3.6 Greenhouse Gas Emissions

3.6.1 Introduction

This section evaluates the potential for the proposed project to result in adverse impacts related to greenhouse gas (GHG) emissions. The analysis is based on review of available GHG reports, the relevant regulatory ordinances, and a discussion of the methodology and thresholds used to determine whether the proposed project would result in significant impacts. This section analyzes the potential for both project-level and cumulative environmental impacts.

Data used in this section includes information obtained from the *Greenhouse Gas Assessment for the Los Cerritos Wetlands Oil Consolidation and Restoration Project* (Greve & Associates 2017 [Appendix B3]) and the *Los Cerritos Wetlands Oil Consolidation and Restoration Project Greenhouse Gas Mitigation White Paper* (BOMP 2017 [Appendix B4]). All information sources used are included as citations within the text; sources are listed in Section 3.6.5, References.

3.6.2 Environmental Setting

3.6.2.1 Climate

The proposed project is located in the County of Los Angeles and within the South Coast Air Basin, which has a distinctive climate determined by its terrain and geographic location. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The usually mild climate is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds.

3.6.2.2 Climate Change Overview

Gases that trap heat in the atmosphere are called GHGs. The major concern with GHGs is that increases in their concentrations are causing global climate change. Global climate change is a change in the average weather on Earth that can be measured by wind patterns, storms, precipitation, and temperature. Although there is disagreement as to the rate of global climate change and the extent of the impacts attributable to human activities, the scientific community agrees that there is a direct link between increased emissions of GHGs and long-term global temperature increases.

State law defines GHGs as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). Because different GHGs have different global warming potentials (GWPs) and CO₂ is the most common reference gas for climate change, GHG emissions are often quantified and reported as CO₂ equivalents (CO₂e). For example, CH₄ has a GWP of 25 (over a 100-year period); therefore, 1 metric ton (MT) of CH₄ is equivalent to 25 metric tons of CO₂ equivalents (MTCO₂e). The GWP ratios for the defined GHGs are available from the United Nations Intergovernmental Panel on Climate Change (IPCC) and are published in the *Fourth Assessment Report* (AR4)
(IPCC 2007). By applying the GWP ratios, project-related \( \text{CO}_2 \) emissions can be tabulated in metric tons per year. Large emission sources are reported in million metric tons (MMT) of \( \text{CO}_2 \).\(^{44}\)

Some of the potential effects in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more forest fires, and more drought years (CARB 2008). Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC 2001):

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- More intense precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.

In June 2017, the California Air Resources Board (CARB) released the 2017 edition of the California GHG inventory covering calendar year 2015 emissions. In 2015, California emitted 440.4 MMT\( \text{CO}_2 \) including from imported electricity. Combustion of fossil fuel in the transportation sector was the single largest source of California’s GHG emissions in 2015, accounting for approximately 37 percent of total GHG emissions in the state. This sector was followed by the industrial sector (21 percent) and the electric power sector (including both in-state and out-of-state sources) (19 percent) (CARB 2017a).

Impacts of GHGs are borne globally, as opposed to localized air quality effects of criteria air pollutants and toxic air contaminants. The quantity of GHGs that it takes to ultimately result in climate change impacts is not precisely known; however, it is clear that the quantity is enormous, and no single project would measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or microclimates. From the standpoint of CEQA, as recognized by the California Air Pollution Control Officers Association (CAPCOA), GHG impacts to global climate change are inherently cumulative (CAPCOA 2008).

### 3.6.2.3 Greenhouse Gas Emissions Sources

According to much of the scientific literature on this topic, emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural sectors. As mentioned previously, in California the transportation sector is the largest emitter of GHGs, followed by industrial processes (CARB 2017a). Emissions of \( \text{CO}_2 \) are by-products of fossil fuel combustion. \( \text{CH}_4 \), a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure

\(^{44}\) A metric ton is 1,000 kilograms; it is equal to approximately 1.1 U.S. tons and approximately 2,204.6 pounds.
conditions) and is largely associated with agricultural practices and landfills. N₂O is also largely attributable to agricultural practices and soil management. CO₂ sinks, or reservoirs, include vegetation and the ocean, which absorb CO₂ through sequestration and dissolution, respectively, and are two of the most common processes of CO₂ sequestration.

3.6.3 Regulatory Framework

3.6.3.1 Federal

On December 7, 2009, the USEPA Administrator made two distinct findings regarding GHGs under federal Clean Air Act (CAA) Section 202(a). The USEPA adopted a Final Endangerment Finding for the six defined GHGs: CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆. The Endangerment Finding is required before USEPA can regulate GHG emissions under CAA Section 202(a)(1). The USEPA also adopted a Cause or Contribute Finding in which the USEPA Administrator found that GHG emissions from motor vehicle and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. These findings do not themselves impose any requirements on industry or other entities; however, these actions were a prerequisite for implementing GHG emissions standards for vehicles.

On May 19, 2009, the president announced a national policy for fuel efficiency and emissions standards in the United States auto industry. The standards were jointly adopted by the USEPA and United States Department of Transportation (USDOT) in 2010 and apply to passenger cars and light-duty trucks for model years 2012 through 2016. The rule surpasses the prior Corporate Average Fuel Economy (CAFE) standards and requires an average fuel economy standard of 35.5 miles per gallon (mpg) and 250 grams of CO₂ per mile by model year 2016, based on USEPA calculation methods. In August 2012, standards were adopted for model year 2017 through 2025 passenger cars and light-duty trucks. By 2025, vehicles are required to achieve 54.5 mpg (if GHG reductions are achieved exclusively through fuel economy improvements) and 163 grams of CO₂ per mile. According to the USEPA, a model year 2025 vehicle would emit one-half of the GHG emissions from a model year 2010 vehicle (USEPA 2012).

In September 2011, USEPA and the National Highway Traffic Safety Administration (NHTSA) developed a program designed to reduce fuel consumption (and GHG emissions by association) from medium- and heavy-duty vehicles. Phase 1 of the Heavy Duty Vehicle Greenhouse Gas Regulation National Program was directed at model year 2014 to 2018 vehicles and requires up to a 10 percent reduction in CO₂ emissions by model year 2017 over the 2010 baseline, which is projected to reduce GHG emissions by approximately 270 million metric tons. In February 2014, the president directed the USEPA and NHTSA to extend the Heavy-Duty National Program beyond vehicle model year 2018, to further reduce fuel consumption through the application of advanced technologies. The USEPA and the NHTSA, in collaboration with CARB, issued a notice of proposed rulemaking in June 2015. The Phase 2 standards start in model year 2021 and require the phase-in of a 12 to 24 percent reduction in CO₂ emission reduction from diesel vehicles by model year 2027 over the 2017 baseline (USEPA 2016). CARB has stated that it intends to propose a more stringent California Phase 2 program in late 2017 to achieve additional GHG reductions over the federal standards in order to meet the State’s GHG emissions reduction goals (CARB 2017b). Requirements of this program apply to heavy- and medium-duty trucks used during proposed construction activities.
Other specific GHG regulations that USEPA has adopted to-date are as follows:

**40 CFR Part 98. Mandatory Reporting of Greenhouse Gases Rule.** This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO₂e emissions per year (USEPA 2013). Additionally, reporting of emissions is required for owners of SF₆- and PFC-insulated equipment when the total nameplate capacity of these insulating gases is above 17,280 pounds.

**40 CFR Part 52. Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule.** USEPA recently mandated to apply Prevention of Significant Deterioration (PSD) requirements to facilities whose stationary source CO₂e emissions exceed 75,000 tons per year (USEPA 2010).

### 3.6.3.2 State

In response to growing scientific and political concern regarding global climate change, in the last decade California has promulgated a series of executive orders, laws, and regulations aimed at reducing both the level of GHGs in the atmosphere and emissions of GHGs from commercial and private activities within the State.

**California Air Resources Board**

The CARB is a part of the California Environmental Protection Agency (Cal/EPA) responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, establishes the California Ambient Air Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB has primary responsibility for the development of California’s State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts. The SIP is required for the State to take over implementation of the federal CAA.

In 2004, CARB adopted an Airborne Toxic Control Measure (ACTM) to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other toxic air contaminants (TACs) (Title 13 California Code of Regulations, Section 2485). The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. This measure generally does not allow diesel-fueled commercial vehicles to idle for more than 5 minutes at any given location with certain exemptions for equipment in which idling is a necessary function such as concrete trucks. While this measure primarily targets diesel particulate matter emissions, it has co-benefits of minimizing GHG emissions from unnecessary truck idling.

In 2008, CARB approved the Truck and Bus regulation to reduce particulate matter and nitrogen oxide emissions from existing diesel vehicles operating in California. CARB has also promulgated emission standards for off-road diesel construction equipment of greater than 25 horsepower (hp) such as bulldozers, loaders, backhoes and forklifts, as well as many other self-propelled off-road diesel vehicles. The regulation adopted by the CARB on July 26, 2007, aims to reduce emissions by installation of diesel soot filters and encouraging the retirement, replacement, or repower of older, dirtier engines with newer emission controlled models. Refer to Section 3.2, Air Quality, for additional details regarding these regulations. While these regulations primarily target reductions in criteria air pollutant emission, they have co-benefits of minimizing GHG emissions due to improved engine efficiencies.
California Greenhouse Gas Reduction Targets

The governor announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets:

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and
- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

In accordance with Executive Order S-3-05, the Secretary of Cal/EPA is required to coordinate efforts of various agencies, which comprise the California Climate Action Team (CAT), in order to collectively and efficiently reduce GHGs. These agencies include CARB, the Secretary of the Business, Transportation and Housing Agency, Department of Food and Agriculture, the Resources Agency, the California Energy Commission, and the Public Utilities Commission. The CAT provides periodic reports to the governor and legislature on the state of GHG reductions in the state as well as strategies for mitigating and adapting to climate change. The first CAT Report to the governor and the legislature in 2006 contained recommendations and strategies to help meet the targets in Executive Order S-3-05. The 2010 CAT Report, finalized in December 2010, expands on the policies in the 2006 assessment. The new information detailed in the CAT Report includes development of revised climate and sea-level projections using new information and tools that became available and an evaluation of climate change within the context of broader social changes, such as land-use changes and demographic shifts.

On April 29, 2015, Governor Brown issued Executive Order B-30-15. Therein, the governor directed the following:

- Established a new interim statewide reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030;
- Ordered all state agencies with jurisdiction over sources of GHG emissions to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 reduction targets; and
- Directed CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent.


In 2006, the California State Legislature adopted Assembly Bill (AB) 32 (codified in the California Health and Safety Code [HSC], Division 25.5, California Global Warming Solutions Act of 2006), which focuses on reducing GHG emissions in California to 1990 levels by 2020. HSC Division 25.5 defines GHGs as CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ and represents the first enforceable statewide program to limit emissions of these GHGs from all major industries with penalties for noncompliance. The law further requires that reduction measures be technologically feasible and cost effective. Under HSC Division 25.5, CARB has the primary responsibility for reducing GHG emissions. CARB is required to adopt rules and regulations directing state actions that would achieve GHG emissions reductions equivalent to 1990 statewide levels by 2020.

As required by HSC Division 25.5, CARB approved the 1990 GHG emissions inventory, thereby establishing the emissions limit for 2020. CARB has determined the target, based on GWP values from the IPCC AR4, for
the 1990 GHG emissions inventory and 2020 GHG emissions limit is 431 MMTCO\textsubscript{2}e. CARB updated the State’s projected 2020 emissions estimate to account for the effect of the 2007–2009 economic recession, new estimates for future fuel and energy demand, and the reductions required by regulation that were recently adopted for motor vehicles and renewable energy. CARB’s updated 2020 emissions projection using the GWP values from the IPCC AR4 is 509.4 MMTCO\textsubscript{2}e. Therefore, the emission reductions necessary to achieve the 2020 emissions target of 431 MMTCO\textsubscript{2}e would be 78.4 MMTCO\textsubscript{2}e, or a reduction of GHG emissions by approximately 15.4 percent. CARB has also projected emissions for the 2030 emissions target of 40 percent below 1990 levels, using a different baseline that takes into account 2020 GHG reduction policies and programs. A summary of the GHG emissions reductions required under HSC Division 25.5 is provided in Table 3.6-1, Estimated Greenhouse Gas Emissions Reductions Required by Health and Safety Code (HSC) Division 25.5.

### Table 3.6-1  Estimated Greenhouse Gas Emissions Reductions Required by Health and Safety Code (HSC) Division 25.5

<table>
<thead>
<tr>
<th>Emissions Scenario</th>
<th>GHG Emissions (MMTCO\textsubscript{2}e)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2008 Scoping Plan (IPCC SAR)</strong></td>
<td></td>
</tr>
<tr>
<td>2020 BAU Forecast (CARB 2008 Scoping Plan Estimate)</td>
<td>596</td>
</tr>
<tr>
<td>2020 Emissions Target Set by HSC Division 25.5 (i.e., 1990 Level)</td>
<td>427</td>
</tr>
<tr>
<td>Reduction below BAU Necessary to Achieve 1990 Levels by 2020</td>
<td>169 (28.4%)a</td>
</tr>
<tr>
<td><strong>2011 Scoping Plan (GHG Estimates Updated in 2014 to Reflect IPCC AR4 GWPs)</strong></td>
<td></td>
</tr>
<tr>
<td>2020 BAU Forecast (CARB 2011 Scoping Plan Estimate)</td>
<td>509.4</td>
</tr>
<tr>
<td>2020 Emissions Target Set by HSC Division 25.5 (i.e., 1990 Level)</td>
<td>431</td>
</tr>
<tr>
<td>Reduction below BAU Necessary to Achieve 1990 Levels by 2020</td>
<td>78.4 (15.4%)b</td>
</tr>
<tr>
<td><strong>2017 Scoping Plan Update (Note: CARB has not yet set a date for adoption of the Plan)</strong></td>
<td></td>
</tr>
<tr>
<td>2030 BAU Forecast (“Reference Scenario” which includes 2020 GHG reduction policies and programs)</td>
<td>392</td>
</tr>
<tr>
<td>2030 Emissions Target Set by HSC Division 25.5 (i.e., 40% below 1990 Level)</td>
<td>260</td>
</tr>
<tr>
<td>Reduction below BAU Necessary to Achieve 40% below 1990 Level by 2030</td>
<td>132 (33.7%)c</td>
</tr>
</tbody>
</table>

**SOURCE:** CARB, 2011, 2017c, 2017d.

a. \(\frac{596 - 427}{596} = 28.4\%\)

b. \(\frac{509.4 - 431}{509.4} = 15.4\%\)

c. \(\frac{392 - 260}{392} = 33.7\%\)

In 2016, the California State Legislature adopted Senate Bill (SB) 32 and its companion bill AB 197; both were signed by Governor Brown. SB 32 and AB 197 amends HSC Division 25.5 and establishes a new climate pollution reduction target of 40 percent below 1990 levels by 2030 and includes provisions to ensure the benefits of state climate policies reach into disadvantaged communities. CARB is in the process of preparing the second update to the Scoping Plan to reflect the 2030 target established in Executive Order B-30-15 and SB 32. The 2017 Scoping Plan Update discusses a Proposed Scenario and four alternatives. CARB states that the Proposed Scenario “is the clear choice to achieve the State’s climate and clean air goals” (CARB 2017c). Under the Proposed Scenario, the majority of the reductions would result from continuation of the Cap-and-Trade regulation. Additional reductions are achieved from requiring 20 percent reduction of GHG emissions from the refinery sector, electricity sector standards (i.e., 50 percent renewable electricity by 2030), doubling the energy efficiency savings at end uses, additional reductions from the Low Carbon Fuel Standard (LCFS), implementing the short-lived GHG strategy (e.g., hydrofluorocarbons), and implementing the mobile source strategy and
sustainable freight action plan. The alternatives are designed to consider various combinations of these programs as well as consideration of a carbon tax in the event the Cap-and-Trade regulation is not continued.

Continuation of the Cap-and-Trade regulation (or carbon tax) is expected to cover approximately 34 to 76 percent of the 2030 reduction obligation (CARB 2017c). Under the Proposed Scenario, the short-lived GHG strategy is expected to cover approximately 13 to 26 percent. The Renewables Portfolio Standard with 50 percent renewable electricity by 2030 is expected to cover approximately 10 to 11 percent. The mobile source strategy and sustainable freight action plan includes maintaining the existing vehicle GHG emissions standards, increasing the number of zero emission vehicles and improving the freight system efficiency, and is expected to cover approximately 9 to 11 percent. The refinery measure is expected to cover approximately 2 to 4 percent and the expansion of the LCFS is expected to cover approximately 3 percent. The other strategies would be expected to cover the remaining percentage of the 2030 reduction obligation.

**Oil and Gas Sector**

On March 23, 2017, CARB adopted regulations for the Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities (“Methane Regulations”) which is expected to go into effect between 2018 and 2020. The Methane Regulations impose emission controls on oil production and processing facilities, natural gas compressor stations, underground storage facilities, and gathering and boosting stations. Notable measures required under the regulation are minimizing venting emissions from circulation tanks, minimizing the duration of liquid circulation, and controlling vented and fugitive emissions. The purpose of this regulation is to assist the State in meeting the GHG emissions standards set under HSC Division 25.5.

**Transportation Sector**

In response to the transportation sector accounting for a large percentage of California’s CO₂ emissions, AB 1493 (HSC Section 42823 and 43018.5), enacted on July 22, 2002, required CARB to set GHG emission standards for passenger vehicles, light duty trucks, and other vehicles whose primary use is non-commercial personal transportation manufactured in and after 2009. In setting these standards, CARB must consider cost effectiveness, technological feasibility, economic impacts, and provide maximum flexibility to manufacturers. The federal CAA ordinarily preempts state regulation of motor vehicle emission standards; however, California is allowed to set its own standards with a federal CAA waiver from the USEPA. In June 2009, the USEPA granted California the waiver.

However, as discussed previously, the USEPA and USDOT adopted federal standards for model year 2012 through 2016 light-duty vehicles (referred to as the Pavley Phase I standards). The state standards require additional reductions in CO₂ emissions beyond model year 2016 (referred to as the Pavley Phase II standards). Also as noted above, the USEPA and USDOT have adopted GHG emission standards for model year 2017 through 2025 vehicles. These standards are slightly different from the Pavley Phase II standards, but the State of California has agreed not to contest these standards, in part due to the fact that while the national standard would achieve slightly less reductions in California, it would achieve greater reductions nationally and is stringent enough to meet state GHG emission reduction goals. In 2012, CARB adopted regulations that allow manufacturers to comply with the 2017–2025 national standards to meet state law.

In January 2007, Governor Brown enacted Executive Order S-01-07, which mandates the following: (1) establish a statewide goal to reduce the carbon intensity of California’s transportation fuels by at least 10 percent by 2020 and (2) adopt an (LCFS) for transportation fuels in California. CARB identified the LCFS
as one of the nine discrete early actions in the Climate Change Scoping Plan. The LCFS regulations were approved by CARB in 2009 and established a reduction in the carbon intensity of transportation fuels by 10 percent by 2020 with implementation beginning on January 1, 2011. The LCFS allows oil producers to develop their own low carbon fuel alternatives, or obtain allowances and offsets from other companies that produce low carbon alternatives such as biofuels, natural as, or hydrogen. In September 2015, CARB approved the re-adoption of the LCFS, which became effective on January 1, 2016, to address procedural deficiencies in the way the original regulation was adopted. In April 2017, the LCFS was brought before the Court of Appeal challenging the analysis of potential nitrogen dioxide impacts from biodiesel fuels. The court directed CARB to conduct an analysis of nitrogen dioxide impacts from biodiesel fuels and froze the carbon intensity targets for diesel and biodiesel fuel provisions at 2017 levels until CARB has completed this analysis, which CARB has indicated is expected to occur in 2018 (POET, LLC et al. v. State Air Resources Board et al.).

**Energy Sector**

Established in 2002 under SB 1078, accelerated in 2006 under SB 107, and expanded in 2011 under SB 2, California's Renewables Portfolio Standard is an ambitious renewable energy standard. The Renewables Portfolio Standard requires that 33 percent of total retail sales of electricity be procured from eligible renewable sources by the end of 2020. Renewables Portfolio Standard requirements were conservatively excluded from emission calculations associated with electricity use. Although not directly applicable to the proposed project, this serves to illustrate the GHG regulatory framework.

SB 1368 was signed by Governor Schwarzenegger in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a GHG emission performance standard for baseload generation from investor-owned utilities. CPUC adopted a GHG Emissions Performance Standard in January 2007. The California Energy Commission (CEC) adopted consistent regulations for implementing and enforcing SB 1368 for the state’s publicly owned utilities in August 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural-gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

SB 97, enacted in 2007, directed the state Office of Planning and Research to develop CEQA Guidelines “for the mitigation of GHG emissions or the effects of GHG emissions.” In December 2009, the Office of Planning and Research adopted amendments to the CEQA Guidelines Appendix G, Environmental Checklist, which created a new resource section for GHG emissions and indicated criteria that may be used to establish significance of GHG emissions. CEQA Guidelines Appendix F states that, in order to ensure that energy implications are considered in project decisions, the potential energy implications of a project shall be considered in an EIR, to the extent relevant and applicable to the project. Appendix F further states that a project’s energy consumption and proposed conservation measures may be addressed, as relevant and applicable, in the Project Description, Environmental Setting, and Impact Analysis portions of technical sections, as well as through mitigation measures and alternatives. In accordance with CEQA Guidelines Appendix F, relevant information that addresses the energy implications of the proposed project is provided in Section 3.18, Energy Consumption.

**Cap-and-Trade Program**

The Climate Change Scoping Plan identifies a Cap-and-Trade Program as one of the key strategies California will employ to reduce GHG emissions. CARB asserts that this program would help put California on the path to
meet its goal of reducing GHG emissions to 1990 levels by the year 2020, and ultimately achieving an 80 percent reduction from 1990 levels by 2050 (CARB 2016). CARB’s preferred path in its 2030 scoping plan is to continue the Cap-and-Trade program combined with an additional 20 percent reduction of greenhouse gases in the refinery sector (CARB 2017c, 31). Under Cap-and-Trade, an overall limit on GHG emissions from capped sectors is established and facilities subject to the cap would be able to trade permits to emit GHGs.

CARB designed and adopted a California Cap-and-Trade Program\(^{45}\) pursuant to its authority under AB 32. The development of this program included a multi-year stakeholder process and consideration of potential impacts on disproportionately impacted communities. The Cap-and-Trade Program is designed to reduce GHG emissions from major sources (deemed “covered entities”) by setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve AB 32’s emission-reduction mandate of returning to 1990 levels of emissions by 2020. The statewide cap for GHG emissions from the capped sectors\(^{46}\) (e.g., electricity generation, petroleum refining, and cement production) commenced in 2013 and would decline over time, achieving GHG emission reductions throughout the program’s duration.

Under the Cap-and-Trade Program, CARB issues allowances equal to the total amount of allowable emissions over a given compliance period and distributes these to regulated entities. Covered entities that emit more than 25,000 MTCO\(_2\)e per year must comply with the Cap-and-Trade Program.\(^ {47}\) Triggering of the 25,000 MTCO\(_2\)e/year “inclusion threshold” is measured against a subset of emissions reported and verified under the California Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (Mandatory Reporting Rule [MRR]).\(^ {48}\)

Each covered entity with a compliance obligation is required to surrender “compliance instruments”\(^{49}\) for each MTCO\(_2\)e of GHG they emit. Covered entities are allocated free allowances in whole or part (if eligible) and obtain allowances and offsets from other facilities as required. A “compliance period” is the time frame during which the compliance obligation is calculated. The 2-year period covering 2013 and 2014 was the first compliance period; the years 2015–2017 constitute the second compliance period; and the third compliance period is from 2018–2020 (CARB 2012). At the end of each compliance period, each facility is required to surrender compliance instruments to CARB that are equivalent to their total GHG emissions throughout the compliance period. There also are requirements to surrender compliance instruments covering 30 percent of the prior year’s compliance obligation by November of each year. For example, in November 2014, a covered entity was required to submit compliance instruments to cover 30 percent of its 2013 GHG emissions (CARB 2012).

The Cap-and-Trade Regulation provides a firm cap, ensuring that the 2020 statewide emission limit will not be exceeded. An inherent feature of the Cap-and-Trade Program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are only guaranteed on an aggregate basis. As summarized by CARB in its First Update to the Climate Change Scoping Plan:

*The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit*

\(^{45}\) 17 CCR Sections 95800 to 96023.

\(^{46}\) See generally 17 CCR Sections 95811 and 95812.

\(^{47}\) 17 CCR Section 95812.

\(^{48}\) 17 CCR Sections 95100–95158.

\(^{49}\) Compliance instruments are permits to emit, the majority of which will be “allowances,” but entities also are allowed to use CARB-approved offset credits to meet up to 8 percent of their compliance obligations.
more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances. **But as the cap declines, aggregate emissions must be reduced** (CARB 2014, p. 86).

In other words, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program; however, as climate change is a global phenomenon and the effects of GHG emissions are considered cumulative in nature, a focus on aggregate GHG emissions reductions is warranted.

Further, the reductions in GHG emissions that would be achieved by the Cap-and-Trade Program inherently are variable and, therefore, impossible to quantify with precision:

The Cap-and-Trade Regulation is different from most of the other measures in the Scoping Plan. The [R]egulation sets a hard cap, instead of an emission limit, so the emission reductions from the program vary as our estimates of “business as usual” emissions in the future are updated. In addition, the Cap-and-Trade Program works in concert with many of the direct regulatory measures—providing an additional economic incentive to reduce emissions. Actions taken to comply with direct regulations reduce an entity’s compliance obligation under the Cap-and-Trade Program. So, for example, increased deployment of renewable electricity sources reduces a utility’s compliance obligation under the Cap-and-Trade Regulation (CARB 2014, 86).

If California’s direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions reductions. If California’s direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will be responsible for relatively more emissions reductions. In other words, the Cap-and-Trade Program functions similarly to an insurance policy for meeting California 2020’s GHG emissions reduction mandate:

The Cap-and-Trade Program establishes an overall limit on GHG emissions from most of the California economy—the “capped sectors.” Within the capped sectors, some of the reductions are being accomplished through direct regulations, such as improved building and appliance efficiency standards, the [Low Carbon Fuel Standard] LCFS, and the 33 percent [Renewables Portfolio Standard] RPS. Whatever additional reductions are needed to bring emissions within the cap is accomplished through price incentives posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap (CARB 2014, 88).

[T]he Cap-and-Trade Regulation provides assurance that California’s 2020 limit will be met because the regulation sets a firm limit on 85 percent of California’s GHG emissions (CARB 2014, 86–87).

In sum, the Cap-and-Trade Program will achieve aggregate, rather than site-specific or project-level, GHG emissions reductions. Also, due to the regulatory architecture adopted by CARB under AB 32, the reductions attributed to the Cap-and-Trade Program can change over time, depending on the State’s emissions forecasts and the effectiveness of direct regulatory measures.

The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported.50 Accordingly, GHG emissions associated with CEQA projects’ electricity usage are covered by the Cap-and-Trade Program.

50 17 CCR Section 95811(b).
The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the program’s first compliance period.\(^{51}\) While the Cap-and-Trade Program technically covered fuel suppliers as early as 2012, those suppliers did not have a compliance obligation (i.e., they were not fully regulated) until 2015:

> Suppliers of natural gas, suppliers of RBOB [Reformulated Gasoline Blendstock for Oxygenate Blending] and distillate fuel oils, suppliers of liquefied petroleum gas, and suppliers of liquefied natural gas specified in sections 95811(c), (d), (e), (f), and (g) that meet or exceed the annual threshold in section 95812(d) will have a compliance obligation beginning with the second compliance period.\(^{52}\)

As of January 1, 2015, the Cap-and-Trade Program covered approximately 85 percent of California’s GHG emissions.

The Cap-and-Trade Program covers the GHG emissions associated with the combustion of transportation fuels in California, whether refined in-state or imported. The point of regulation for transportation fuels is when they are “supplied” (i.e., delivered into commerce); however, transportation fuels that are “supplied” in California, but can be demonstrated to have a final destination outside California, do not generate a compliance obligation. The underlying concept here is that CARB is seeking to capture tailpipe GHG emissions from the combustion of transportation fuels supplied to California end-users. Accordingly, as with stationary source GHG emissions and GHG emissions attributable to electricity use, virtually all, if not all, of GHG emissions from CEQA projects associated with vehicle combustion of transportation fuels are covered by the Cap-and-Trade Program.

**Low Carbon Fuel Standard**

In January 2007, Governor Brown enacted Executive Order S-01-07, which mandates the following: (1) establish a statewide goal to reduce the carbon intensity of California’s transportation fuels by at least 10 percent by 2020 and (2) adopt a Low Carbon Fuel Standard (LCFS) for transportation fuels in California. CARB identified the LCFS as one of the nine discrete early actions in the Climate Change Scoping Plan. The LCFS regulations were approved by CARB in 2009 and established a reduction in the carbon intensity of transportation fuels by 10 percent by 2020 with implementation beginning on January 1, 2011. In September 2015, CARB approved the re-adoption of the LCFS, which became effective on January 1, 2016, to address procedural deficiencies in the way the original regulation was adopted.

The LCFS allows petroleum producers to develop strategies for lowering their own carbon intensities in their products, or allows them to buy credits from other companies that sell lower carbon fuel alternatives. According to CARB, crude oil production and transport from the Seal Beach oil field (project-related oil field) has a carbon intensity factor of 5.08 g CO\(_2\)e per megajoule (g CO\(_2\)e/MJ) (BOMP 2017). This value is considerably lower than the state average of 11.98 g CO\(_2\)e/MJ and is, therefore, consistent with the LCFS (BOMP 2017).

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\(^{51}\) 17 CCR Sections 95811, 95812(d).

\(^{52}\) 17 CCR Section 95851(b) (emphasis added).
3.6.3.3 Regional

South Coast Air Quality Management District

The SCAQMD has developed many rules and regulations to regulate sources of air pollution in the SCAB and to help achieve air quality standards. Refer to Section 3.2, Air Quality, for a list of SCAQMD rules and regulations applicable to the project.

As a method for determining significance under CEQA, SCAQMD developed a draft tiered flowchart in 2008 for determining significance thresholds for GHGs for industrial projects where SCAQMD is acting as the lead agency. In December 2008, SCAQMD adopted a 10,000 MTCO\textsubscript{2}e/year threshold for industrial facilities, but only with respect to projects where SCAQMD is the lead agency. SCAQMD has not adopted a CEQA significance threshold, interim or otherwise, for GHG emissions associated with residential or commercial development.

Southern California Association of Governments

In February 2011, CARB adopted the GHG emissions reduction targets under SB 375 for the SCAG region. The target is a per capita reduction of 8 percent for 2020 and 13 percent for 2035 compared to the 2005 baseline. On April 7, 2016, SCAG adopted the 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Using growth forecasts and economic trends, the 2016 RTP/SCS provides a vision for transportation throughout the region for the next 25 years. It considers the role of transportation in the broader context of economic, environmental, and quality-of-life goals for the future, identifying regional transportation strategies to address mobility needs. The 2016 RTP/SCS successfully achieves and exceeds the GHG emission-reduction targets set by CARB by demonstrating an 8 percent reduction by 2020, 18 percent reduction by 2035, and 21 percent reduction by 2040 compared to the 2005 level on a per capita basis (SCAG 2016). Compliance with and implementation of 2016 RTP/SCS policies and strategies would have co-benefits of reducing per capita criteria air pollutant emissions associated with reduced per capita vehicle miles traveled (VMT). Strategies to reduce VMT include implementation of a “Complete Streets” policy that meets the needs of all users of the streets, roads and highways including bicyclists, children, persons with disabilities, motorists, electric vehicles, movers of commercial goods, pedestrians, users of public transportation, and seniors. In addition, the 2016 RTP/SCS includes strategies to promote active transportation, supports local planning and projects that serve short trips, expand understanding and consideration of public health in the development of local plans and projects, and supports improvements in sidewalk quality, local bike networks, and neighborhood mobility areas.

The SCAG 2016 RTP/SCS includes goals for reducing GHG emissions. The following goal would be applicable to the project:

**Goal 6:** Protect the environment and health of our residents by improving air quality and encouraging active transportation (e.g., bicycling and walking).

3.6.4 Analysis of Impacts

This section describes the impact analysis relating to greenhouse gas emissions for the proposed project. It describes the methods and applicable thresholds used to determine the impacts of the proposed project.
### 3.6.4.1 Significance Criteria

*CEQA Guidelines* Appendix G provides that a project would have a significant GHG emissions impact if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Amendments to *CEQA Guidelines* Section 15064.4 were adopted to assist lead agencies in determining the significance of the impacts of GHG emissions. Consistent with existing CEQA practice, Section 15064.4 gives lead agencies the discretion to determine whether to assess those emissions quantitatively or qualitatively. If a qualitative analysis is used, in addition to quantification, this section recommends certain qualitative factors that may be used in the determination of significance (i.e., extent to which the project may increase or reduce GHG emissions compared to the existing environment; whether the project exceeds an applicable significance threshold; and extent to which the project complies with regulations or requirements adopted to implement a reduction or mitigation of GHGs). The amendments do not establish a threshold of significance; rather, lead agencies are granted discretion to establish significance thresholds for their respective jurisdictions, including looking to thresholds developed by other public agencies, or suggested by other experts, such as CAPCOA, so long as any threshold chosen is supported by substantial evidence (see Section 15064.7(c)). The California Natural Resources Agency has also clarified that the *CEQA Guidelines* amendments focus on the effects of GHG emissions as cumulative impacts, and that they should be analyzed in the context of CEQA’s requirements for cumulative impact analysis (see Section 15064(h)(3)) (CNRA 2009, 11–13, 14, 16; Bryant 2009). The Governor’s Office of Planning and Research (OPR) released a technical advisory on CEQA and climate change that provided some guidance on assessing the significance of GHG emissions, and states that “lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice,” and that while “climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment” (OPR 2008). Furthermore, the technical advisory states that “CEQA authorizes reliance on previously approved plans and mitigation programs that have adequately analyzed and mitigated GHG emissions to a less-than-significant level as a means to avoid or substantially reduce the cumulative impact of a project” (OPR 2008).

As noted above, the increased concentration of GHGs in the atmosphere has been linked to global warming, which can lead to climate change. Construction and operation of the proposed project would incrementally contribute to GHG emissions along with past, present and future activities. As such, impacts of GHG emissions are analyzed here on a cumulative basis.

In 2015, the California Supreme Court considered the question of the analysis of greenhouse gas emissions in the context of CEQA (*Center for Biological Diversity v. Cal Dept. of Fish and Wildlife* [The Newhall Land and Farming Company, Real Party in Interest] [2015] 62 Cal.4th 204 [“Newhall Ranch”]). At issue in that case was the application of a threshold of significance that measured a proposed project’s GHG emissions against the emissions of a project that did not incorporate GHG emission reduction measures but simply would be developed pursuant to “business as usual” methods and features. In that decision, the Supreme Court discussed various options lead agencies may employ to determine the significance of GHG emissions. One option
identified by the court was the reliance on existing numerical thresholds of significance for greenhouse gas emissions. The discussion below examines the numeric threshold that has been identified by SCAQMD for industrial uses.

Another option identified by the Supreme Court that a lead agency may use to assess the significance of GHG emissions is whether a proposed project complies with regulatory programs designed to reduce GHG emissions from particular activities. As noted by the court, CEQA Guidelines state that GHG emissions “may be best analyzed and mitigated at a programmatic level” (CNRA 2009, 64) As discussed below, the GHG emissions from the gas turbines are required to be addressed through compliance with the State’s Cap and Trade Program, which is a statewide regulatory scheme to address GHG emissions from certain sectors and facilities, specifically, with respect to this project, the gas turbines used to generate on-site electricity.

Currently, while SCAQMD has issued proposed standards and guidelines, there is no adopted state or local standard for determining the cumulative significance of the proposed project’s GHG emissions on global climate change. In December 2008, the SCAQMD adopted a 10,000 MTCO₂e/year significance threshold for industrial facilities for projects in which the SCAQMD is the lead agency. Although SCAQMD has not formally adopted a significance threshold for GHG emissions generated by a proposed project for which SCAQMD is not the lead agency, or a uniform methodology for analyzing impacts related to GHG emissions on global climate change, in the absence of any industry-wide accepted standards, the SCAQMD’s significance threshold of 10,000 MTCO₂e/year for projects is the most relevant air district-adopted GHG significance threshold and is used as a benchmark for the proposed project. It should be noted that the SCAQMD’s significance threshold of 10,000 MTCO₂e/year for industrial projects is intended for long-term operational GHG emissions. The SCAQMD has developed guidance for the determination of the significance of GHG construction emissions that recommends that total emissions from construction be amortized over 30 years and added to operational emissions and then compared to the threshold (SCAQMD 2008). As discussed above, the SCAQMD has applied its 10,000 MTCO₂e/year significance threshold in such a way that GHG emissions covered by the Cap-and-Trade Program do not constitute emissions that must be measured against the threshold. However, for purposes of analysis in this EIR, the GHG emissions from the gas turbines that would be covered by the Cap-and-Trade Program are included in the operational emissions and are measured against this SCAQMD threshold.

3.6.4.2 Methodology

GHG emissions associated with the proposed project would result from the construction and operation of the Synergy Oil Field, City Property, Pumpkin Patch, and LCWA sites. Additionally, emissions would be produced from the ongoing well plugging and abandonment activities and implementation of turbines at the LCWA site. The emissions generated by these activities and other secondary sources have been estimated and compared to the applicable thresholds of significance recommended by SCAQMD.

53 For example, the SJVAPCD “determined that GHG emissions increases that are covered under CARB’s Cap-and-Trade regulation cannot constitute significant increases under CEQA …” (SJVAPCD 2014). Furthermore, the SCAQMD has taken this position in CEQA documents it has produced as a lead agency. The SCAQMD has prepared three Negative Declarations and one Draft EIR that demonstrate the SCAQMD has applied its 10,000 MTCO₂e/year significance threshold in such a way that GHG emissions covered by the Cap-and-Trade Program do not constitute emissions that must be measured against the threshold (SCAQMD 2014a, 2014b, 2014c, 2015).
Construction

Construction of the proposed project has the potential to generate temporary criteria pollutant emissions through the use of heavy-duty construction equipment, such as cranes and excavators, and through vehicle trips generated from worker trips, haul trucks, and vendor/material supply trucks traveling to and from the project area. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of construction activity, and prevailing weather conditions. The assessment of construction air quality impacts considers each of these potential sources of emissions.

Short-term construction-generated emissions of GHGs associated with the proposed project were modeled using the California Emissions Estimator Model (CalEEMod), Version 2016.3.1, as recommended by SCAQMD. Modeling was based on project-specific data, based on construction information provided by the Applicant. Modeling input and output files are provided in Appendix B3 of this Draft EIR.

The proposed project would phase out, over time, the existing oil production facilities from the Synergy Oil Field and City Property sites and establish two new oil production sites on the Pumpkin Patch and LCWA sites. Additionally, the proposed project would implement a wetlands rehabilitation project that would remediate and restore 76.52 acres of the northern portion of the Synergy Oil Field site. The overwhelming majority of construction activities would occur over a 4-year period with the gradual phase out and removal of oil wells and associated oil production infrastructure occurring over a 40-year period.

For purposes of this analysis, construction emissions were modeled as occurring during the 4 years of construction activities and were estimated using CalEEMod based on known project-specific details. Construction activities associated with construction would generate pollutant emissions from the following construction activities and phases: (1) demolition and site preparation; (2) construction of well cellars; (3) installation of process equipment; (4) construction of tanks; (5) off-site construction; (6) construction of office, warehouse, and parking lot; (7) wetland restoration; (8) turbine commissioning, which generally involves starting and stopping the turbine up to 10 times during the day and running the turbine for up to 20 hours to ensure proper functioning of the equipment (turbine commissioning would occur after most, if not all, of the other phases have been completed); and (9) potential landfill excavation and fill for an old existing landfill (household and construction waste) on the Pumpkin Patch site. The landfill excavation and fill may not be required and the timing of the activity is not yet known. It is possible the landfill excavation and fill could occur separately from the other phases of the project. Therefore, the landfill excavation and fill emissions are broken out separately.

Demolition and remediation and grading activities would occur mainly during Year 1 and spillover to the beginning of Year 2. These activities include pipeline removal and storage tank removal. Year 2 would consist of the installation of berms and tidal channels along with the removal of older channels and berms. Restoration would also begin in the northern restoration area. Restoration includes wetland grading, planting, irrigating, pest control, and trash removal. Additionally, the construction of non-oil facilities would begin in Year 2. By Year 3, it is anticipated that restoration work in the restoration area would be complete. During Year 3 and Year 4, construction of the non-oil facilities would occur. The wells on the Synergy Oil Field site would continue to be plugged and abandoned, restored, and revegetated. Emissions would be generated from worker and vendor vehicle trips, welding equipment, heavy-duty off-road construction equipment and other handwork construction equipment.
The Pumpkin Patch site currently has an old landfill that may need to be excavated to address site stability and high concentrations of contaminants. If excavated, the solid waste would be removed, and then replaced with clean imported soil. The excavated solid waste (consisting of both dry and wet material) would be transported to either an active landfill in either Simi Valley, Irwindale, and any contaminated soils would be transported to a Class I landfill, such as Kettleman. The landfill excavation and fill is incorporated into construction emissions estimates. GHG emissions associated with the construction and restoration would mainly result from the installation of process equipment and wetlands restoration efforts.

**Commissioning**

In addition to the construction activities described above, the commissioning of the turbines on the LCWA site would generate emissions on site. Commissioning involves starting and stopping the turbines up to 10 times per day and running the turbine for up to 20 hours. One turbine would be commissioned per day due to the complexity of the initial startup and operations. For purposes of this analysis, commissioning emissions are reported with the construction GHG emissions.

**Operation and Maintenance**

Operation and maintenance activities would consist of natural gas combustion for space heating, two diesel-powered drilling rigs,\(^{54}\) turbines located at LCWA, and other miscellaneous sources. Additional drilling rigs would be in operation at both the Pumpkin Patch and LCWA sites on a regular basis but would be electrically-powered by the turbines. The LCWA site would contain four gas turbine generator sets to convert natural gas from the wells to electricity and is the dominant source of GHG emissions on all four individual sites. Other GHG emissions would be generated by electricity consumption at the Synergy Oil Field site, electricity consumption at the Pumpkin Patch and LCWA sites when needed as a supplement to the turbines, and transportation fuel combustion from employee/worker travel to and from the site. Transportation fuel combustion may occur from oil truck trips\(^{55}\) that would haul the crude oil from the site to off-site refinery locations in the region, but only if the legacy wells are producing at capacity or if excess natural gas or residual petroleum requires off-site truck transport. For the purposes of this assessment, transportation fuel demand from oil truck trips are included in order to provide a conservative analysis.

The existing oil field well sites would be phased out over a 40-year period, starting upon the completion and occupation of the new office building and warehouse on the Pumpkin Patch site. The emissions associated with the assumed baseline oil operations would be reduced by 75 percent once building permits are obtained for the office building on the Pumpkin Patch site. Over the next 20 years, half of the existing 53 wells would be plugged and abandoned. This represents an 87.5 percent reduction from the assumed baseline emission levels. By Year 40, all wells would be plugged and abandoned, which would represent a 100 percent reduction of the baseline emissions.

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\(^{54}\) The project would include a total of two diesel-powered drilling rigs operating during daylight hours at the Pumpkin Patch and LCWA sites. A total of two electric-powered drilling rigs would be located on the Pumpkin Patch and LCWA sites and would utilize electricity generated from the turbines.

\(^{55}\) Oil haul would only occur for the original, legacy wells if they are producing at capacity, however, because the Applicant is reducing existing production by 75 percent, no oil haul trucking would be required. Some excess natural gas may be transported off site by truck along with residual petroleum.
Consistency with Greenhouse Gas Reduction Plans, Policies, and Regulations

The proposed project’s GHG emissions are also evaluated by assessing consistency with applicable GHG reduction strategies. As discussed previously, the GHG regulations have been adopted primarily at the federal and state levels to reduce emissions of GHGs from project sources, such as trucks and energy, under the Clean Air Act and the State’s GHG regulatory framework under HSC Division 25.5, in particular the Cap-and-Trade regulation. Impacts are evaluated based on consistency with these applicable regulations.

As stated in Chapter 1, Introduction, on April 28, 2016, the City sent an NOP to responsible, trustee, and federal agencies, as well as to organizations, and individuals potentially interested in the project to identify the relevant environmental issues that should be addressed in the EIR. No issues related to GHG were identified.

3.6.4.3 Impact Evaluation

Impact GHG-1: The proposed project would generate GHG emissions, either directly or indirectly, but would not result in a significant impact on the environment. (Less than Significant with Mitigation)

Emissions Calculations

Construction

Construction of the proposed project would generate GHG emissions from a variety of sources. First, GHG emissions would be generated during construction of the proposed projects in the project area. Once fully operational, the proposed projects’ operations would generate direct GHG emissions from mobile sources (i.e., worker commute trips and periodic facility maintenance visits). Indirect source emissions associated with operation of the proposed project would be generated from electrical consumption to power facilities and cars traveling to and from the visitors center on the Synergy Oil Field site. Table 3.6-2, Construction Emissions, presents the results of the emissions calculations for the construction and commissioning activities discussed above. Additionally, the emissions when amortized over a 30-year period are also shown. CalEEMod printouts are included in Appendix B3.

<table>
<thead>
<tr>
<th>Construction Phase</th>
<th>MTCO₂e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition/Site Preparation</td>
<td>466.1</td>
</tr>
<tr>
<td>Well Cellars</td>
<td>775</td>
</tr>
<tr>
<td>Process Equipment</td>
<td>1,032</td>
</tr>
<tr>
<td>Tank Construction</td>
<td>58</td>
</tr>
<tr>
<td>Off-Site Construction</td>
<td>333</td>
</tr>
<tr>
<td>Office/Warehouse</td>
<td>101</td>
</tr>
<tr>
<td>Wetlands Restoration</td>
<td>650</td>
</tr>
<tr>
<td>Turbine Commissioning</td>
<td>207</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>3,622</strong></td>
</tr>
<tr>
<td>Landfill Excavation</td>
<td>1,099</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,721</strong></td>
</tr>
<tr>
<td><strong>Amortized over 30 years (MTCO₂e/year)</strong></td>
<td><strong>157</strong></td>
</tr>
</tbody>
</table>

Operations

Operational air pollutant emissions due to the project were calculated using the CalEEMod program and spreadsheets. The program calculated operational emissions for the various phases of the proposed project. For the Pumpkin Patch site emission sources include cars and trucks going to and from the site, natural gas for space heating, a diesel-powered drilling rig, and other miscellaneous sources. The site would not normally consume electricity from the public grid, but rather electricity would be generated by turbines at the LCWA site.

Additional drilling rigs would be in operation on a regular basis at both the Pumpkin Patch and LCWA sites, but would be electric (not diesel powered). Also at both the Pumpkin Patch and LCWA sites would be diesel-powered workover drilling rigs. The workover rigs are anticipated to be approximately 500 hp and drill up to 12 hours per day. Oil-containing tanks would be permitted through SCAQMD and equipped with BACT (best available control technology). Tanks at both Pumpkin Patch and LCWA sites would be fixed-roof gas blanket design, which eliminates the direct emissions from tanks. A flare system and an emergency generator would be located at the LCWA site, but would only be used in emergencies and, therefore, are not included in the emission projections. At the LCWA site there would be four gas turbine generator sets to convert natural gas from the wells to electricity. Currently, it is envisioned that these generators would provide all of the electricity needed at the Pumpkin Patch and LCWA sites most of the time. Occasionally, additional power would need to be drawn from the Southern California Energy (SCE) grid. At the visitors center on the Synergy Oil Field site, emissions would be generated by electric consumption for lighting and natural gas consumption for space heating. Emissions from motor vehicles would be associated with cars traveling to and from the visitors center. Recurrent painting of the facilities at all of the individual sites would also contribute to the emissions.

CalEEMod was used to calculate the annual emissions except for the emissions from the gas turbine generator sets. Output files from the CalEEMod program are presented in Appendix B3. Emission calculations were provided by Solar Turbines (manufacturer of the Mercury 50 turbines) and dated November 7, 2016).

The turbines would be part of an overall design and energy production strategy that includes a microgrid and installation of solar photovoltaic modules. The project would construct and operate its own microgrid by designing the production facilities in such a manner that the microgrid would capture energy produced by the oil production operations (i.e., natural gas) and redistribute that energy elsewhere in the system. This project design feature (i.e., the microgrid) controls integration of multiple energy sources and uses to maximize efficiency, environmental benefits, cost savings and reliability. The energy source components would include an SCE grid connection, the four proposed 4.5 MW gas turbines with heat recovery, steam generators for cogeneration and potential generation of 18 MW, and renewable solar photovoltaic with generation potential of 158 kW. The microgrid system would provide the energy needed for the facilities including drilling rigs and supporting equipment, pumps, two electric vehicle charging stations, and other equipment.

The turbines would be required by the SCAQMD to meet the BACT standards, and this would likely require that the turbines have emission control features including lean-premix and selective catalytic reduction (SCR) or equivalent emission controls. See the Los Cerritos Wetlands Oil Consolidation and Restoration Project Greenhouse Gas Mitigation White Paper (BOMP 2017, provided in Appendix B4) for additional detail about design and operational characteristics of the project, cogeneration turbine and microgrid energy systems relative to GHG reductions.

As discussed in Chapter 2, Project Description, the project would implement a wetlands habitat restoration project that would remediate, if necessary, and restore the northern portion of the Synergy Oil Field site and
revegetate the southern portion of the Synergy Oil Field site as oil equipment, wells, and related facilities are removed over time. As discussed in Section 3.3, Biological Resources, street trees may be removed or trimmed in accordance with the City of Long Beach’s Tree Maintenance Policy and with the appropriate permits from the City of Long Beach Department of Public Works. The potential removal of street trees may result in less carbon sequestration on the site if the trees are actively growing and accumulating a net positive biomass; however, a loss of actively growing street trees would be offset by revegetation from implementation of the wetlands habitat restoration project, which would reestablish carbon sinks and the net effect on carbon sequestration would be little to no change (or potentially positive carbon sequestration if there is substantial revegetation of the wetlands that more than offsets the removal of street trees) and would not affect the project’s overall GHG emissions inventory.

Table 3.6-3, Operational Emissions, presents the results of the emission projections showing the average annual air pollutant emissions for each site. The GHG emissions associated with the turbines, which would be at the LCWA site, are broken out separately as they would generate the overwhelming majority of the GHG emissions. While the project’s non-turbine GHG emissions would not exceed 10,000 MTCO\(_2\)e/year, the total project GHG emissions, inclusive of the GHG emissions from the turbines, would exceed 10,000 MTCO\(_2\)e/year.

<table>
<thead>
<tr>
<th>Operational Emissions Source</th>
<th>MTCO(_2)e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pumpkin Patch</td>
<td>621</td>
</tr>
<tr>
<td>Visitors Center</td>
<td>611</td>
</tr>
<tr>
<td>LCWA Site</td>
<td>529</td>
</tr>
<tr>
<td>SCE Power</td>
<td>1,014</td>
</tr>
<tr>
<td><strong>Subtotal (without Turbines)</strong></td>
<td>2,775</td>
</tr>
<tr>
<td>Turbines at LCWA Site</td>
<td>67,581</td>
</tr>
<tr>
<td><strong>Total (with Turbines)</strong></td>
<td><strong>70,356</strong></td>
</tr>
</tbody>
</table>


The turbine emissions would be substantially lower than would otherwise be the case if all electricity were to be provided by SCE. Two examples are identified in the Greenhouse Gas Assessment for the Los Cerritos Wetlands Oil Consolidation and Restoration Project (Greve & Associates 2017). If the project did not invest in turbines, the use of turbine fuel (i.e., natural gas) elsewhere, via the regional natural gas grid, could increase GHG emissions up to approximately 143,975 MTCO\(_2\)e/year, more than doubling the project’s GHG emissions. A second example is the investment in cogeneration design/equipment for the turbines. Without that cogeneration investment, the GHG emissions from the turbines would increase by approximately 14,345 MTCO\(_2\)e/year.

**Total Emissions**

Total project emissions would be reduced over time as the existing oil field operations\(^{56}\) are gradually phased out. The existing oil field well sites would be phased out over a 40-year period, starting upon the completion and occupation of the new office building and warehouse on the Pumpkin Patch site. The emissions associated with

\(^{56}\) Based on the Greenhouse Gas Assessment by Greve & Associates, existing operations generate 22,211 TCO\(_2\)e/year (Greve & Associates 2017).
the assumed baseline oil operations would be reduced by 75 percent once building permits are obtained for the office building on the Pumpkin Patch site. Over the next 20 years, half of the existing 53 wells would be plugged and abandoned. This represents an 87.5 percent reduction from the assumed baseline emission levels. By year 40, all wells would be plugged and abandoned, which represents a 100 percent reduction of the baseline emissions.

**Table 3.6-4, Estimated Net Project Greenhouse Gas (GHG) Emissions, MTCO\textsubscript{2}e/year,** summarizes the impact the phase out would have on the project’s total GHG emissions. As shown in Table 3.6-4, construction and operation of the proposed project would result in net GHG emissions of approximately 53,642 MTCO\textsubscript{2}e/year for the first 20 years, 50,955 MTCO\textsubscript{2}e/year for years 20 through 40, and 48,145 MTCO\textsubscript{2}e/year for any time after 40 years.

<table>
<thead>
<tr>
<th>Emission Source</th>
<th>First 20 years</th>
<th>Years 20 to 40</th>
<th>After 40 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annualized Construction Emissions (^a)</td>
<td>157</td>
<td>157</td>
<td>0</td>
</tr>
<tr>
<td>Operational Emissions (stationary sources)</td>
<td>67,581</td>
<td>67,581</td>
<td>67,581</td>
</tr>
<tr>
<td>Operational Emissions (other sources) (^b)</td>
<td>2,775</td>
<td>2,775</td>
<td>2,775</td>
</tr>
<tr>
<td>Total Annualized Emissions</td>
<td>70,513</td>
<td>70,513</td>
<td>70,356</td>
</tr>
<tr>
<td>Curtained Emissions</td>
<td>(16,871)</td>
<td>(19,558)</td>
<td>(22,211)</td>
</tr>
<tr>
<td><strong>Net Total Annualized Emissions</strong></td>
<td><strong>53,642</strong></td>
<td><strong>50,955</strong></td>
<td><strong>48,145</strong></td>
</tr>
</tbody>
</table>

**GHG Significance Threshold**
- Exceeds Significance Threshold?
  - Yes
  - Yes
  - Yes

\(^a\) Construction emissions are annualized over 30 years; therefore, after 40 years, these emissions are reported as zero.

\(^b\) A portion of these emissions are from motor vehicles, which would decline in future years as vehicles are replaced with newer models that meet more stringent emission standards. Therefore, these emissions represent a conservative estimate for the future years and actual emission would likely be lower.

**Table 3.6-5, GHG Emissions Compared to Applicable Thresholds,** shows that the total GHG emissions for the project, both with and without the GHG emissions associated with the turbines but including amortized construction GHG emissions, building energy GHG emissions, and worker, visitor, and truck trips.

<table>
<thead>
<tr>
<th>Emission Source</th>
<th>Emissions (MTCO\textsubscript{2}e/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amortized Construction Emissions (30 years)</td>
<td>157</td>
</tr>
<tr>
<td>Annual Operational Emissions (without Turbines)</td>
<td>2,775</td>
</tr>
<tr>
<td><strong>Subtotal (without Turbines)</strong></td>
<td><strong>2,932</strong></td>
</tr>
<tr>
<td>Turbines at LCWA Site</td>
<td>67,581</td>
</tr>
<tr>
<td><strong>Total Project GHG Emissions (with Turbines)</strong></td>
<td><strong>70,513</strong></td>
</tr>
</tbody>
</table>

As discussed above, the project’s net GHG emission in future years would decline as existing site emissions are curtailed by phasing out the existing oil field operations. Total GHG emissions inclusive of the turbine emissions would be approximately 70,513 MTCO\textsubscript{2}e/year, of which 67,581 MTCO\textsubscript{2}e/year (or 96 percent)
would generated by the turbines in the first year. After 40 years, the project’s net emissions (accounting for the phasing out of oil operations) would decline to 48,145 MTCO$_2$e/year.

Under CEQA, the GHG emission impact of a project is based on the incremental or net change in emissions compared to the existing physical conditions in the affected area as they exist at the time the notice of preparation is published (refer to CEQA Guidelines Section 15126.2). As shown in Table 3.6-4, the net total project GHG emissions, inclusive of the GHG emissions from the turbines and the reduction of the existing GHG emissions from the plugging and abandonment of the existing wells (i.e., 75 percent of the existing wells once building permits are obtained for the office building on the Pumpkin Patch site, 87.5 percent of the wells over the next 20 years, and 100 percent of the existing wells by Year 40) would exceed 10,000 MTCO$_2$e/year. As result, impacts would be considered significant.

**Mitigation Measures**

As shown in Table 3.6-4, the project’s net GHG emissions, inclusive of the GHG emissions from the turbines and the reduction in GHG emissions from the plugging and abandonment of the existing wells, would exceed 10,000 MTCO$_2$e/year, impacts would be considered significant, and the following mitigation measure would be required to reduce GHG emissions:

**Mitigation Measure GHG-1: Cap-and-Trade Program.** The project shall comply with the Cap-and-Trade Program as administered by CARB for covered sources. In accordance with the Cap-and-Trade Program, the project shall retire GHG allowances or offsets equal to the project’s GHG emissions for covered sources. Retiring the GHG allowances or offsets means the project would acquire them through a number of means carefully controlled by CARB, including obtaining allowances and offsets in CARB-controlled auctions with variable and increasing cost, according to projections and decreasing supply. The project shall also comply with all applicable and required reporting requirements and GHG reduction and trading requirements. The project shall also comply with all applicable Cap-and-Trade regulations as they continue to evolve, such as revisions to the Climate Change Scoping Plan, and become adopted by the California Legislature and/or through CARB’s rulemaking process.

CARB’s Cap-and-Trade Program applies to covered entities that emit more than 25,000 MTCO$_2$e/year. Because the project’s covered sources under the Cap-and-Trade Program would exceed the 25,000 MTCO$_2$e/year threshold, the project would be required to implement Mitigation Measure GHG-1 and comply with the Cap-and-Trade Program. Under the Cap-and-Trade Program, CARB would require the project to obtain GHG allowances or offsets or the project’s total emissions shown in Table 3.6-5 and not the net GHG emissions shown in Table 3.6-4, which accounts for the reduction in GHG emissions from the plugging and abandonment of the existing wells. CEQA generally allows for projects to evaluate and mitigate impacts based on the net change in emissions. Since the Cap-and-Trade Program would mitigate the project’s total GHG emissions, implementation of Mitigation Measure GHG-1 would mitigate the project’s GHG emissions to a greater level than would normally be required under CEQA. In addition, the project may be subject to additional reporting requirements and GHG reduction and trading requirements as the Cap-and-Trade regulations continue to evolve, such as under the 2017 Climate Change Scoping Plan.

Regarding the amount of required allowances/offsets, the Cap-and-Trade Program uses measured operational GHG emissions as annually reported to CARB. Per the GHG emissions shown in Table 3.6-3, the annual measured operational GHG emissions are calculated to be between 67,581 (turbines only) and 70,356 (all sources) MTCO$_2$e/year. These emissions do not account for the cessation of existing GHG generating activities on the site over time. This means that compliance with the Cap-and-Trade regulation would require the project...
to mitigate GHG emissions associated with all stationary sources and the turbines, which are projected to exceed the project’s net GHG emissions as the existing wells are decommissioned.

The project’s emissions would be mitigated by participation in the Cap-and-Trade program. Therefore, impacts from GHG emissions would be mitigated to a less-than-significant level.

Significance Determination: Less than Significant with Mitigation.

Impact GHG-2: The proposed project would not conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. (Less than Significant with Mitigation)

HSC Division 25.5 established statewide targets for reducing the State’s GHG emissions. The implementing tools of the law (e.g., CARB’s Climate Change Scoping Plan) are clear that the reductions are not expected to occur uniformly from all sources or sectors. CARB has established strategies for reducing emissions from various sectors including transportation, energy, and stationary sources. CARB has outlined a number of potential strategies for achieving the 2030 reduction target of 40 percent below 1990 levels, including continuation of Cap-and-Trade, sourcing 50 percent or more of the state’s electricity by 2030, reducing petroleum use in cars and trucks, and reducing the carbon content of transportation fuels. The proposed project would comply with these future regulations, as promulgated by the USEPA, CARB, CEC, or other agency.

Cap-and-Trade

As required per Mitigation Measure GHG-1, the project would be designed to incorporate efficient technologies and would be consistent with strategies to minimize GHG emissions from stationary sources. Compliance with the Cap-and-Trade Program would ensure facility emissions would be reduced as required by CARB and HSC Division 25.5. The project would contribute GHG emissions as an Electricity Self-Generation entity that is subject to the Cap-and-Trade Program. As such, emissions from the project would be reduced on a sector-wide basis in accordance with the GHG reduction targets of HSC Division 25.5 and future updates by CARB to the Climate Change Scoping Plan and the Cap-and-Trade Program. Currently, the California Cap-and-Trade Program is effective through 2020. CARB’s 2017 Climate Change Scoping Plan Update details the “Proposed Scoping Plan Scenario” (proposed scenario) recommending the optimal path to meeting the GHG reduction target represented by SB 32 while providing the widest range of environmental and economic benefits. The proposed scenario includes extending the low carbon fuel standard to 18 percent, greatly reducing emissions of methane and other highly potent GHGs (SB 1383), and a 20 percent refinery sector reduction, all with a 2030 implementation time frame. In addition, a critical element of the proposed scenario includes extending the Cap-and-Trade Program beyond 2020. Notably, a recent decision by the 3rd District Court of Appeals in Sacramento upheld a decision confirming the legality of the Cap-and-Trade system as a legitimate program that does not constitute an unconstitutional tax. It is reasonable to assume that Cap-and-Trade would continue to be a cornerstone strategy for GHG reduction after 2020 based on the court ruling and CARB’s proposed scenario. Under the proposed scenario, the project would continue to be subject to a Cap-and-Trade program, and thus would be consistent with CARB’s Scoping Plan.

Stationary Source Best Available Control Technology

During project operations, the most prominent source of GHG emissions would be the on-site natural-gas-fired turbines used to generate the electricity for on-site use. As discussed above, the turbine cogeneration process
would use waste heat from the turbine exhaust to heat oil and water, and cool gas as part of the oil production/separation process. The water reclaimed from this process would be injected back into the oil production formation, and the gas not used by the on-site turbines and oil would be sold for use and further processing. Without cogeneration, natural gas would be combusted in a boiler to heat the oil/water mixture and the refrigeration units would be powered by off-site generated electricity. Therefore, without cogeneration additional GHG would be generated by the combustion of natural gas for heating and by electric consumption for cooling. Furthermore, as discussed previously, the turbines would be required by the SCAQMD to meet the BACT standards, and this would likely require that the turbines have emission control features including lean-premix and SCR or equivalent emission controls.

The project would also incorporate design features to minimize fugitive emissions of methane. Tanks at both Pumpkin Patch and LCWA sites would consist of fixed-roof gas blanket design, which would substantially eliminate fugitive emissions from tanks. Valves, flanges, pumps, and compressors would be designed to meet emission standards specified by applicable rules, such as SCAQMD Rules 466 and 466.1 (refer to Section 3.2, Air Quality, for a description of applicable SCAQMD rules).

As discussed above, the project would include cogeneration and comply with BACT standards for the turbines, comply with applicable SCAQMD rules and regulations (refer to Section 3.2, Air Quality, for a list of SCAQMD rules and regulations applicable to the project), and include microgrid system and solar photovoltaic modules to provide efficient energy for the facilities including drilling rigs and supporting equipment, pumps, two electric vehicle charging stations, and other equipment, the project would not conflict with applicable regulations to reduce GHG emissions.

**Construction and Mobile Source Emissions**

The proposed project would utilize construction contractors that would be in compliance with regulations including the USEPA Heavy Duty Vehicle Greenhouse Gas Regulation and the CARB ACTM that limits heavy-duty diesel motor vehicle idling. Furthermore, the project would accelerate the use of cleaner construction equipment as specified in Mitigation Measures AQ-2 and AQ-3, which require the use of equipment certified to the Tier IV emission controls. Implementation of these measures would ensure that fuel-efficient equipment would be used, which would reduce emissions compared to fleet average equipment. Additionally, as the project is an industrial use, GHG emissions associated with mobile sources would only occur from periodic vehicle trips by workers for inspection and maintenance purposes and visitors to the visitors center, which would not generate substantial emissions. Nonetheless, workers and visitors to the site would utilize vehicles that comply with State motor vehicle emissions standards. Therefore, the project would not conflict with applicable regulations to reduce GHG emissions.

**Conclusion**

As indicated above, the **CEQA Guidelines** were amended in response to SB 97. In particular, the **CEQA Guidelines** were amended to specify that compliance with a GHG emissions reduction program renders a cumulative impact of less than significant. Per **CEQA Guidelines** Section 15064(h)(3), a project’s contribution to an impact can be found not considerable if the project would comply with an approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the problem within the geographic area of the project. To qualify, such a plan or program must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency. Examples of such programs
include a “water quality control plan, air quality attainment or maintenance plan, integrated waste management plan, habitat conservation plan, natural community conservation plan, [and] plans or regulations for the reduction of greenhouse gas emissions.” Put another way, CEQA Guidelines Section 15064(h)(3) allows a lead agency to make a finding of less than significant for GHG emissions if a project complies with the California Cap-and-Trade Program or other regulatory schemes to reduce GHG emissions.

Given that the project would generate GHG emissions consistent with applicable reduction plans and policies with implementation of Mitigation Measure GHG-1, and given that GHG emission impacts are cumulative in nature, the project’s incremental contribution to significant GHG emissions would be less than cumulatively considerable with mitigation, and impacts would be less than significant with mitigation.

**Mitigation Measures:** Mitigation Measure GHG-1 would apply.

**Significance Determination:** Less than Significant with Mitigation.

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**Consistency with SCAG 2016 RTP/SCS**

While the project is not a transportation project or a residential, commercial, or mixed-use project that would generate substantial numbers of vehicle trips, the project would contribute to the City’s non-automotive transportation network. The project would provide public access to view the wetlands on the Synergy Oil Field site and would provide improved bicycle lanes on the streets that front all four individual sites that comprise the project site, all of which would encourage active transportation and, thus, would provide opportunities for City residents, employees, and visitors to utilize non-automotive forms of transportation and reduce transportation-related air pollutant and GHG emissions. Therefore, the proposed project would be consistent with the SCAG 2016 RTP/SCS goal of improving air quality and encouraging active transportation (e.g., bicycling and walking).

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**3.6.5 References**


San Joaquin Valley Air Pollution Control District (SJVAPCD). 2014. *CEQA Determinations of Significance for Projects Subject to ARB’s GHG Cap-and-Trade Regulation*. APR-2025, June 25.


