted the Final 2017 Clean Air Plan, whose primary goals are to protect public health and to protect the climate (BAAQMD 2017c). The plan includes a wide range of proposed control measures to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent GHGs. The Final 2017 Clean Air Plan updates the Bay Area 2010 Clean Air Plan and complies with state air quality planning requirements as codified in the California Health and Safety Code.

The Final 2017 Clean Air Plan contains 85 measures to address reduction of several pollutants: ozone precursors, particulate matter, air toxics, and GHGs. Other measures focus on a single type of pollutant, such as specific GHGs like methane (CH_4) and black carbon that consists of harmful fine particles that affect public health. The control measures are categorized based on the economic sector framework including stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, and water measures.

The Final 2017 Clean Air Plan also includes a Refinery Emissions Reduction Strategy, consisting of at least 12 control measures designed to reduce refinery emissions of particulate matter, ozone precursors, TACs and GHGs. Among the components of this strategy is a reduction in criteria air pollutant emissions by 20 percent from oil refineries, as well as a 20 percent reduction in health risk to local communities.

The Refinery Emissions Reduction Strategy builds upon previous refinery regulations and aims to develop new local rules to reduce refinery emissions as delineated in their plan. As of the Final 2017 Clean Air Plan's adoption in April 2017, the refinery Emissions Reduction Strategy included the adoption of four rules that would apply to Rodeo Refinery operations:

- Equipment Leaks (Regulation 8, Rule 18),
- Cooling Towers (Regulation 11, Rule 10),
- Petroleum Refining Emissions Tracking rule (Regulation 12, Rule 15), and
- Petroleum Coke Calcining Operations rule (Regulation 9, Rule 14).

The Final 2017 Clean Air Plan also references need for renewable fuels, and states the following:

> *Oil Companies Will Transform to Clean Energy Companies by 2050. Bay Area industries will need to be powered by renewable electricity wherever feasible with renewable fuels making up the difference, the carbon-intensity of products manufactured in the region will need to be greatly reduced, and a significant percentage of the light-duty vehicle fleet will be hybrid electric or fully battery-powered. In response to decreasing demand for gasoline and diesel, oil companies will need to reorient their focus to the production of renewable energy and biofuels, while perhaps continuing to provide hard-to-replace or specialty fuels (e.g., jet fuel)* (BAAQMD 2017c, p. 10.)

Air Toxics Program

The BAAQMD's Air Toxics Program integrates federal and state air toxics mandates with local goals that have been established by the BAAQMD's Board of Directors. The program consists of several elements that are designed to identify and reduce public exposure to TACs. Under the preconstruction review of new and modified sources program, proposed projects are reviewed for potential health impacts, with the requirement that significant new/modified sources use the best available control technology for toxics to minimize TAC emissions. All applications for new or modified permits are reviewed for air toxics impacts, in accordance with the BAAQMD's Risk Management Policy and by Regulation 2, Rule 5: *New Source Review of Toxic Air Contaminants*.

In addition, Regulation 11, Rule 18: *Reduction of Risk from Air Toxic Emissions at Existing Facilities* addresses actual emissions from operational facilities. District staff would conduct site-specific screening analyses for all facilities that report TAC emissions, and calculate health prioritization scores based on the amount of TACs emitted, the degree of toxicity (potency) of the pollutants emitted, and the proximity of these facilities to local communities (receptors). For facilities found to have priority scores above a threshold value, the District would conduct HRAs. Based on the HRA results, facilities found to have a potential health risk above the Risk Action Level would be required to reduce their risk below the Risk Action Level, or install (retrofit) best available control technology for toxics on all significant (risk-driving) sources of toxic emissions. This regulation is applicable to the Rodeo Refinery and to date, Phillips 66 has provided all information requested by BAAQMD.

Contra Costa County General Plan

As of March 2021, Contra Costa County is in the process of updating its general plan, referred to as *Envision Contra Costa 2040*. The Conservation Element of the 2010 Contra Costa County General Plan contains an air quality resources discussion (Section 8.14) that identifies general goals and policies designed to address air pollution. While the goals and policies apply to development projects throughout the unincorporated county, the majority of them are not directly applicable to the Project because they tend to focus on land use development, improvements to the transportation system, reducing long-distance commuting, encouraging and supporting non-auto transportation, and reducing future land use conflicts related to air pollution. However, policies that are directly applicable to the CEQA review of projects are summarized as follows:

- Mitigation measures are to be imposed when there is a finding that air quality would be significantly affected; and
- Proposed projects should be reviewed for potential to generate hazardous air pollutants.

Contra Costa County Climate Action Plan

In December 2015, the County Department of Conservation and Development completed and released a CAP (Contra Costa County 2015). The CAP identifies specific measures on how the county can achieve a GHG reduction target of 15 percent below baseline levels by the year 2020. The CAP specified GHG

reduction goals associated with energy efficiency, renewable energy, land use and transportation, solid waste, and water conservation. However, planned activities delineated in the CAP are generally directed to residential, commercial, or industrial land use development projects and would not apply to process changes at an industrial facility.

The County is in the process of updating the 2015 CAP with the 2020 CAP. In December 2020, the County issued a progress report that provided information on actions the County has taken to advance the goals of the 2015 CAP. However, due to the COVID-19 pandemic, the development of the 2020 CAP has been delayed.

San Luis Obispo County Air Pollution Control District's CEQA Air Quality Handbook

In 2012, San Luis Obispo County APCD released its CEQA Air Quality Handbook which describes the criteria used when evaluating new developments to determine when an air quality analysis is necessary, the type of analysis that should be performed, the significance of the impacts predicted by the analysis, and the mitigation measures to reduce overall air quality impacts.

In Section 2 of the Handbook, guidance is available for assessing construction emissions and mitigating construction related impacts. Construction emissions must be calculated for all development projects likely to exceed the construction emissions threshold, or if the project is subject to the special conditions defined in Section 2.1.1. Once the emissions have been calculated, they must be compared to the APCD construction phase significance thresholds (San Luis Obispo County APCD 2012). In November 2017, San Luis Obispo County APCD amended the thresholds in a memorandum appended to their handbook. These thresholds are used to evaluate the demolition activity at the Santa Maria Site and are describe in more detail in Section 4.3.3, *Significance Criteria*, of this document.

4.3.4 Project Setting

As discussed in Chapter 3, *Project Description*, the Rodeo Refinery consists of process, storage, and support facilities that produce a variety of petroleum-based products (mainly fuels) and by-products from crude oil and other petroleum-based feedstocks. Under existing conditions, semi-refined liquids are delivered to the Rodeo Refinery via pipeline from the Santa Maria Site in San Luis Obispo, California. Crude oil and gas oil are delivered to the Rodeo Refinery via tanker vessels from domestic and foreign sources. Other feedstocks are required in the refining process; some are brought by tanker vessel and by truck, while others, such as hydrogen, are produced by a third-party facility adjacent to the refinery. Tanker and barge vessels dock at the Rodeo Refinery Marine Terminal, located at the northern tip of the Rodeo Site, which is connected to the Rodeo Refinery by pipelines. Crude oil and feedstocks are stored in tanks within the refinery until they are consumed in the refining process. The refinery also produces steam, fuel gas, and electricity for use in the refining process, and purchases electricity, water, and natural gas.

4.3.4.1 Rodeo Refinery

The Rodeo Refinery includes a Cogeneration Steam Power Plant containing gas turbines that use heat recovery steam generators (HRSGs) to generate process steam and up to 50 MW of electricity for refinery use, a butane storage and railcar loading facility near the Marine Terminal, a wastewater treatment facility (U100), a vapor recovery system, a hydrogen generator, and the Carbon Plant Site (approximately 1.5 miles south of the refinery in Franklin Canyon) that upgrades the petroleum coke by-product. The refinery's products are transported out of the refinery by vessel, pipeline, truck, and rail. Liquid products (principally, gasoline and diesel fuel) are loaded onto tanker or barge vessels at the Marine Terminal via pipeline from on-shore storage tanks. Butane is loaded onto railcars for shipment to blending facilities and other customers. In addition, operations of adjacent third-party plant operator Air Liquide, which supplies hydrogen gas (H_2) for the refinery operations, may indirectly increase due to the Project and therefore, its emissions are included in the evaluation against significance criteria. However,

no modification will occur at Air Liquide as a result of the Project. Air Liquide is not increasing its hydrogen production capacity as a result of the Project.

4.3.4.2 CEQA Baseline Emissions

The CEQA baseline for this analysis is represented by year 2019, except for marine transportation, for which the baseline is an average of the years 2017–2019 (see Chapter 3, *Project Description*, for a detailed explanation of the CEQA baseline). Annual and daily average baseline emissions at the Rodeo site (including the Rodeo Refinery and the Carbon Plant) are summarized in Table 4.3-6 and Table 4.3-7, respectively. Emissions from stationary sources at the Rodeo Refinery, Air Liquide H_2 Plant and Carbon Plant for 2019 were provided by Phillips 66. Emissions from ocean-going vessels, like tankers and ATBs, assist tugs and pull tugs moving tank barges visiting the Marine Terminal were calculated based on the 3-year baseline average of 2017 through 2019 data provided by Phillips 66. Vessel emissions include hoteling at the wharf or at anchor, and vessel maneuvering and transit between the wharf or anchorage area out to the Pilot Buoy located approximately 9 nautical miles (7.8 statute miles) west of the Golden Gate. Emissions from heavy duty truck trips moving feedstocks and product to and from the Rodeo Facility were calculated based on truck trip counts for 2019 provided by Phillips 66. Emissions from rail locomotives moving railcars to and from the butane loading rack at the Rodeo Refinery and moving pet coke to and from the Carbon Plant were calculated based on railcar movement data for 2019 provided by Phillips 66. Rail emissions include all travel within the BAAQMD boundary and within other relevant Air Districts in California. Truck emissions include all travel within the BAAQMD boundaries and within California state boundary.[26] Details of the data and assumptions used to calculate emissions are provided in Section 4.3.6, *Discussion of No Air Quality Impacts*, and Section 4.3.7, *Direct and Indirect Impacts of the Proposed Project,* below and Attachments A and B of the Air Quality Technical Report provided in Appendix B (Ramboll 2021).

Table 4.3-6. Annual Baseline Emissions: Rodeo Refinery (2019)

Source	Emissions (tons/year)					
	VOC	**NO_x**	**PM_{10}[a]**	**$PM_{2.5}$[a]**	**SO_2**	**CO**
Ocean-going Vessels and Harbor Craft[b]	9	147	4	4	7	45
Trucks	0.31	10	3	1	0.03	1
Rodeo Site Stationary Sources	119	221	73	71	348	93
Rodeo Site Rail Operations	0.06	1.39	0.04	0.03	0.02	0.39
Carbon Plant Site Stationary Sources	0	359	21	19	1,080	11
Carbon Plant Site Rail Operations	0.01	0.29	0.01	0.01	0.00	0.08
Total Operational Rodeo Refinery	**128**	**739**	**102**	**95**	**1,435**	**151**
Air Liquide H_2 Plant	1	17	4	4	0	1
Total Operational with Air Liquide	**129**	**756**	**105**	**98**	**1,435**	**152**

a. PM_{10} and $PM_{2.5}$ emissions include exhaust and fugitive dust sources (road dust, tire and brake wear)
b. Ocean-going vessels and harbor craft emissions are based on a 3-year baseline average (2017–2019)

[26] Truck emissions were calculated within BAAQMD boundaries for purposes of criteria pollutant emissions evaluation and statewide total emissions were estimated for purposes of greenhouse gas analysis (see Section 2.8). Truck emissions for air districts and counties outside of BAAQMD were not estimated due to net truck traffic between Project and baseline levels decreasing significantly, and specific material truck trips increases occurring within the BAAQMD only.

Table 4.3-7. Average Daily Baseline Emissions: Rodeo Refinery (2019)

Source	Emissions (lbs/day)					
	VOC	**NO_x**	**PM_{10}[a]**	**$PM_{2.5}$[a]**	**SO_2**	**CO**
Ocean-going Vessels and Harbor Craft[b]	50	806	22	21	40	249
Trucks	2	54	17	4	0.2	7
Rodeo Site Stationary Sources	650	1,212	402	389	1,908	509
Rodeo Site Rail Operations	0.31	7.60	0.19	0.18	0.13	2.14
Carbon Plant Site Stationary Sources	2	1,967	116	106	5,918	60
Carbon Plant Site Rail Operations	0.07	1.58	0.04	0.03	0.02	0.44
Total Operational Rodeo Refinery	**703**	**4,048**	**558**	**520**	**7,865**	**828**
Air Liquide H_2 Plant	6	92	20	19	0	5
Total Operational with Air Liquide	**709**	**4,140**	**577**	**539**	**7,865**	**833**

a. PM_{10} and $PM_{2.5}$ emissions include exhaust and fugitive dust sources (road dust, tire and brake wear)

b. Ocean-going vessels and harbor craft emissions are based on a 3-year baseline average (2017–2019)

4.3.4.3 Santa Maria Site and Pipeline Sites

As mentioned previously, the Project includes the shutdown of the Santa Maria Site in San Luis Obispo, California, and the Pipeline Sites connecting the Santa Maria Site to the Rodeo Refinery. The Santa Maria Site operations include rail operations, trucking and stationary sources operations at the refinery. The Pipeline Sites operations include pumps, tanks, fugitive components and boilers located at the various pumping stations along the connecting pipeline. Upon completion of demolition activities, emissions at the Santa Maria Site would be eliminated resulting in negative criteria pollutant impacts related to that site. Similarly, upon decommissioning of the Pipeline Sites, emissions from those operations would cease. Nevertheless, existing conditions during the baseline were reviewed and are included for informational purposes.

Annual and daily average emissions at the Santa Maria Site for the Project baseline year (2019) are summarized in Table 4.3-8 and Table 4.3-9, respectively. Emissions from stationary sources at the Santa Maria Refinery and pump station and pipeline for 2019 were provided by Phillips 66. Emissions from rail locomotives moving railcars to and from the petroleum coke loading rack at the Santa Maria Refinery were calculated based on railcar movement data for 2019 provided by Phillips 66. Rail emissions include all travel within the San Luis Obispo County APCD boundary and within other relevant Air Districts in California. Truck emissions include all travel within the San Luis Obispo County APCD boundaries.[27] Details of the data and assumptions used to calculate emissions are provided in Section 4.3.6, *Discussion of No Air Quality Impacts*, and Section 4.3.7, *Direct and Indirect Impacts of the Proposed Project* below and Attachments A and B of the Air Quality Technical Report provided in Appendix B (Ramboll 2021).

[27] Truck emissions from Santa Maria Site baseline operations were estimated within SLOCAPCD boundaries for informational purposes. Project emissions for Santa Maria Site trucks would be zero, hence, emissions related to travel across other air districts and counties outside of SLOCAPCD were not estimated.

Table 4.3-8. Annual Baseline Emissions: Santa Maria and Pipeline Sites (2019)

Source	Emissions (tons/yr)					
	VOC	**NO_x**	**PM_{10}[a]**	**$PM_{2.5}$[a]**	**SO_2**	**CO**
Santa Maria Rail Operations	0.004	0.068	0.001	0.001	0.001	0.024
Santa Maria Trucks	0.25	8	3	0.59	0.03	0.93
Santa Maria Stationary Sources	28	51	24	24	80	6
Pipeline Sites	15	4	1	1	2	27
Total Operational	**43**	**64**	**28**	**26**	**82**	**34**

Notes:

[a] PM_{10} and $PM_{2.5}$ emissions include exhaust and fugitive dust sources (road dust, tire and brake wear).

Table 4.3-9. Average Daily Baseline Emissions: Santa Maria and Pipeline Sites (2019)

Source	Emissions (lbs/day)					
	VOC	**NO_x**	**PM_{10}[a]**	**$PM_{2.5}$[a]**	**SO_2**	**CO**
Santa Maria Rail Operations	0.02	0.37	0.0074	0.01	0.005	0.13
Santa Maria Trucks	1	45	16	3	0.15	5
Santa Maria Stationary Sources	151	280	133	133	440	33
Pipeline Sites	84	24	7	7	10	148
Total Operational	**237**	**349**	**156**	**143**	**450**	**186**

Notes:

[a] PM_{10} and $PM_{2.5}$ emissions include exhaust and fugitive dust sources (road dust, tire and brake wear).

4.3.5 Significance Criteria

Based on CEQA Guidelines Appendix G (2019), the significance criteria established by the applicable Air Quality Management District (AQMD) or APCD may be relied upon to make the following determinations: a project would cause adverse impacts to air quality if it would:

a. Conflict with or obstruct implementation of the applicable air quality plan;

b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard;

c. Expose sensitive receptors to substantial pollutant concentrations; or

d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

In this analysis, components of the Project are evaluated against the significance criteria of various air districts, including the BAAQMD and San Luis Obispo County APCD, to assess air quality related impacts of the Project construction and operational activities. For the Rodeo Site and Carbon Plant Site (collectively, Rodeo Refinery), impacts of construction activities at Rodeo Site, demolition at the Carbon Plant Site and operations at the Rodeo Refinery are evaluated against thresholds defined by the BAAQMD. For the construction activities (or specifically, demolition) at the Santa Maria Site, air quality impacts of temporary construction are evaluated against the thresholds established by San Luis Obispo County APCD. Net operational emissions at the Santa Maria Site and Pipeline Sites would be negative

due to cessation of those activities, and therefore, related operational significance criteria are not discussed here.

4.3.5.1 Rodeo Refinery

This analysis uses the thresholds and methodologies from the BAAQMD's 2017 CEQA Air Quality Guidelines to evaluate the potential impacts of construction and operation of the Project. Applying the 2017 thresholds of significance, the Project would have a significant project-level air quality impact if it would:

- Result in average daily construction equipment engine exhaust emissions of 54 pounds per day of ROG, NO_x, or $PM_{2.5}$ or 82 pounds per day of PM_{10};
- Result in average daily operational emissions of 54 pounds per day of ROG, NO_x, or $PM_{2.5}$ or 82 pounds per day of PM_{10}; or result in maximum annual emissions of 10 tons per year of ROG, NO_x, or $PM_{2.5}$ or 15 tons per year of PM_{10};
- Expose persons by siting a new source or a new sensitive receptor to substantial levels of TACs resulting in (a) a cancer risk level greater than 10 in one million, (b) a non-cancer risk (chronic or acute) hazard index greater than 1.0, or (c) an increase of annual average $PM_{2.5}$ of greater than 0.3 microgram per cubic meter. For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, and medical centers within 1,000 feet of a new source of TACs; or
- Frequently and for a substantial duration, create or expose sensitive receptors to substantial objectionable odors affecting a substantial number of people.[28]

The Project would result in a significant cumulative health risk impact if it would:

- Expose persons, by siting a new source or a new sensitive receptor, to substantial levels of TACs during either construction or operation resulting in (a) a cancer risk level greater than 100 in a million, (b) a non-cancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 microgram per cubic meter.

The Project would result in a significant cumulative increase in criteria pollutant or precursor emissions if it would:

- Result in an emissions increase for ROG, NO_x, PM_{10}, or $PM_{2.5}$ that exceeds the BAAQMD's project-specific thresholds. Thus, if the Project would not result in a significant impact individually for ROG, NO_x, PM_{10}, and $PM_{2.5}$, its contribution to cumulative impacts is considered less than significant.

4.3.5.2 Santa Maria and Pipeline Sites

The threshold criteria established by the San Luis Obispo County APCD to determine the significance and appropriate mitigation level for a project's short-term construction emissions are shown below (San Luis Obispo County APCD 2012):

- **Daily**
  - Exceedance of the 137 pounds per day threshold for ROG and NOx combined ("ROG+NO_x") requires Standard Mitigation Measures. For construction projects expected to be completed in less than one quarter, exceedance of the 7 pounds per day threshold for exhaust diesel PM_{10} (DPM) requires Standard Mitigation Measures.

[28] Subject to verification by a District Inspector

- **Quarterly—Tier 1**
  - Exceedance of the 2.5 tons per calendar quarter threshold for ROG+NO_x requires Standard Mitigation Measures and BACT for construction equipment. If implementation of the Standard Mitigation and BACT measures cannot bring the project below the threshold, offsite mitigation may be necessary if feasible mitigation are not implemented, or if no mitigation measures are feasible for the project.
  - For construction projects lasting more than one quarter, exceedance of the 0.13 tons per quarter of DPM threshold requires Standard Mitigation Measures, BACT for construction equipment; and,
  - For construction projects lasting more than one quarter, exceedance of the 2.5 tons per quarter of Fugitive Dust PM_{10} threshold requires dust Mitigation Measures and may require the implementation of a Construction Activity Management Plan.
- **Quarterly—Tier 2**
  - Exceedance of the 6.3 ton per quarter of ROG+NO_x threshold requires Standard Mitigation Measures, BACT, implementation of a Construction Activity Management Plan, and offsite mitigation; and
  - For construction projects lasting more than one quarter, exceedance of the 0.32 tons per quarter of DPM threshold requires Standard Mitigation Measures, BACT, implementation of a Construction Activity Management Plan, and offsite mitigation.

Significance criteria for other Air Districts are applied as applicable for the Pipeline Sites, particularly regarding the decommissioning of Pipeline Sites and for rail activity outside the SFBAAB across California. For more information on the thresholds used for rail activity, refer to Attachment A in Appendix B, *Air Quality and Greenhouse Gas Emissions Technical Data*. The following construction thresholds are used to evaluate emissions from decommissioning of Pipeline Sites in San Joaquin Valley APCD and Santa Barbara County APCD:

- **San Joaquin Valley APCD:** Projects would be in exceedance of construction thresholds if annual construction emissions would exceed the thresholds of 100 tons per year of CO, 10 tons per year of NO_x, 10 tons per year of ROG, 27 tons per year of SOx and 15 tons per year of PM_{10} (San Joaquin Valley APCD 2015).
- **Santa Barbara County APCD:** Projects would be in exceedance of construction thresholds if annual construction exhaust emissions would exceed the thresholds of 25 tons per year of reactive organic compounds and 25 tons per year of NO_x (Santa Barbara County APCD 2020).

4.3.6 CEQA Baseline

Baseline conditions reflect the 2019 operation and maintenance of the Rodeo Refinery and Santa Maria Site as petroleum refineries and associated facilities, including operation and maintenance activities. The baseline setting also includes the applicable regulatory framework to protect environmental resources, which are described above.

4.3.7 Approach to Analysis

As discussed previously, the analysis approach used in this document follows recommendations provided in the BAAQMD's 2017 CEQA Air Quality Guidelines. For further details of data, calculations, and assumptions used to determine Project-related emissions and associated public health risks that would be associated with the Project, refer to the Air Quality Technical Report (Ramboll 2021).

4.3.7.1 Construction Emissions Estimates

Construction of the Project would include the removal or repurposing of the existing refinery equipment as applicable, adding new equipment to the Rodeo Site, demolition of the Carbon Plant, decommissioning of Pipeline Sites and demolition of the Santa Maria Site.

Rodeo Refinery Construction and Demolition

The Project would involve construction and demolition activities at the Rodeo Refinery as described in Section 3.10, *Overall Project Construction/Demolition Phase*. All demolition and construction associated with the Rodeo Refinery would occur within the refinery boundary (except for one laydown area) and would be conducted in accordance with established procedures and BMPs and 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. Scrap metal would be hauled away to an offsite recycling facility.

Construction and demolition activities would involve diesel-powered heavy equipment such as loaders, earthmovers, cranes, and concrete trucks, and lighter-duty equipment such as welders and compressors, some of which would also be diesel-powered. The use of diesel-powered off-road construction equipment and on-road trucks would result in criteria pollutant emissions from engine exhaust, including DPM, during the construction period and fugitive particulate matter emissions from road dust and wind erosion from earth-moving activities. Fugitive particulate matter emissions from vehicle road dust are based on CARB's methodology, using a composite silt loading factor based on the vehicle miles traveled-weighted distribution of the road types (local, corridors, major and freeways) in the region[29] because the exact route of the vehicles beyond the I-80 freeway is unknown. San Pablo Avenue is the main roadway near the Project site accessed for construction traffic and is considered an arterial (i.e. major roadway) pursuant to the County's General Plan[30] and not a local street.

Construction would employ up to 500 workers at a time who would commute daily to and from the construction site mostly by means of private gasoline passenger vehicles; the construction workforce is expected to be drawn from the greater East Bay region, within a 1-hour commute distance. Hauling trucks trips would range from a daily minimum of 10 round trips and a daily maximum of 165 round trips during the construction period.

Emissions for Rodeo Site activities were estimated through a bottom-up approach using activity assumptions for expected construction equipment and vehicle trips provided by Phillips 66, combined with emission factors from the CARB's OFFROAD2017—ORION web database model (v1.0.1) used for construction equipment, and the CARB's Emission Factor Model version 2021 (EMFAC2021) for vehicle emission factors. The emission factors for construction equipment reflect a fleet mix of Tier 4 to the maximum extent practicable for pieces >50HP, with the remaining equipment representing Bay Area air district default distribution in OFFROAD2017. The hauling trucks reflect a fleet of vehicles model year 2014 and newer. The remaining vehicles (worker and service vendors) represent the Bay Area air district default distribution in EMFAC2021.

For characterizing the Carbon Plant demolition emissions, the California Emissions Estimator Model (CalEEMod), version 2016.3.2, was used to determine associated equipment for demolition of general heavy industrial land use of square footage equivalent to that of the Carbon Plant. The number of hauling truck trips expected for the Carbon Plant demolition was based on Project estimates and entered into the model to determine vehicle emission associated with the Carbon Plant demolition.

[29] Vehicle miles travelled road type distribution nearest city, Concord, CA, from the Federal Highway Administration for is used to estimate average road type distribution in lieu of unavailable road type distribution for Rodeo, CA.

[30] Figure 5-2 of the County's General Plan. Available at //www.contracosta.ca.gov/DocumentCenter/View/30915/Ch5-Transportation-and-Circulation-Element?bidId=

During construction, a period of increased vessel traffic related to the shutdown of the Pipeline Sites is expected, and therefore, concurrent emissions from incremental vessel traffic are counted toward the Rodeo Site construction total. Marine traffic emissions estimated are described in Operational Emissions Estimates subsection below.

Annual construction-related emissions that would result from the proposed construction and demolition activities at the Rodeo Site and demolition of the Carbon Plant Site are summarized in Section 4.3.6, *Discussion of No Air Quality Impacts*, and Section 4.3.7, *Direct and Indirect Impacts of the Proposed Project* below.

For purposes of determining emission factors and developing the analysis, construction at the Rodeo Site and demolition at the Carbon Plant was assumed to occur over a period of approximately 21 months starting from 2022 through 2024 across the various Project sites. However, an exact construction schedule for any of the construction elements is dependent on when applicable permits for the Project are obtained.

Santa Maria Site and Pipeline Sites

Decommissioning and demolition activities at the Santa Maria site would involve use of off-road construction equipment and on-road vehicles that produce criteria pollutant emissions, including DPM. Emissions from these activities were calculated using emission factors from CalEEMod, version 2016.3.2, and equipment activity estimates. For emission estimating purposes, demolition at the Santa Maria Site was assumed to occur over an approximately 1-year period for purposes of emissions calculations.

In addition, emissions from cleaning and removal from service of segments of pipeline (i.e., pigging/pipeline blowdowns) and associated tanks connecting the Santa Maria Site and the Rodeo Refinery (i.e., Pipeline Sites) are included in the construction emissions compared against San Luis Obispo County APCD, Santa Barbara County APCD, and San Joaquin Valley APCD significant thresholds, shown in Section 4.3.6, *Discussion of No Air Quality Impacts*, and Section 4.3.7, *Direct and Indirect Impacts of the Proposed Project* below.

4.3.7.2 Operational Emissions Estimates

Existing operations at the Rodeo Site include refinery operations, trucking of materials into the refinery, rail shipments of products (butane) and shipping of feedstocks and products through the Marine Terminal. Operational emissions from the Project would occur at the Rodeo Site grounds and its Marine Terminal and along rail lines, roadways, and ship traffic lanes leading to and from the Rodeo Site. Existing operations at the Carbon Plant generate criteria pollutant emissions from stationary sources, rail operations and trucking, including DPM. Similarly, the Santa Maria Site baseline includes emissions from rail operations, trucking and refinery operations. Connecting the Santa Maria Site and the Rodeo Site is a pipeline and a series of midstream pumping stations (i.e., the Pipeline Sites) that include combustion engines, tanks and fugitive components. Upon completion of demolition activities, emissions at the Carbon Plant Site, Santa Maria Site and the Pipeline Sites would be eliminated resulting in negative net emissions (against the baseline) related to these specific Project Sites. For purposes of the analysis emissions were calculated assuming Project operations would commence in 2024. The following methodologies were applied to estimate emissions for operational sources.

Stationary Sources

Emissions for existing stationary sources during 2019 (baseline) were developed by Phillips 66 for their annual permit requirements. Changes to individual units and processes are summarized in Chapter 3, *Project Description*. New emissions sources would include a renewable feedstock PTU. The PTU process uses reactors, vessels, tanks and other equipment for polyethylene removal, degumming, and adsorption processes. Some of this equipment operates under vacuum and others at atmospheric pressure. Each of

the three PTU trains has a closed loop system to collect, control and discharge all vapors and gases from the process.

The PTU includes a FOG recovery process that consists of tanks, vessels, centrifuges, and evaporator units to remove organic material from process wastewater before treatment at the existing facility wastewater treatment plant. Removed organic matter is concentrated to remove excess moisture before being loaded onto trucks for shipment outside of the facility. Some hot process streams would be cooled via a non-contact wet surface air cooler, which would generate some particulate emissions from cooling water drift.

All tanks, process vessels at the PTU are connected to a closed loop vapor collection system. The closed loop vapor collection system consists of pipes that collect all vapor from the PTU preventing the vapors from entering the atmosphere. All collected vapors from the closed loop vapor collection systems are sent to the vapor treatment system. Each closed loop vapor collection system/treatment system would be a source of emissions. Collected vapors are treated for VOC removal using 2-stage treatment technology before being released to atmosphere. The proposed 1st stage treatment is biofilter and the 2nd stage unit is activated carbon adsorption. The biofilter includes a media which creates an ideal surface for bacteria to come in contact with the vapors. The bacteria aids in eliminating the fatty acids, and VOCs, with the final carbon treatment used as an air polishing stage. Per the manufacturer, this technology has a proven history of operating in multiple industries for over 20 years.

Each PTU train would also include several storage silos of dry materials called bleached earth and filter aid, which would be added to the feedstock during the treatment process. These silos would each be equipped with dust collectors to reduce the amount of particulate matter emissions from the dry materials.

Several storage tanks at the Rodeo Facility would be physically modified or repurposed to handle renewable feedstocks and products. Changes would include the installation of geodesic domes, vapor control systems, or insulation. These modifications would affect the amounts of VOC emissions from each tank.

The Project would also include the installation of a thermal oxidizer and caustic scrubber STU near the U235 Sulfur Recovery Unit. Under Project operating conditions, the U235 Sulfur Recovery Unit would no longer extract elemental sulfur from facility off-gas, and the STU would serve to control ammonia and hydrogen sulfide emissions that the Sulfur Recovery Unit currently controls. Control of these emissions would require natural gas combustion in the thermal oxidizer, which would result in the generation of additional criteria pollutant emissions.

As a result of the Project, several process units would be shut down and no longer produce emissions. The Project includes the cessation of operations at the Carbon Plant and of the crude handling units, sulfur recovery unit, reformer, and isomerization unit. Emissions associated with each of these process units would no longer occur following the Project, including associated fugitive VOC emissions from component leaks.

Detailed input parameters and assumptions associated with each of the new process units and future emissions estimates can be found in Attachment B of the Air Quality Technical Report (Ramboll 2021).

On-Road Vehicles

On-road vehicles traveling to/from the Rodeo Site consist of heavy-duty hauling diesel trucks and light duty worker vehicles (e.g., passenger cars and light trucks). Heavy-duty truck related activity including roundtrips and mileage data are summarized in Attachment A of the Air Quality Technical Report (Ramboll 2021). All hauling trucks were assumed to be diesel fueled. Baseline emissions from trucks were calculated based on 2019 actual truck trips and expected trip lengths within the BAAQMD boundary; and for the Project, truck emissions were based on estimated truck trips related to refinery deliveries and waste by-products based on the Project design. Emission rates were obtained from the CARB's EMFAC2021 onroad model and are based on Bay Area Air District fleetwide age distribution for T7 tractor

trucks. Worker vehicles are not expected to change as a result of the Project because the number of workers would not change with the Project. Therefore, emissions from worker vehicles were not estimated, but one can presume that emissions resulting from worker vehicles would decrease over time due to fleet turnover and improved vehicle efficiency associated with new model vehicles.

The Carbon Plant and Santa Maria Sites existing conditions include truck traffic related to their operation. Because these facilities would be removed as a result of the Project, the emissions related to these activities would cease, and therefore emissions are only estimated for the baseline. Truck trip emissions in 2019 for the Carbon Plant and Santa Maria were developed similarly to Rodeo Site truck emissions, using EMFAC2021 emission rates for their corresponding Project site air districts.

Marine Traffic

Marine sources at the Rodeo Site consist of tugs, barges, ATBs, and tanker vessels moving feedstock and product to and from the Marine Terminal. Emissions related to marine traffic result from vessel engine exhaust during hoteling at-berth, transit across the San Francisco Bay, and anchorage events throughout the year. Vessels within state waters and 24 nautical miles of the California coastline are assumed to operate on low sulfur marine diesel or gas oil, with 0.1 percent sulfur, consistent with CARB requirements. For analysis of marine traffic, an average activity of 2017 through 2019 was used.

Characteristics for tankers that visited the Marine Terminal during the baseline were extracted from the IHS Fairplay vessel database (IHS Markit 2018); vessel calls were categorized into dead tonnage weight size groups and average characteristics for each group (main engine kilowatts, auxiliary engine kilowatts, engine tier mix) were derived from the database. Barges visiting the terminal during the baseline were classified into two groups: non-self-propelled barges (without a propulsion engine, pulled by tugboat) and ATBs, which are self-propelled. For all barge types, characteristics were extracted from fleet specification sheets available in barge operator's website (Centerline 2021). Tugs were broken down in two categories: assist tugs accompanying tankers and barges through transit and assisting with maneuvering, and tugboats pulling non-self-propelled barges during transit. Future vessels projected to visit during the Project are assumed to have similar vessel specifications (engine loads, tier mix) than those of the same category in the baseline.

Vessel traffic, based on the 3-year baseline average of 2017 through 2019, consisted of 80 tankers of various sizes (dead tonnage weight ranges) 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.

Tug and vessel emissions calculations are based on the CARB's methodology guidance for harbor craft and ocean-going vessels (CARB 2007, 2011, 2019) and San Pedro Bay Ports Emissions Inventory Methodology Report (Starcrest Consulting Group 2019). Detailed parameters and assumptions for marine emissions calculations are included in Attachment A of the Air Quality Technical Report (Ramboll 2021).

Rail Operations

Rail sources at the Rodeo Site consist of linehaul locomotive moving butane railcars during the baseline, and linehaul locomotives moving feedstock railcars during the Project. The rail rack uses a railway cargo handling off-road equipment, instead of a switcher locomotive, to assemble any trains. Emissions are generated by the diesel engines on the linehaul locomotives and from the railway cargo handling equipment. For the baseline, emission estimates are based on 2019 actual destination and counts of railcars to/from Rodeo Site across California. For the Project, the number of linehaul movements is expected to remain the same, but the number of railcars is expected to increase from an average of 4.7 railcars per day in 2019 to 16 railcars per day during the Project. The Carbon Plant Site and Santa Maria Site had rail operations during the 2019 baseline. Because the Project would remove those facilities, emissions related to the rail activities in these Project sites would be eliminated during the Project.

Rail activity is calculated based on yearly linehaul movements at each site, expected trip lengths (miles) and weight of the cargo (tons) by railcars, which combined determine the ton-mileage throughput of a project's rail operation. The ton-mileage is converted to annual fuel consumption using a fleet-wide fuel index, and consequently, grams-per-fuel-gallon emission factors are used to derive emissions. Rail emissions for all three Project sites (Santa Maria, Rodeo and Carbon Plant) follow this methodology and California age-weighted linehaul tier distributions based on CARB guidance (CARB 2021) and consistent with a recent analysis of Rodeo Site rail emissions (Yorke Engineering, LLC 2019). Emissions were estimated based on a fuel index derived from Union Pacific fleetwide average (Union Pacific Railroad Company 2019), activity defined by the Project site operations such as number of railcars, loaded and tare railcar weights, linehaul visit frequency and trip route distribution, reflecting baseline and Project conditions.

4.3.7.3 Health Risk Analysis

Below is a description of the three-step HRA process used to assess potential public health risks from exposures to environmental contaminants from emission sources.

1. A *hazard identification* is performed to determine the pollutants of concern and emissions of TACs are quantified.
2. In the *exposure assessment* step, ground-level impacts resulting from the transport and dilution of these emissions through the atmosphere are assessed at locations of predicted exposure (or "receptors") by air dispersion modeling, typically using, as with this HRA, government-developed computer air dispersion models and local weather data.
3. *Risk characterization*, potential human doses of these compounds resulting from the atmospheric transport are calculated, typically using state-approved procedures, as were used here. Potential cancer and non-cancer health risks resulting from the calculated exposures are estimated using dose-response relationships developed from toxicological data.

The procedures used in the HRA are consistent with the 2015 revisions to the 2003 California Office of Environmental Health Hazard Assessment (OEHHA) guidance, *Air Toxics Hot Spots Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2015), as referenced by the California Air Pollution Control Officers Association document, *Health Risk Assessments for Proposed Land Use Projects* (California Air Pollution Control Officers Association 2009), for conducting HRAs for land use projects. Further details on the HRA assumptions and process are provided in the Air Quality Technical Report (Ramboll 2021). The HRA includes the incorporation of age sensitivity factors to cancer risk calculations.

The HRA for the Project was conducted to assess increased cancer risk, non-cancer chronic health effects, localized annual average $PM_{2.5}$ concentrations from both construction (including the transitional phase interim vessel traffic) and operational sources, and acute health effects. Localized $PM_{2.5}$ concentrations and non-cancer chronic health risks are assessed based on annual average concentrations and exposure. Conversely, cancer risk is assessed based on the increased probability of contracting cancer over a person's lifetime, evaluated as 30 years. To determine whether significant impacts would occur, the cancer risk, non-cancer chronic hazard index, and annual average $PM_{2.5}$ concentration results are compared to the project-related significance thresholds of an increase in cancer risk level greater than 10 in 1 million, a non-cancer chronic hazard index greater than 1.0, and an annual average $PM_{2.5}$ concentration of greater than 0.3 $\mu g/m^3$ of $PM_{2.5}$, respectively each for construction and for operations, as recommended in the BAAQMD CEQA guidelines.

Construction and operation of the Project would result in the release of TACs such as DPM from sources of fuel combustion including engine exhaust from off-road equipment, on-road vehicles, locomotives, and marine vessels. Stationary TAC sources consist of combustion sources and process-related emissions emitted through stacks and fugitive emissions. The HRA includes both new sources associated with the Project, such as the STU and PTU, as well as existing sources whose emissions change as a result of the

Project. This includes shut down sources and sources with decreasing emissions, which may result in highly localized decreases in health risks.

The HRA modeled all new and existing sources associated with the Project and included the net emissions change (increase or decrease) for each source. The effects of each source's net emissions change were analyzed at every receptor modeled in the HRA. This results in a comprehensive analysis that indicates the change in health risk from the Project at every receptor from every emissions source. The HRA may result in certain receptors showing an increase in health risks, and others showing a decrease in health risks relative to the baseline. It is the receptors corresponding to the maximum increase in risk, referred to as maximum exposed individual resident (MEIR) or worker (MEIW), that are used to compare to the significance criteria.

Refer to Appendix B, Section 4.0 Health Risk Assessment, for a detailed discussion of the HRA methodology. Section 2.0 of Appendix B provides an overview of the emissions calculation methodology by source. Construction emissions and pre- and post-project emissions for marine, rail, and truck sources can be found in Attachment A of Appendix B, while pre- and post-project emissions for stationary sources can be found in Attachment B of Appendix B. Pre- and Post-project, as well as net, annual average and maximum one-hour emissions allocated to each modeled source group are presented in Attachment C. Note that modeled source group emissions for Stationary Sources are provided in Attachment B.

Further discussion of the modeling approach (receptor grid, source parameters, meteorological data, etc.) can be found in Section 3.0 of Appendix B. HARP parameters (risk pathways, intake, exposure, etc.) can be found in Table 4-2 of Appendix B. Description of the Cumulative Health Risk Assessment is included in Section 5 of Appendix B.

4.3.8 Discussion of No Air Quality Impacts

Review and comparison of the setting and Project characteristics show that no impacts would occur for some of the CEQA Guidelines criteria related to air quality impacts. Where available, the significance criteria established by the applicable AQMD or APCD may be relied upon to make the following determinations.

Would the Project:

a. Conflict with or obstruct implementation of the applicable air quality plan?

The most recently adopted air quality plan for the Bay Area is the Final 2017 Clean Air Plan, which was adopted by the BAAQMD in April 2017 (BAAQMD 2017c). The Final 2017 Clean Air Plan serves as a multi-pollutant air quality plan to protect public health and the climate. The plan includes a wide range of proposed control measures to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent GHGs. The Final 2017 Clean Air Plan updates the Bay Area 2010 Clean Air Plan and complies with state air quality planning requirements as codified in the California Health and Safety Code (although the 2017 plan was delayed beyond the 3-year update requirement of the code).

The SFBAAB is designated nonattainment for both the 1-hour and 8-hour state ozone standards, and the 8-hour federal ozone standard. In addition, emissions of ozone precursors in the air basin contribute to air quality problems in neighboring air basins, particularly the San Joaquin Valley Air Basin (SJVAB), as Bay Area pollutants are transported inland through the delta. Under these circumstances, state law requires the Clean Air Plan to include all feasible measures to reduce emissions of ozone precursors and to reduce the transport of ozone precursors to neighboring air basins.

The Final 2017 Clean Air Plan contains 85 measures to address reduction of several pollutants: ozone precursors, particulate matter, air toxics, and GHGs. Other measures focus on a single

type of pollutant, such as specific GHGs like CH_4 and black carbon that consists of harmful fine particles that affect public health.

Under the California CAA, the BAAQMD is required to develop an air quality attainment plan for criteria pollutants that are designated as nonattainment within the air district. Several project components would be subject to BAAQMD rules and regulations governing criteria pollutants, TACs, and odorous compounds, even though permits may not be required (e.g., Nuisance). Stationary sources, such as process heaters, boilers, and gas turbines, are required to have permits from the BAAQMD before constructing, changing, or operating the source. If the project is subject to BAAQMD permit requirements, the sources would need to comply with BAAQMD Regulation 2 and proceed through the two-stage Authority to Construct and Permit to Operate process.

The BAAQMD recommends that the agency approving a project where an air quality plan consistency determination is required analyze the project with respect to the following criteria: (1) Does the project support the primary goals of the air quality plan; (2) Does the project include applicable control measures from the air quality plan; and (3) Does the project disrupt or hinder implementation of any Final 2017 Clean Air Plan control measures? If the first two questions are concluded in the affirmative, and the third question concluded in the negative, the BAAQMD considers the project consistent with air quality plans prepared for the Bay Area.

Any project that would not support the Final 2017 Clean Air Plan goals would not be considered consistent with the plan. The recommended measure for determining project support of these goals is consistency with BAAQMD CEQA thresholds of significance. As presented in the subsequent impact discussions, the Project would not exceed the BAAQMD significance thresholds and would result in an overall reduction of local criteria pollutant emissions; therefore, the Project would support the primary goals of the Final 2017 Clean Air Plan. However, a more detailed evaluation of the Project's consistency with the control strategies in the 2017 Clean Air Plan is included in Appendix B, Project Consistency with 2017 Clean Air Plan. As mentioned above, projects that incorporate all feasible air quality plan control measures are considered consistent with the Final 2017 Clean Air Plan. Due to the Project's expected net decrease of emissions from stationary sources at the refinery and the closure of the Carbon Plant, the Project would not impede or conflict with these proposed goals.

In summary, the Project would support the primary goals of the Final 2017 Clean Air Plan, it would be consistent with all applicable BAAQMD rules developed from the plan, and would not disrupt or hinder implementation of any Final 2017 Clean Air Plan proposed control measures. Therefore, there would be no impact associated with, conflicting with, or obstructing implementation of the applicable air quality plan. No impact would occur.

Operations at the Santa Maria Site and the Pipeline Sites and thus, associated emissions, would be eliminated during the Project, also resulting in a net emissions decrease. Therefore, the Project is not expected to conflict or disrupt any goals of local clean air plans affecting those Project sites. No impact would occur.

d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The elimination of crude oil throughput and refining of petroleum-based feedstocks during the Project would result in a substantial reduction of sulfur compounds and would therefore likely have a beneficial impact on emissions associated with common refinery odors at the Santa Maria Site. The Pipeline Sites would be taken out of service (decommissioned) or sold since petroleum feedstocks from Santa Maria Site would no longer be shipped to the Rodeo Refinery. Therefore, no odor impacts would occur during operation and maintenance of the Santa Maria Site and Pipeline Sites.

4.3.9 Direct and Indirect Impacts of the Proposed Project

Table 4.3-10 summarizes the potential air quality impacts, as well as significance determinations for each impact.

Table 4.3-10. Summary of Potential Impacts

Impact	Significance Determination		
	LTS	LTSM	SU
Impact 4.3-1. Would the Project result in a cumulatively considerable net increase fugitive dust emissions for which the project region is nonattainment under an applicable federal or state ambient air quality?			
Rodeo Refinery			
Construction/Demolition Including Transitional Phase		✓	
Santa Maria and Pipeline Sites			
Construction/Demolition	✓		
Impact 4.3-2. Would the Project result in a cumulatively considerable net increase of criteria pollutants associated with vehicle exhaust for which the project region is nonattainment under an applicable federal or state ambient air quality?			
Rodeo Refinery			
Construction/Demolition Including Transitional Phase		✓	
Santa Maria and Pipeline Sites			
Construction/Demolition	✓		
Impact 4.3-3. Would the project expose sensitive receptors to substantial pollutant concentrations?			
Rodeo Refinery, Santa Maria and Pipeline Sites			
Operation and Maintenance	✓		
Offsite Outside SFBAAB			
Operation and Maintenance			✓ Mitigation Pre-empted
Impact 4.3-4. Would the Project expose sensitive receptors to substantial pollutant concentrations?			
Rodeo Refinery, Santa Maria and Pipeline Sites			
Construction/Demolition Including Transitional Phase[a]	✓		
Operation and Maintenance	✓		
Impact 4.3-4. Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			
Rodeo Refinery, Santa Maria and Pipeline Sites			
Construction/Demolition Including Transitional Phase[a]	✓		
Rodeo Refinery			
Operation and Maintenance		✓	
Santa Maria and Pipeline Sites			
Operation and Maintenance	✓		

Notes: LTS = Less than significant, no mitigation proposed
LTSM = Less-than-significant impact with mitigation
SU = Significant and unavoidable

[a] Transitional phase applies only to Rodeo Refinery

* Desert AQMD, Northern Sierra AQMD, Placer County APCD, Tehama County APCD and Shasta County AQMD have significant and unavoidable impacts. Mitigation is pre-empted by federal law. See Table 4.3-17.

IMPACT 4.3-1

b. Would the Project result in a cumulatively considerable net increase in fugitive dust emissions for which the project region is nonattainment under an applicable federal or state ambient air quality?

Construction/Demolition and Transitional Phase: Less than Significant Impact with Mitigation

The Project would involve construction and demolition activities at the Rodeo Refinery, including the Rodeo Site and Carbon Plant, as described in Section 3.10, *Overall Project Construction/Demolition Phase* that would occur in phases over a period of approximately 21 months and are assumed to begin as early as the first quarter of 2022. All demolition and construction associated with the Rodeo Refinery would occur within existing refinery boundaries (except for one laydown area).

The following impact discussion addresses increased PM_{10} and $PM_{2.5.}$ emissions resulting from Project construction and demolition activities. Impact 4.3-2 addresses increases in ROG and NOx from engine exhaust.

Rodeo Refinery

Construction of new facilities and demolition of the Carbon Plant would involve diesel-powered heavy equipment such as loaders, excavators, cranes, and concrete trucks, and lighter-duty equipment such as welders and air compressors, some of which would also be diesel-powered. The use of diesel-powered off-road construction equipment and on-road trucks would result in emissions of dust (including PM_{10} and $PM_{2.5}$) primarily from "fugitive" sources (i.e., emissions released through means other than through a stack or tailpipe) during the construction period, including the transitional phase. Construction would employ up to 500 workers at a time who would commute daily to and from the construction site mostly by means of gasoline-powered private passenger vehicles and light trucks; the construction workforce is expected to be drawn from the greater East Bay region, within a 1-hour commute distance. Hauling trucks would travel a minimum daily of 10 round trips and a maximum daily of 165 round trips during the construction and site preparation phase tentatively from May 2022 through June 2023. Average daily and quarterly emissions from construction activities are shown in Tables 4.3-12 and 4.3-13. In addition to Rodeo Refinery construction emissions and Carbon Plant demolition emissions, emissions from cleaning and removal from service of segments of pipeline and associated tanks (Pipeline Sites) located in BAAQMD boundaries are included for the comparison to local construction emission thresholds.

Santa Maria Site and the Pipeline Sites in San Luis Obispo County

Demolition activities at the Santa Maria Site would involve use of off-road construction equipment and on-road vehicles that produce emissions from vehicle exhaust ($PM_{2.5}$) and fugitive dust (PM_{10}).

The Pipeline Sites would only involve activities related to cleaning-out the pipelines without extensive use of heavy equipment. It is assumed for purposes of emissions calculations that decommissioning of the pipelines would occur over an estimated 1-year period. In addition, estimated emissions from decommissioning of associated tanks and segments of Pipeline 400 located within the San Luis Obispo County APCD are included in the construction activity emissions estimates shown in Tables 4.3-12 and 4.3-13. At this point, Phillips 66 has no plans to reuse the Santa Maria Site or the Pipeline Sites, and any future reuse and remediation would be subject to subsequent environmental analysis, as applicable.

As shown in Tables 4.3-12 and 4.3-13, daily and quarterly emissions from construction activities within San Luis Obispo County would not exceed the applicable significance thresholds recommended by the San Luis Obispo County APCD (2012). Therefore, emissions from demolition of the Santa Maria Site and decommissioning of the Pipeline Sites are estimated to be less than significant.

Impacts in San Luis Obispo County (SCCAB) would be geographically independent of impacts in Contra Costa County (SFBAAB). Because the two sites are in different air basins, emissions are not additive and would be less than significant.

Decommissioning of Pipeline Sites in Other Air Districts

Emissions from cleaning and removing from service segments of pipeline and associated tanks located in other air district would increase $PM_{2.5}$, as summarized in Table 4.3-14. These emissions were compared to construction emissions and PM_{10} thresholds (annual) for each air district that would be affected.

Estimated annual emissions from decommissioning activities within San Joaquin Valley APCD and Santa Barbara County APCD would not exceed the applicable significance thresholds recommended by the respective air districts. Therefore, impacts from these activities are estimated to be less than significant in these air basins.

Impacts in Santa Barbara County (SCCAB) and the San Joaquin Valley (SJVAB) would be geographically independent of impacts in the Contra Costa County (SFBAAB). Because the three sites are in different air basins, emissions are not additive and would be less than significant.

Impact Summary

At the Rodeo Refinery demolition and construction, including the transitional phase, would result in significant impacts related to fugitive dust. Impacts in other air districts would be less than significant and not require mitigation.

Mitigation Measure AQ-1, which requires implementation of effective and comprehensive control measures recommended by the BAAQMD (BAAQMD 2017b), would reduce fugitive dust impacts to less than significant.

Mitigation Measure AQ-1: Implement BAAQMD Basic Control Measures

Construction contractors shall implement the following applicable BAAQMD basic control measures as BMPs:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material offsite shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least 2 times per day, not less than 4 hours apart, on San Pablo Avenue, between the refinery and I-80, and on the access roads between the Carbon Plant and Highway 4. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 2 minutes as recommended by the BAAQMD, and not to exceed 5 minutes as required by the California airborne toxics control measure CCR Title 13, Section 2485. Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications.

- All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

IMPACT 4.3-2

b. Would the Project result in a cumulatively considerable net increase of criteria pollutants associated with vehicle exhaust for which the project region is nonattainment under an applicable federal or state ambient air quality?

Construction/Demolition: Less than Significant Impact with Mitigation

Rodeo Refinery

Demolition and construction activities at the Rodeo Refinery, including the Carbon Plant, would involve use of off-road construction equipment and on-road vehicles that produce exhaust emissions of criteria pollutants including ROG and NO_x,. Refer to Impact 4.3-1 for discussion of PM_{10} and $PM_{2.5}$ emissions.

Project construction exhaust emissions were found to be significant for NOx, mainly related to background Marine Terminal incremental traffic during the Transitional Phase (in Year 2).

Transitional Phase

During the 7-month transitional phase there would be a short-term increase in deliveries and processing of crude oil and gas oil feedstocks by vessels, resulting in increased vessel traffic at the Marine Terminal compared to baseline conditions. During the transitional phase, vessel calls would be more frequent and include approximately 96 tankers and 92 barges (small barges and ATBs combined).

Of the 260 pounds per day of NO_x that would be emitted during the transitional phase, terrestrial NO_x emissions amount to 32 pounds per day (12.3 percent) and incremental marine vessel traffic NO_x is 228 pounds per day (87.7 percent). This would be a temporary, but significant impact.

Mitigation Measure AQ-1 includes implementation of BAAQMD basic control measures that address not only fugitive dust emissions, but also NO_x emissions. Mitigation Measure AQ-2 requires Phillips 66 to prepare and implement a NM Plan prior to the issuance of construction-related permits for site preparation. The purpose of the NM Plan is to document expected construction and transitional phase NOx emissions in detail; and, if necessary, to identify feasible and practicable contemporaneous measures to reduce aggregated construction and transition NOx emissions to below the BAAQMD's 54 pounds per day threshold of significance. With implementation of both Mitigation Measures AQ-1 and AQ-2, NO_x impacts would be less than significant in the SFBAAB.

Santa Maria Site and the Pipeline Sites in San Luis Obispo County

Demolition activities at the Santa Maria Site would involve use of off-road construction equipment and on-road vehicles that produce exhaust emissions of criteria pollutants including ROG and NO_x.

The Pipeline Sites would only involve activities related to cleaning-out the pipelines without extensive use of heavy equipment. It is assumed for purposes of emissions calculations that decommissioning of the pipelines would occur over an estimated 1-year period. In addition, estimated emissions from decommissioning of associated tanks and segments of Pipeline 400 located within the San Luis Obispo County APCD are included in the construction activity emissions estimates shown in Tables 4.3-12 and 4.3-13. At this point, Phillips 66 has no plans to reuse the Santa Maria Site or the

Pipeline Sites, and therefore any assumed future reuse and remediation would be speculative and subject to subsequent environmental analysis, as applicable.

As shown in Tables 4.3-12 and 4.3-13, daily and quarterly emissions from demolition and decommissioning activities within San Luis Obispo County would not exceed the applicable significance thresholds recommended by the San Luis Obispo County APCD (2012). Therefore, impacts from these activities are estimated to be less than significant in this air basin.

Decommissioning of Pipeline Sites in Other Air Districts

Emissions from cleaning and removing from service segments of pipeline and associated tanks in other air districts would increase, as summarized in Table 4.3-14. Emissions were compared to construction emissions thresholds (annual) for each air district that would be affected.

As shown in Table 4.3-14, estimated annual emissions from decommissioning activities within San Joaquin Valley APCD and Santa Barbara County APCD would not exceed the applicable significance thresholds recommended by the respective air districts. Therefore, impacts from these activities are estimated to be less than significant in these air basins.

Impacts in Santa Barbara County (SCCAB) and the San Joaquin Valley (SJVAB) would be geographically independent of impacts in the Contra Costa County (SFBAAB). Because the three sites are in different air basins, emissions are not additive and would be less than significant.

Impact Summary

For the Rodeo Refinery in the SFBAAB, construction and demolition would result in NO_x emissions that exceed the BAAQMD significance thresholds. Therefore, impacts would be significant.

Mitigation Measure AQ-1 includes implementation of BAAQMD basic control measures that address not only fugitive dust emissions, but also NOx emissions. Mitigation Measure AQ-2, requiring implementation of a NO_x Mitigation Plan, would further reduce NO_x emissions. With implementation of Mitigation Measures AQ-1 and AQ-2, NO_x impacts would be less than significant in the SFBAAB.

Mitigation Measure AQ-2: Implement a NOx Mitigation Plan

Phillips 66 shall prepare a NOx Mitigation Plan (NM Plan) prior to the issuance of construction-related permits for site preparation. The purpose of the NM Plan is to document expected construction and transitional phase NOx emissions in detail; and, if necessary, to identify feasible and practicable contemporaneous measures to reduce aggregated construction and transition NOx emissions to below the BAAQMD's 54 pounds per day threshold of significance.

The NOx emissions estimate for the Project shall include consideration of readily available NOx construction and transition emission reduction measures, and/or other emission reduction actions, that shall be implemented during construction and transitional phase of the Project. The NM Plan shall describe the approximate amount of NOx emissions reductions that will be associated with each action and reduction measure on a best estimate basis.

The NM Plan shall be submitted to the Contra Costa County Department of Conservation and Development and the BAAQMD for review and approval, or conditional approval based on a determination of whether the NM Plan meets the conditions described below. The NM Plan shall include those recommended measures listed below needed to reduce the Project's construction and transition NOx emissions to less than the BAAQMD's threshold of significance.

The NM Plan shall include a detailed description of the NOx emissions for all construction and transition activities based on BMPs and use data at the time of Project approval and current estimation protocols and methods. The plan shall, at a minimum, include the following elements:

1. **Project Construction and Transition NOx Emissions** – The Project's construction and transition NOx emission estimates presented in the NM Plan will be based on the emission factors for off-road and on-road mobile sources used during construction and transition, over and above baseline, along with the incorporation of vehicle fleet emission standards. Project construction and transition NOx emission estimates will be based upon the final Project design, Project-specific traffic generation estimates, equipment to be used onsite and during transition, and other emission factors appropriate for the Project prior to construction. The methodology will generally follow the approach used in this Draft EIR and in Appendix B.

2. **NOx Emission Reduction Measures** – The NM Plan shall include feasible and practicable NOx emission reduction measures that reduce or contemporaneously offset the Project's incremental NOx emissions below the threshold of significance. Planned emission reduction measures shall be verifiable and quantifiable during Project construction and transitional phase. The NM Plan shall be consistent with current applicable regulatory requirements. Measures shall be implemented as needed to achieve the significance threshold and considered in the following order: (a) onsite measures, and (b) offsite measures within the San Francisco Bay Area Air Basin. Feasible[31] onsite and offsite measures must be implemented before banked emissions offsets (emission reduction credits) are considered in the NM Plan.

   a. Recommended Onsite Emission Reduction Measures:

      i. Onsite equipment and vehicle idling and/or daily operating hour curtailments;

      ii. Construction "clean fleet" using Tier 4 construction equipment to the maximum extent practicable;

      iii. Reductions in Vessel and/or Rail Traffic;

      iv. Other onsite NOx reduction measures (e.g., add-on NOx emission controls); or

      v. Avoid the use of Suezmax vessels to the maximum extent practicable.

      Additional measures and technology to reduce NOx emissions may become available during the Project construction and operation period. Such measures may include new energy systems (such as battery storage) to replace natural gas use, new transportation systems (such as electric vehicles or equipment) to reduce fossil-fueled vehicles, or other technology (such as alternatively-fueled emergency generators or renewable backup energy supply) that is not currently available at the project-level. As provided in the NM Plan, should such measures and technology become available and be necessary to further reduce emissions to below significance thresholds, Phillips 66 shall demonstrate to the Contra Costa County Department of Conservation and Development and BAAQMD satisfaction that such measures are as, or more, effective as the existing measures described above.

   b. Recommended Offsite Emission Reduction Measures:

      Phillips 66, with the oversight of the Contra Costa County Department of Conservation and Development and BAAQMD, shall reduce emissions of NOx by directly funding or implementing a NOx control project (program) within the San Francisco Bay Area Air Basin to achieve an annual reduction equivalent to the total estimated construction NOx emission reductions needed to lower the Project's NOx impact below the 54 pound per

[31] For the purposes of this mitigation measure, "feasible" shall mean as defined under CEQA "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

day significance threshold. The offsite measures will be based on the NOx reductions necessary after consideration of onsite measures.

To qualify under this mitigation measure, the NOx control project must result in emission reductions within the San Francisco Bay Area Air Basin that would not otherwise be achieved through compliance with existing regulatory requirements or other program participation. Phillips 66 shall notify Contra Costa County within six months of completion of the NOx control project for verification.

3. **Annual Verification Reports** – Phillips 66 shall prepare an Annual NM Verification Report in the first quarter of each year following construction or transitional phase activities, while Project construction activities at the site are ongoing. The reporting period will extend through the last year of construction. The purpose of the Report is to verify and document that the total Project construction and transitional phase NOx emissions for the previous year, based on appropriate emissions factors for that year and the effectiveness of emission reduction measures, were implemented.

   The Report shall also show whether additional onsite and offsite emission reduction measures, or additional NOx controls, would be needed to bring the Project below the threshold of significance for the current year. The Report shall be prepared by Phillips 66 and submitted to the Contra Costa County Department of Conservation and Development and the BAAQMD for review and verification. NOx offsets for the previous year, if required, shall be in place by the end of the subsequent reporting year. If Contra Costa County and the BAAQMD determine the report is reasonably accurate, they can approve the report; otherwise, Contra Costa County and/or the BAAQMD shall identify deficiencies and direct Phillips 66 to correct and re-submit the report for approval.

Table 4.3-11. Average Daily Construction-Related Exhaust Emissions: Rodeo Refinery and Carbon Plant and Pipeline Sites Decommissioning within the BAAQMD

Source	Construction Exhaust Emissions (lb/day)			
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**ROG**
Year 1 of Construction Activities				
Rodeo Site Construction Equipment	0.6	0.6	18.0	2.5
Rodeo Site Construction Vehicles	0.5	0.5	24.4	0.9
Total	**1.1**	**1.0**	**42.3**	**3.4**
CEQA Threshold	82.0	54.0	54.0	54.0
Above Threshold?	No	No	No	No
Year 2[a] of Construction Activities				
Rodeo Site Construction Equipment	0.6	0.5	17.7	2.2
Rodeo Site Construction Vehicles	0.1	0.1	3.6	0.2
Background Marine Terminal Incremental Traffic (Transitional Phase)	6.0	5.6	228.0	12.2
Carbon Plant Demolition[b]	0.3	0.2	6.5	0.6
Pipeline Sites' Tank Decommissioning	--	--	1.1	4.0
Pipeline Decommissioning	--	--	--	30.0
Total	**6.9**	**6.4**	**257.0**	**49.2**

Table 4.3-11. Average Daily Construction-Related Exhaust Emissions: Rodeo Refinery and Carbon Plant and Pipeline Sites Decommissioning within the BAAQMD

Source	Construction Exhaust Emissions (lb/day)			
	PM_{10}	$PM_{2.5}$	NO_x	ROG
CEQA Threshold	82	54	54	54
Above Threshold?	No	No	Yes	No

[a] Second year of construction would occur concurrently with Transitional Phase during which Marine Terminal traffic at the Rodeo Site would increase by 18 visits above baseline level during a 7-month period.

[b] Emissions from the Carbon Plant future demolition activities are conservatively added to second year of construction period within the BAAQMD. Construction start and end dates were assumed for purposes of estimating emission factors. More specific timing will be determined at a later date.

Table 4.3-12. Estimated Daily Construction-Related Exhaust Emissions: Santa Maria Site and Pipeline Sites, San Luis Obispo County

Source	Construction Emissions (pounds per day)	
	Diesel PM_{10}	$ROG+NO_x$
Santa Maria Demo Off-Road Construction Equipment	1.2	32.5
Santa Maria Demo On-Road Vehicles	< 0.01	0.8
Pipeline Site Tank Decommissioning	--	15.5
Pipeline Decommissioning (San Luis Obispo County Segment)	--	30.0
Total	**1.2**	**78.7**
San Luis Obispo County APCD Significance Threshold	7	137
Exceeds Threshold?	No	No

Table 4.3-13. Estimated Quarterly Construction-Related Emissions: Santa Maria Site and Pipeline Sites, San Luis Obispo County

Source	Construction Emissions (Quarterly Tons)		
	Diesel PM_{10}	$ROG+NO_x$	Fugitive PM_{10}
Santa Maria Demo Off-Road Construction Equipment	0.04	1.06	--
Santa Maria Demo Fugitive Dust	--	--	0.02
Santa Maria Demo On-Road Vehicles	< 0.01	0.03	0.01
Pipeline Site Tank Decommissioning	--	0.87	--
Pipeline Decommissioning (San Luis Obispo County Segment)	--	0.49	--
Total	**0.04**	**2.44**	**0.03**

Table 4.3-13. Estimated Quarterly Construction-Related Emissions: Santa Maria Site and Pipeline Sites, San Luis Obispo County

Source	Construction Emissions (Quarterly Tons)		
	Diesel PM_{10}	**ROG+NO_x**	**Fugitive PM_{10}**
San Luis Obispo County APCD Significance Threshold—Tier 1	0.13	2.5	2.5
Above Tier 1 Threshold?	No	No	No
San Luis Obispo County APCD Significance Threshold—Tier 2	0.32	6.3	--
Above Tier 2 Threshold?	No	No	--

Table 4.3-14. Estimated Annual Maximum Construction-Related Emissions: Pipeline Sites Decommissioning Within San Joaquin Valley APCD and Santa Barbara County APCD

Air District	Source	NOx (tons/year)	ROG (tons/year)
San Joaquin Valley APCD	Tank Decommissioning	0.04	5.95
	Pipeline Decommissioning	--	0.49
	Total	**0.04**	**5.95**
	CEQA Threshold	10	10
	Above Threshold?	No	No
Santa Barbara County APCD	Tank Decommissioning	0.04	5.95
	Pipeline Decommissioning	--	0.49
	Total	**0.04**	**5.95**
	CEQA Threshold	25	25
	Above Threshold?	No	No

IMPACT 4.3-3

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

Operation and Maintenance: Less Than Significant, No Mitigation Proposed

Rodeo Refinery

Implementation of the Project would change operational emissions from the following components at the Rodeo Refinery within the SFBAAB as discussed below.

Stationary Sources

Implementation of the Project would result in both increases and decreases of criteria pollutant emissions from the new or modified stationary sources at the Rodeo Refinery. Changes to individual units and processes are described in Chapter 3, *Project Description*, Section 3.9, *Project*

Components. The Project includes the cessation of operations at the Carbon Plant and of several existing processing units at the Refinery Site (see Table 3-3). As a result of the Project, several process units would become idle (i.e., not operational) and therefore no longer produce emissions; however, the current emissions analysis is conservatively not taking credit for idle units and assumes 2019 emissions remain constant for units for which the permit is maintained. Considering all the aforementioned, criteria emissions from the sum of all stationary sources in the Project would generate fewer emissions than stationary sources during the 2019 baseline, i.e., an overall net emissions decrease.

Truck Traffic

There is presently heavy-duty truck traffic associated with deliveries and waste by-products for the Rodeo Refinery operations. Rodeo Refinery related truck traffic in 2019 consisted of 40,213 roundtrips per year. Truck traffic to and from the Carbon Plant Site related to the transport of petroleum coke, which totaled 32,673 round trips in 2019, would no longer occur, while Rodeo Site annual truck trips related to the Project would increase by about 8,400, meaning that overall total annual truck round trips under the Project would decrease to approximately 16,000 truck roundtrips per year. Criteria pollutant emissions are generated from diesel engines exhaust in the trucks, while fugitive dust emissions are generated by road dust lifted during truck movement and trucks tire and brake wear. Overall, truck emissions are expected to decrease because of reduced truck traffic during Project operation.

Marine Traffic

The existing Marine Terminal at the Rodeo Site handles feedstocks and product shipments coming through tankers of various sizes and barges. Barges comprise two categories: non-self-propelled barges, that is barges pulled by a towboat/tug, and ATB barge which are self-propelled. Support from assist tugs during transit of all vessels are also part of the marine traffic. Based on the 3-year baseline, the Rodeo Site had on average 80 tankers calls and 90 barge calls per year (non-self-propelled and ATBs combined). During the Project, vessel calls would be more frequent than under baseline conditions, approximately 201 tankers and 161 ATBs, and the mixture of vessel sizes and types would be different than under baseline conditions. Some of the larger vessel categories bringing crude during baseline (Panamax, Suezmax) are not expected to transport materials to and from the Marine Terminal during the Project.

Increased vessel traffic from baseline levels during the Project would result in an increase in transit emissions. On the other hand, visits of large tankers (Panamax, Suezmax) would likely decrease during the Project, and the change in vessel mix from the baseline would result in lower emissions on an individual-call basis. Overall, however, marine traffic annual mass emissions are expected to increase during the Project due to increased vessel traffic.

Railcar Unloading

The existing butane rail loading stations would be repurposed for the unloading of renewable feeds. The rail rack operations in 2019 consisted of a daily visit of one linehaul locomotive loading on average of 4.7 butane railcars for shipment. During the Project, the rail rack operations are expected to consist of one linehaul locomotive train visit per day bringing a maximum of 16 railcars of renewable feedstock. Although the number of locomotive visits is not expected to change during the Project, rail emissions are expected to increase slightly due to the increased number of railcars per train, which would be reflected as increased fuel consumption of the locomotive diesel engines.

Operational Components Emissions

Estimated maximum annual emissions from operation of the Project within the SFBAAB are summarized in Table 4.3-15; estimated average daily emissions are summarized in Table 4.3-16.

CEQA baseline emissions shown in these tables as "Baseline Emissions Rodeo Refinery with Air Liquide" are totals from Tables 4.3-6 and 4.3-7, respectively. As described in Section 4.3.5.1, *Construction and Emission Estimates*, truck and rail emissions include all travel within the SFBAAB boundaries and vessel emissions include hoteling emissions at the Marine Terminal and at anchorage sites in the Bay, and transiting emissions between the Marine Terminal and the Pilot Buoy west of the Golden Gate. The Project at full capacity, which would eliminate crude oil refining at the Rodeo Facility, would result in decreases in annual and daily average emissions of all criteria pollutants relative to the baseline. Therefore, impacts from these Project operations would remain below the thresholds and are estimated to be less than significant. No mitigation is required.

Table 4.3-15. Estimated Maximum Annual Operational Emissions: Rodeo Refinery Components

Source	Emissions (tons/year)					
	VOC	NO_x	PM_{10}[a]	$PM_{2.5}$[a]	SO_2	CO
Rodeo Facility Project Emissions						
Ocean-going Vessels and Harbor Craft	16	266	7	7	11	87
Trucks	0.03	2.38	2.10	0.37	0.02	0.19
Rail	0.18	4.79	0.11	0.10	0.08	1.38
Facility Stationary Sources	111	210	71	69	295	51
Total Operational	***127***	***483***	***81***	***76***	***307***	***140***
Air Liquide H_2 Plant	1	22	5	5	0	1
Total Operational with Air Liquide	***129***	***505***	***85***	***81***	***307***	***141***
CEQA Impact Evaluation						
Baseline Emissions Rodeo Refinery with Air Liquide	129	756	105	98	1,435	152
Project Minus CEQA Baseline	-0.64	-250	-20	-18	-1,129	-11
Significance Threshold	10	10	15	10	--	--
Exceeds Threshold?	No	No	No	No	--	--

[a] PM_{10} and $PM_{2.5}$ emissions include exhaust and fugitive dust sources (road dust, tire and brake wear).

Table 4.3-16. Estimated Daily Average Operational Emissions: Rodeo Refinery Components

Source	Emissions (lb/day)					
	VOC	NO_x	PM_{10}[a]	$PM_{2.5}$[a]	SO_2	CO
Rodeo Facility Project Emissions						
Ocean-going Vessels and Harbor Craft	89	1,457	39	36	60	478
Trucks	0.15	13	11	2	0.11	1
Rail	1.00	26.27	0.62	0.57	0.46	7.57
Facility Stationary Sources	607	1,152	391	378	1,619	279
Total Operational	***698***	***2,648***	***442***	***416***	***1,680***	***766***
Air Liquide H_2 Plant	8	120	26	25	0	7
Total Operational with Air Liquide	***705***	***2,768***	***467***	***441***	***1,680***	***773***

Source	Emissions (lb/day)					
	VOC	NO_x	PM_{10}[a]	$PM_{2.5}$[a]	SO_2	CO
CEQA Impact Evaluation						
Baseline Emissions Rodeo Refinery with Air Liquide	709	4,140	577	539	7,865	833
Project Minus CEQA Baseline	-4	-1,372	-110	-98	-6,185	-60
Significance Threshold	54	54	82	54	--	--
Exceeds Threshold?	No	No	No	No	--	--

[a] PM_{10} and $PM_{2.5}$ emissions include exhaust and fugitive dust sources (road dust, tire and brake wear).

Santa Maria Site

The Santa Maria Site would be phased-out and decommissioned since its output (petroleum feedstocks) would no longer be shipped via pipeline to the refinery. Operational impacts during the Project for this site would be zero.

Impacts in San Luis Obispo County (SCCAB) would be geographically independent of impacts in Contra Costa County (SFBAAB). Because the Santa Maria Site would no longer operate during the Project, emissions are not additive and would be less than significant.

Pipeline Sites

The Pipeline Sites would be taken out of service (decommissioned) or sold since petroleum feedstocks from Santa Maria Site would no longer be shipped to the refinery. Operational impacts during the Project for this site would be zero.

Impacts in in San Luis Obispo County (SCCAB), Santa Barbara County (SCCAB), and the San Joaquin Valley (SJVAB) would be geographically independent of impacts in Contra Costa County (SFBAAB). Because the three sites are in different air basins, emissions are not additive and would be less than significant.

Rail Transport Outside the SFBAAB (Significant and Unavoidable, Mitigation Pre-Empted)

For affected air districts, Table 4.3-17 shows the potential incremental rail transport emissions by District along with significant thresholds for each District where thresholds could be exceeded resulting in a significant and unavoidable impact. The incremental emissions within each air district were conservatively estimated with an assumption that each rail route in California would accommodate full Project rail traffic. This assumption is conservative because total railcar shipments are typically distributed amongst the three California routes (i.e., northern, eastern, and southern), but the distribution for the Project cannot be known in advance. Using this conservative assumption, the analysis indicates that rail transport emissions were slightly higher than the applicable thresholds in the San Joaquin Valley APCD (SJVAPCD), Butte County AQMD (BCAQM), Mojave Desert AQMD (MDAQMD), Northern Sierra AQMD (NSAQMD), Placer County APCD (PCAPCD), Tehama County APCD (TCAPCD) and the Shasta County AQMD (SHAQMD).[32] Operational impacts in the seven aforementioned air districts would be geographically independent of impacts in Contra Costa County (SFBAAB). Rail transport emissions in all other air districts through which trains transporting Project materials would pass would be less than significant. For more information on the significance thresholds and less than significant impacts related to rail transport in other air districts outside of SFBAAB, refer to Attachment A in Appendix B, *Air Quality and Greenhouse Gas Emissions Technical Data*.

[32] Shasta County Air Quality Management District is used here in lieu of South Coast Air Quality Management District, which commonly refers to the South Coast Air Quality Management District.

Table 4.3-17. Rail Transport Incremental Emissions by Air District

Pollutant	Daily Incremental Emissions from Rail (lb/day)*							Annual Incremental (tpy)*	
AIR DISTRICT ->	BCAQMD	MDAQMD	NSAQMD	PCAPCD	SHAQMD	SJVAPCD	TCAPCD	MDAQMD	SJVAPCD
NOx	34.3	162.9	36.7	63.6	56.6	180.0	30.5	30.2	34.1
CO	8.1	38.6	8.7	15.1	13.4	42.9	7.2	7.2	8.1
VOC	1.3	6.1	1.4	2.4	2.1	6.7	1.1	1.1	1.3
PM10	0.8	3.8	0.8	1.5	1.3	4.1	0.7	0.7	0.8
PM2.5	0.7	3.5	0.8	1.3	1.2	3.8	0.7	0.6	0.7
SO2	0.6	2.8	0.6	1.1	1.0	3.1	0.5	0.5	0.6
	Air District Daily Significant Emissions Thresholds - Daily							Annual Threshold	
AIR DISTRICT ->	BCAQMD	MDAQMD	NSAQMD	PCAPCD	SHAQMD	SJVAPCD	TCAPCD	MDAQMD	SJVAPCD
NOx	25	137	24	55	25	100	25	25	10
CO	—	548	—	—	500	100	—	100	100
VOC	25	137	24	55	25	100	25	25	10
PM10	80	82	79	82	80	100	80	15	15
PM2.5	—	65	—	—	—	100	—	12	15
SO2	—	137	—	—	80	100	—	25	27
	Thresholds Evaluation (incremental emissions above threshold?)								
	Daily							Annual	
AIR DISTRICT ->	BCAQMD	MDAQMD	NSAQMD	PCAPCD	SHAQMD	SJVAPCD	TCAPCD	MDAQMD	SJVAPCD
NOx	Yes (SU)	Yes (SU)	Yes (SU)	Yes (SU)	Yes (SU)	Yes (SU)	Yes (SU)	Yes (SU)	Yes (SU)
CO	—	No	—	—	No	No	—	No	No
VOC	No	No	No	No	No	No	No	No	No
PM10	No	No	No	No	No	No	No	No	No
PM2.5	—	No	—	—	—	No	—	No	No
SO2	—	No	—	—	No	No	—	No	No

* Daily incremental rail emissions = Project (lb/day) minus 2019 (lb/day)

Annual incremental rail emissions = Project (tpy) minus 2019 (tpy)

Air Districts: Butte County AQMD (BCAQMD), Mojave Desert AQMD (MDAQMD), Northern Sierra AQMD (NSAQMD), Placer County APCD (PCAPCD), Shasta County AQMD (SHAQMD), San Joaquin Valley APCD (SJVAPCD), Tehama County APCD (TCAPCD)

Impact Summary

In Contra Costa County, which is within the SFBAAB, operation of the proposed Project would result in a net emissions decrease of all pollutants compared to baseline levels. Thus, the operational impact would be less than significant, and no mitigation would be required (i.e., the proposed Project in itself would encompass mitigation) except for potentially significant and unavoidable (SU) impacts

for NOx with respect to rail operations in San Joaquin Valley APCD, Butte County AQMD, Mojave Desert AQMD, Northern Sierra AQMD, Placer County APCD, Tehama County APCD and Shasta County AQMD. However, any mitigation measures to address potentially significant and unavoidable impacts from rail transport operations, whether within or outside the SFBAAB, would be legally infeasible because of preemption by federal law governing rail transportation.[33]

In *Sierra Club v. County of Fresno*, 6 Cal. 5th 502 (2018),[34] the California Supreme Court determined that the air quality analysis in the EIR was inadequate because it did not make "a reasonable effort to substantively connect the project's air quality impacts to likely health consequences." The court determined that "the EIR should be revised to relate the expected adverse air quality impacts to likely health consequences or explain in meaningful detail why it is not feasible at the time of drafting to provide such an analysis."

This section has evaluated the potential air quality impacts of the Project and has concluded that the Project has the potential to result in significant and unavoidable air quality impacts related to rail operations in seven air districts outside of BAAQMD. The estimated rail NO_x and PM_{10} emissions (as DPM) have been conservatively overstated, with 100 percent of all operations allocated to each of the three potential routes. However, because rail transport would occur over the three potential routes, each route would be expected to carry less than 100 percent of rail shipments, thus, the probability of any actual significant impact along a single route, whether daily or annual, is low

It is currently infeasible to correlate specific health effects to these potentially significant air quality impacts. From a technical perspective, the affected air districts do not have approved methodologies for translating project-level emissions, such as NO_x and PM_{10} emissions from mobile source growth, to specific health outcomes. Furthermore, these estimated emissions are associated with existing rail operations with corresponding actual NO_x and PM_{10} emissions, which by nature are in transit (i.e., variable), making any modeling or predictive analysis of the health effects of such emissions uncertain, unproveable, and speculative. For all of these reasons, it is infeasible to relate the potentially significant air quality impacts to any specific health consequences in affected air districts. As a result, it is infeasible to identify what and where mitigation measures could be implemented to address specific health consequences. In addition, potential mitigation such as altering rail operations (e.g. preventing or delaying operation), would be pre-empted by federal law, and hence, legally infeasible (see footnote). Contra Costa County does not have the authority to impose such mitigation measures. Therefore, health effects associated with rail activity outside the SFBAAB would be significant and unavoidable. However, this does not prevent the affected air districts from developing appropriate methodologies and working with the Union Pacific Railroad and Phillips 66 to develop potential mitigation that would not unreasonably burden or interfere with rail transportation.

Mitigation Measure AQ-3: Mitigation Pre-empted by Federal Law

[33] The Interstate Commerce Commission Termination Act of 1995, 49 USC § 10101 et seq., broadly preempts state and local environmental regulations that have the effect of managing or governing rail transportation. Association. of Am. R.R. vs. Coast Air Quality Mgmt. Dist., 622 F.3d 1094, 1098 (9th Cir. 2010). Even state and local actions that do not directly regulate railroads can be preempted by this Act, depending on the degree of interference that an action has on railroad operations. As applied in the CEQA context, the Act prohibits a lead agency from requiring any mitigation that, even indirectly, "imposes an unreasonable burden on or interference with rail transportation." Ass'n of Irritated Residents v. Kern County. Board of Supervisors, 17 Cal. App. 5th 708, 753 (2017), rev. denied, 2018 Cal. LEXIS 833 (2018). What matters for the purposes of this analysis is the effect, rather than the intent, of the regulatory action. See Friends of the Eel River v. North Coast R.R. Auth., 3 Cal. 5th 677, 717 (2017), cert. denied, 138 S.Ct. 1696 (2018) ("[I]t is well settled that states [and local governments] cannot take an action that would have the effect of foreclosing or unduly restricting a railroad's ability to conduct any part of its operations or otherwise unreasonably burdening interstate commerce." (internal quotation marks omitted))

[34] State of California, Court of Appeal, 5th Appellate District (6 Cal. 5th 502). 2018. Sierra Club v. County of Fresno. Available at: https://cases.justia.com/california/supreme-court/2018-s219783a.pdf?ts=1545687370 and https://cases.justia.com/california/court-of-appeal/2020-f079904.pdf?ts=1606257048. Accessed August 3, 2021.

IMPACT 4.3-4

c. Would the Project expose sensitive receptors to substantial pollutant concentrations?

Construction/Demolition Including Transitional Phase: Less Than Significant, No Mitigation Proposed

Rodeo Refinery

Construction of the Project at the Rodeo Refinery, including the Carbon Plant, would result in the release of TACs from mobile sources including diesel engine exhaust particulate matter from off-road equipment and on-road vehicles. The HRA analysis for construction also included the Transitional Phase. This phase includes a 7-month period within the overall construction schedule resulting in increased vessel traffic at the Marine Terminal compared to baseline conditions. During the Transitional Phase, vessel calls would be more frequent than under baseline conditions, approximately 96 tankers and 92 ATBs; however, this condition would be temporary.

For the Construction and transitional phase, the location of the maximum residential impacts from those activities was in Tormey (refer to Attachment I, Figures 3-11a and b, and 3-12a and b for the analysis locations). At that location, the maximum residential net cancer risk (MEIR) was 7.71 in a million, the net chronic HI was 0.006 and the acute HI was 0.05. The location of maximum worker impacts from those activities was also in Tormey. At that location, the maximum worker net cancer risk (MEIW) is 0.17 in a million and the net chronic hazard index for a worker is 0.009.

The results of the HRA for construction impacts were also analyzed at the MEIR location for overall Project operations, located in Vallejo. The results of the HRA for Construction (including Transitional Phase) are summarized in Table 4.3-18.

Table 4.3-18. Rodeo Refinery Construction (including Transitional Phase) HRA Results for Residential and Worker for Cancer, Chronic, Acute

Type of Estimated Health Impact	Excess Lifetime Cancer Risk[a] (in a million)	Chronic Hazard Index[b] (unitless ratio)	$PM_{2.5}$[c] ($\mu g/m^3$)	Acute Hazard Index[d] (unitless ratio)
Residential Receptor—2 Years of Construction—Construction MEIR	7.71	0.006	0.027	n/a
Worker Receptor—2 Years of Construction—Construction MEIR	0.17	0.009	n/a	n/a
Acute Receptor—Construction MEIR	n/a	n/a	n/a	0.05
Residential Receptor—2 Years of Construction—Project MEIR	1.45	0.002	0.005	n/a
Worker Receptor—2 Years of Construction—Project MEIR	0.024	0.002	NA	NA
Acute Receptor—Project MEIR	NA	NA	NA	0.03
BAAQMD Significance Threshold	10.0	1.0	0.3	1.0
Exceed Threshold?	No	No	No	No

Notes: NA = not available

[a] MEIR for cancer risk located at UTMx 566126.85, UTMy 4211554.14. MEIW for cancer risk located at UTMx 565917.61, UTMy 4211339.26.
[b] MEIR for chronic hazard index located at UTMx 566126.85, UTMy 4211554.14. MEIW for chronic hazard located at UTMx 565917.61, UTMy 4211339.26.
[c] MEIR for $PM_{2.5}$ located at UTMx 566126.85, UTMy 4211554.14.
[d] MEI for acute hazard index located at UTMx 567,408, UTMy 4,212,228.

As shown in Table 4.3-18, cancer risk, non-cancer chronic hazard index, annual average $PM_{2.5}$ concentration, and acute hazard index results for project construction are all below the following project-level significance thresholds:

- An increase in cancer risk level greater than 10 in 1 million;
- A non-cancer chronic or acute hazard index greater than 1.0; and
- An annual average $PM_{2.5}$ concentration of greater than 0.3 µg/m^3.

For Construction, the maximum residential net cancer risk at the construction MEIR and the Project MEIR (7.71 and 1.45 in a million, respectively) is largely driven by emissions from heavy equipment and truck travel along San Pablo Road. In summary, the net chronic hazard index at the construction MEIR and the Project MEIR (0.17 and 0.024, respectively) and the acute hazard index at the construction MEIR and Project MEIR (0.05 and 0.03, respectively) from construction are below the significance threshold of 1.0, and the $PM_{2.5}$ concentration (0.027 and 0.005 µg/m^3, at the construction MEIR and project MEIR) is very low compared to the threshold. Additional details on the HRA analysis can be found in Appendix B, Attachment 4.0, Health Risk Assessment. Therefore, construction and demolition at the Rodeo Refinery, including the Carbon Plant, would not expose sensitive receptors to substantial pollutant concentrations. The impact would be less than significant and no mitigation is required.

Santa Maria Site and Pipeline Sites

There is no HRA of the demolition of the Santa Maria Site because there are no sensitive receptors within 1,000 feet (305 meters) of the site. Emissions associated with the cleaning of the pipeline and tanks are minimal and for only a brief duration. The impact would be less than significant and no mitigation is required.

Operation and Maintenance: Less Than Significant, No Mitigation Proposed

Rodeo Refinery

As discussed in Section 4.3.5 and Appendix B, all sources (stationary, marine, rail, trucks) considered to be part of the Project were modeled in the HRA. See Stationary Source Tables 2 and 3 of Appendix B Attachment B for modeled emission rates broken out by source group for stationary sources. See Appendix B, Attachment C1 through C4 for modeled emission rates broken out by source group for marine, truck, rail, and construction sources, respectively. Sources unaffected by the Project (zero net change in emissions and thus zero net change in risk) were not included in the HRA.

Operation of the Project at the Rodeo Refinery, including the Carbon Plant, would result in the release of TACs from stationary sources and mobile sources including engine exhaust from off-road equipment (e.g., forklifts), on-road vehicles, locomotives, and marine vessels. Results of the HRA for the operational emissions are summarized in Table 4.3-19.

As shown in Table 4.3-19, cancer risk, non-cancer chronic hazard index, annual average $PM_{2.5}$ concentration, and acute hazard index results for project operation are all below the project-level significance thresholds listed above. For long-term operations, the maximum residential net cancer risk (8.33 in a million) is largely driven by contributions from marine vessels, while the net chronic hazard index (0.14), the net acute hazard index (0.6) and $PM_{2.5}$ concentration (0.22 µg/m^3) are being driven by stationary sources. The operational MEI for cancer risk is in Vallejo, whereas the MEI for hazards index and $PM_{2.5}$ are in Crockett. Additional details on the HRA analysis can be found in the Air Quality Technical Report (Ramboll 2021).

Table 4.3-19. Rodeo Refinery Operational MEIR Results for Residential and Worker for Cancer, Chronic, Acute

Type of Estimated Health Impact	Excess Lifetime Cancer Risk[a] (in a million)	Chronic Hazard Index[b] (unitless ratio)	$PM_{2.5}$[c] ($\mu g/m^3$)	Acute Hazard Index[d] (unitless ratio)
Residential Receptor—30 Years of Operation	8.33	0.14	0.22	NA
Worker Receptor—30 Years of Operation	0.51	0.17	NA	NA
Acute Receptor	n/a	NA	NA	0.39
BAAQMD Significance Threshold	10.0	1.0	0.3	1.0
Exceed Threshold?	No	No	No	No

Notes:

[a.] MEIR for cancer risk located at UTMx 566686, UTMy 4214279. MEIW for cancer risk located at UTMx 567215, UTMy 4213753.

[b.] MEIR for chronic hazard index located at UTMx 567333, UTMy 4212103. MEIW for chronic hazard located at UTMx 566577, UTMy 4211924.

[c.] MEIR for $PM_{2.5}$ located at UTMx 567308, UTMy 4212253.

[d.] MEI for acute hazard index located at UTMx 566488, UTMy 4210717.

Table 4.3-20 shows the results of the cumulative community background HRA consistent with the BAAQMD CEQA Guidelines. The BAAQMD Stationary Source Screening Tool was used to identify existing offsite (i.e., non-Project) permitted stationary sources within 1,000 feet (305 meters) of each of the potentially maximally exposed individual residents (MEIRs) for cancer risk, hazard index and $PM_{2.5}$. A stationary source inquiry form was submitted to the BAAQMD to request updates; however, no offsite stationary sources were identified as being within 1,000 feet of the MEIRs. The BAAQMD also provided information in a geographic information system (GIS) format that contained the risks from roadways greater than 30,000 average daily traffic trips and railways. In combination with the project-level analyses described above, and the BAAQMD cumulative risk thresholds, the Project would not have a cumulatively considerable impact in the community.

Table 4.3-20. Summary of Cumulative Impacts Using the BAAQMD Methodology

Nearby Sources[a]	Excess Lifetime Cancer Risk (MEIR) (in a million)	Noncancer Chronic Hazard Index (MEIR) (unitless)	$PM_{2.5}$ Concentration (MEIR) ($\mu g/m^3$)
Existing Stationary Sources[b]	--	--	--
Roads/Highways[c,d]	5.8	--	0.18
Major Streets[d,e]	0.044	--	0.00093
Railways[d]	6.4	--	0.019
Project Net Operations[g]	8.33	0.14	0.22
Project Construction[f]	1.45	0.002	0.005
Total	**22**	**0.15**	**0.42**
Exceeds Threshold?	**NO**	**NO**	**NO**
Threshold	**100**	**10**	**0.80**

Notes: $\mu g/m^3$ = microgram per cubic meter
MEIR = maximally exposed individual residents
$PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less

a. Details for each source are shown in the preceding tables. If the cell is marked with "--", no risk was calculated. For roadways, highways, major streets, and railways, chronic hazard index is not calculated in the BAAQMD screening tools.

b. Consistent with the BAAQMD guidance, Ramboll included all facilities within 1,000 feet of the MEIRs as per the BAAQMD Stationary Source Screening Analysis Tool. No facilities were identified; therefore no values were adjusted accordingly for distance from the MEIRs using the BAAQMD guidance.

c. Ramboll searched for additional nearby roads between 10,000 and 30,000 average daily trips and confirmed there are no roadways with average daily traffic between 10,000 and 30,000 trips per day within 1,000 ft of the cancer or chronic/$PM_{2.5}$ MEIRs.

d. Nearby major streets, highway, and railway cancer and $PM_{2.5}$ impacts were taken from the BAAQMD raster files for the Project area. The BAAQMD's raster screening tools do not estimate chronic hazards since the screening levels were found to be extremely low. Thus, there are no chronic hazard values associated with highways, railways, or major streets.

e. Major streets, as evaluated in the BAAQMD raster screening tools, include all streets with average daily traffic above 30,000 trips per day.

f. Both the Project Operations and Construction risks include childhood exposure from 0 to 2 years**.** When added, this conservatively doubles the childhood exposure period**.** Actual cumulative projects risks are lower. Similarly, chronic hazard index and $PM_{2.5}$ concentrations are averaged only over a year, where the maximum yearly concentration from construction and operation is reported from the Project and Construction Risks.

g. The potential cumulative effect of the proposed Martinez Refinery Renewable Fuels Project was considered (https://www.contracosta.ca.gov/7961/Martinez-Refinery-Renewable-Fuels-Project), but the Martinez Project is not estimated to add to the cumulative condition. The Project Overview states: “The two marine terminals currently handle approximately 160 ships per year. Under the Project, the two marine terminals are expected to handle up to 35% fewer ships per year.” The Notice of Preparation for the Martinez Project does not reference an increase in vessel traffic relative to existing conditions.

Impact Summary

As shown above, the HRA results of Project construction and operation do not indicate exceedances of applicable cancer risk, non-cancer chronic hazard index, annual average $PM_{2.5}$ concentration, and acute hazard index thresholds at the project-level or community cumulative-level. Thus, the impact would be less than significant and no mitigation is required.

Mitigation Measure: None Required

IMPACT 4.3-5

d. Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Construction/Demolition, Including Transitional Phase: Less Than Significant, No Mitigation Proposed

Rodeo Refinery, Santa Maria Site, and Pipeline Sites

Decommissioning of petroleum processing equipment would involve venting and capture of gases and draining and recovery of liquids. These steps could result in some fugitive releases of odorous compounds; however, such release would be singular events for a particular equipment item, and releases would permanently cease upon completion of work. Therefore, it is not expected that potential and short-term odors would adversely affect a large number of people during construction and demolition activities at all Project sites. The impact would be less than significant.

Operation and Maintenance: Less-than-Significant Impact with Mitigation

Rodeo Refinery

Under existing conditions, some substances present in products and byproducts of the petroleum crude oil refining processes and in materials used by the Rodeo Refinery, the Santa Maria Site, and the Pipeline Sites are known to cause odors, such as H_2S, SO_2, and other reduced-sulfur compounds (e.g., mercaptans), ammonia, and some organic compounds, including benzene, naphthalene, and toluene. The elimination of crude oil throughput and refining of petroleum-based feedstocks during the Project would result in a substantial reduction of sulfur compounds and would therefore likely have a beneficial impact on emissions associated with common refinery odors. Conversely, under the Project, the Rodeo Facility would be converted to production of transportation fuels from renewable feedstocks as refining of petroleum feedstocks would be discontinued. Compared to a typical petroleum refinery, the new renewable feedstocks do not contain many of the sulfur and organic compounds that typically cause refinery type odor concerns. However, the renewable feedstocks can create odors similar to an animal and/or food processing facility unless properly managed through good engineering practices during project development combined with an Odor Management Plan after Project completion. These principles are currently used at the Rodeo Refinery and will continue after the completion of the Project.

The key element of controlling odors is to engineer control measures 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.

For the Project, the primary areas where engineering controls for controlling odors are being designed include Tank 100, where renewable feedstocks are unloaded from rail terminal and at the PTU. This equipment would handle and store the feedstocks prior to treatment.

Odor control at the railcar unloading racks includes a sealed header system tied to activated carbon canisters. 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. A simplified Block Flow Diagram for the system is shown in Figure 4.3-3, followed by a discussion of how the system abates odors.

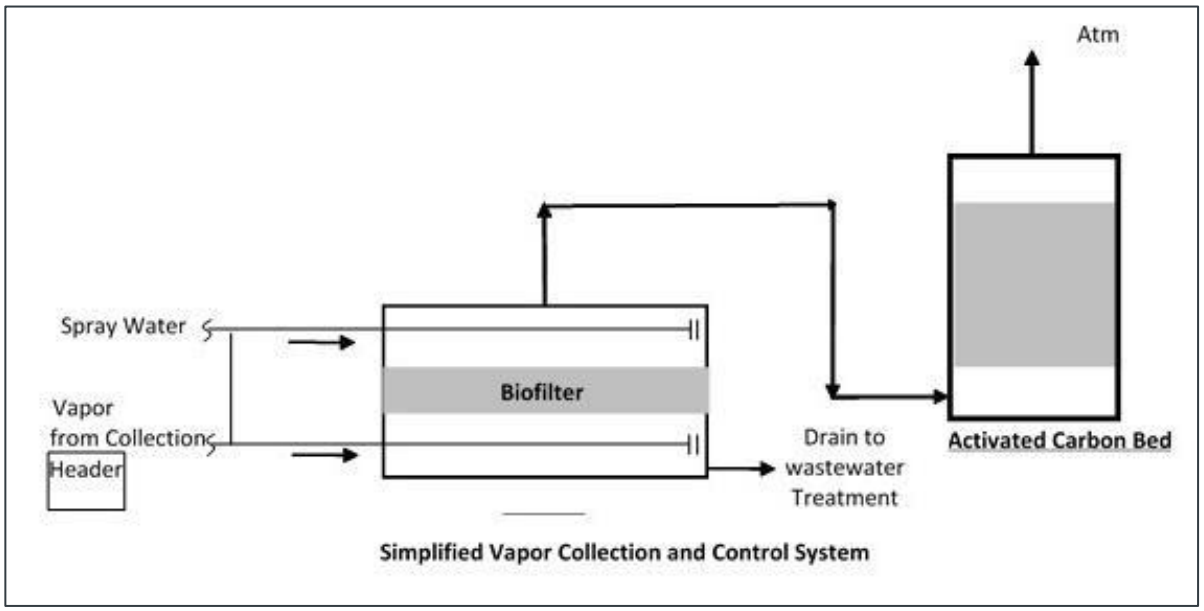


Figure 4.3-3 Simplified Vapor Collection and Control System

The system would withdraw vapors from the head space of all ambient liquid tanks/vessels in the PTU that could have potential odor-causing vapors. Equipment operated under vacuum would also have the vapor discharged from the vacuum blowers and directed to the biofilter and activated carbon for odorous constituent removal.

The biofilter uses microorganisms to degrade organic constituents in the vapor into odor-free CO_2 and water. The biofilter contains media allowing for the growth of microorganisms which degrade odor causing constituents. The media can be compost peat, wood chips, tree bark, or proprietary materials supplied by the biofilter provider. The media provides a large surface area, nutrients, and moisture for microbial activities and adsorption of odorous molecules. The treated vapor would be discharged from the nozzle located at the upper section of the biofilter to the activated carbon bed for further treatment. A water seal design provided on the biofilter drain would prevent the release of untreated vapor. This biofilter technology is widely accepted for its high performance in both industrial and municipal applications.

The activated carbon beds used to remove odorous constituents from vapor streams are designed to provide sufficient abatement alone; however the proposed 2-stage system with biofilter and activated carbon bed would provide odor abatement during steady-state operations that minimizes the generation of solid waste. This design also allows for maintenance activities at the biofilter with redundancy to minimize odors during those periods.

Impact Summary

Construction and operational emissions of petroleum-based odorous gases such as H_2S, SO_2, other reduced-sulfur compounds, ammonia, and certain organic compounds would permanently cease upon completion of the conversion to renewable fuels processing. The project includes equipment to minimize potential odors associated with processing renewable feedstocks. However, organic-based odorous gases, although generally less potent than petroleum-based odorous gases, could be emitted from the repurposed facility from time-to-time. This would be significant impact. Mitigation Measure AQ-4 requires implementation of an Odor Management Plan. With implementation of Mitigation Measure AQ-4, odor impacts would be less than significant.

Mitigation Measure AQ-4: Implement Odor Management Plan

During the 2-year construction phase of the Project, an Odor Management Plan (OMP) shall be developed and implemented upon commencement of the renewable fuels processes, which will become an integrated part of daily operations at the Rodeo Refinery. The purpose of the OMP is to prevent any offsite odors and effect diligent identification and remediation of any potential odors generated by the Project. The OMP shall outline equipment that is in place and procedures that facility personnel shall use to address odor issues, facility wide. The OMP would include evaluation of the overall system performance, identifying any trends to provide an opportunity for improvements to the plan, and updating the odor management and control strategies, as necessary. This plan would be retained at the facility for County or other government agency inspection upon request.

4.3.10 References

BAAQMD (Bay Area Air Quality Management District). 2010. CEQA Air Quality Guidelines. Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/%20Draft_BAAQMD_CEQA_Guidelines_May_2010_Final.ashx. Accessed March 2021.

———. 2011. CEQA Air Quality Guidelines. Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en. Accessed March 2021.

———. 2017a. Air Quality Standards and Attainment Status. Available at: https://www.baaqmd.gov/about-air-quality/research-and-data/air-quality-standards-and-attainment-status. Accessed August 3, 2021.

———. 2017b. BAAQMD CEQA Air Quality Guidelines. Final. May. Available at: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines. Accessed March 16, 2021.

———. 2017c. Spare the Air–Cool the Climate: Clean Air Plan. Adopted April 19. Available at: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed March 16, 2021.

———. 2018. Bay Area Air Pollution Summary, 2017. Available at: https://www.baaqmd.gov/~/media/files/communications-and-outreach/annual-bay-area-air-quality-summaries/pollsum2017-pdf.pdf?la=en. Accessed April 27, 2021.

———. 2019. Bay Area Air Pollution Summary, 2018. Available at: https://www.baaqmd.gov/~/media/files/communications-and-outreach/annual-bay-area-air-quality-summaries/pollsum2018-pdf.pdf?la=en. Accessed April 27, 2021.

———. 2020. Bay Area Air Pollution Summary, 2019. Available at: https://www.baaqmd.gov/~/media/files/communications-and-outreach/annual-bay-area-air-quality-summaries/pollsum2019-pdf.pdf?la=en. Accessed April 27, 2021.

———. 2021. 2013–2017 ConocoPhillips Rodeo Meteorological Station (CP Rodeo Met Station). Available at: https://www.baaqmd.gov/plans-and-climate/emission-tracking-and-monitoring/fenceline-monitoring-plans.

California Air Pollution Control Officers Association. 2009. Health Risk Assessments for Proposed Land Use Projects. July.

CARB (California Air Resources Board). 2007. Emissions Estimation Methodology for Commercial Harbor Craft Operating in California. Available at: https://ww3.arb.ca.gov/msei/chc-appendix-b-emission-estimates-ver02-27-2012.pdf. Accessed June 2021.

———. 2009. Methodology for Estimating Premature Deaths Associated with Long-Term Exposures to Fine Airborne Particulate Matter in California Draft Staff Report. December 7, 2009. Available at: http://www.arb.ca.gov/research/health/pm-mort/pm-mortdraft.pdf. Accessed May 29, 2013.

———. 2011. Emissions Estimation Methodology for Ocean-Going Vessels. Available at: https://ww2.arb.ca.gov/sites/default/files/classic/regact/2011/ogv11/ogv11appd.pdf. Accessed June 2021.

———. 2017. 2016 Line haul Locomotive Model & Update: Off Road Diesel Analysis Section. Available at: https://ww3.arb.ca.gov/msei/ordiesel/locolinehaul2017ei.docx. Accessed June 2021.

———. 2019. Update to Inventory for Ocean-Going Vessels at-Berth. Accessed June 2021 at https://ww3.arb.ca.gov/msei/offroad/pubs/2019_ogv_inventory_writeup_ver_oct_18_2019.pdf.

———. 2021a. Quality Assurance Air Monitoring Site Information for Nipomo-Guadalupe Road Web Page. Available at: https://www.arb.ca.gov/qaweb/iframe_site.php?s_arb_code=40849. Accessed August 15, 2021.

———. 2021b. Wind Rose and Pollution Rose Diagrams. Available at: https://ww2.arb.ca.gov/resources/fact-sheets/wind-rose-and-pollution-rose-diagrams. Accessed August 3, 2021.

Centerline. 2021. Centerline Harbor Craft Fleet Website. Available at: https://www.centerlinelogistics.com/fleet. Accessed May 2021.

Contra Costa County. 2015. Climate Action Plan. Available at: https://www.contracosta.ca.gov/DocumentCenter/View/39791/Contra-Costa-County-Climate-Action-Plan. Accessed March 16, 2021.

Federal Register. 2018a. Additional Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards. US Environmental Protection Agency. *Federal Register* 83 (107): 25776–25848.

———. 2018b. Air Quality Designations for the 2010 Sulfur Dioxide (SO2) Primary National Ambient Air Quality Standard—Round 3. US Environmental Protection Agency. *Federal Register* 83 (6): 1098–1172.

IHS Markit. 2018. Maritime Portal Desktop. Available at: https://ihsmarkit.com/products/maritime-portal-desktop.html.

OEHHA (Office of Environmental Health Hazard Assessment). 2015. Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February. Available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed April 27, 2021.

Ramboll. 2021. Rodeo Renewed Project Air Quality Technical Report. Prepared for Phillips 66. June.

San Joaquin Valley APCD (Air Pollution Control District). 2015. Air Quality Thresholds of Significance. Available at: http://www.valleyair.org/transportation/0714-GAMAQI-Criteria-Pollutant-Thresholds-of-Significance.pdf/. Accessed May 2021.

Santa Barbara County APCD (Air Pollution Control District). 2020. Significance Thresholds. Frequently Asked Questions. Available at: https://www.ourair.org/apcd/land-use-frequently-asked-questions/#grading. Accessed May 2021.

San Luis Obispo County APCD (Air Pollution Control District). 2010. South County Phase 2 Particulate Study. February. Available at: https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/PM2-final_report_with_appendices.pdf. Accessed March 2021.

———. 2012. CEQA Air Quality Handbook. April. Available at: https://www.prcity.com/DocumentCenter/View/14604/CEQA-Air-Quality-Handbook---2012-Volume-1-PDF. Accessed March 2021.

———. 2020. Annual Air Quality Report, 2019. Available at: https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2019aqrt-FINAL.pdf. Accessed March 2021.

Starcrest Consulting Group. 2019. San Pedro Bay Ports Emissions Inventory Methodology Report. Available at: https://kentico.portoflosangeles.org/getmedia/3559520c-b85d-45ad-ad68-9947c34b980d/WV_FINAL_SPBP_Emissions_Inventory-_Methodology_4-25-19_scg.

Union Pacific Railroad Company. 2019. Class I Railroad Annual Report R-1. Available at: https://www.up.com/cs/groups/public/@uprr/@investor/documents/investordocuments/pdf_up_r1_2019.pdf.

USEPA (US Environmental Protection Agency). 2021. Green Book. Available at: https://www.epa.gov/green-book. Accessed April 16, 2021.

Yorke Engineering, LLC. 2019. Phillips 66 Propane Recovery Project Rail Transport Emissions Update and Health Risk Assessment. Prepared for Contra Costa County Department of Conservation and Development.

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