

2.7 Greenhouse Gas Emissions

This section of the environmental impact report (EIR) evaluates the significance of Otay Ranch Village 14 and Planning Areas 16/19 (Proposed Project) greenhouse gas (GHG) emissions by analyzing the increase in GHG emissions that would result, directly or indirectly, from implementation of the Proposed Project, and examining the Proposed Project relative to relevant planning and policy benchmarks. Project Design Features (PDFs) that would reduce GHG emissions are identified, and construction and operational GHG emissions that would be generated by the Proposed Project are quantified. This section concludes by identifying feasible mitigation to reduce the Proposed Project's potential GHG impacts to below a level of significance.

This analysis is based on the Greenhouse Gas Emissions Technical Report prepared for the Proposed Project (Appendix 2.7-1). The Proposed Project's GHG emissions estimates presented in this section were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.1.^{1,2}

This section tiers from the 1993 Otay Ranch Final Program EIR (Otay Ranch PEIR) (City of Chula Vista and County of San Diego 1993a) because the Proposed Project is within the boundaries of the Otay Ranch General Development Plan/Otay Subregional Plan area (Otay Ranch GDP/SRP) (City of Chula Vista and County of San Diego 1993b), and development of the Project Area was analyzed in the Otay Ranch PEIR. Because GHG emissions were not specifically analyzed in the Otay Ranch PEIR, detailed consideration of the Proposed Project's GHG emissions is presented in this section.

¹ CalEEMod is an emissions model designed to provide a uniform platform to calculate construction and operational emissions from land use development projects. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with multiple air districts across California. Numerous lead agencies in the state, including the County of San Diego, use CalEEMod to estimate GHG emissions in accordance with CEQA Guidelines Section 15064.4(a)(1).

² CalEEMod Version 2016.3.1 was the current version of CalEEMod when the Proposed Project analysis was initiated. In October 2017, CalEEMod Version 2016.3.2 was released, followed by CalEEMod Version 2016.3.2.25 in November 2017, which fixed a Windows security update issue in Version 2016.3.2. CalEEMod Version 2016.3.2 included five upgrades and ten bug fixes. The most notable upgrade and bug fix, respectively, is the incorporation of percent reductions in default energy consumption to reflect compliance with the 2016 Title 24, Part 6 Building Energy Efficiency Standards and fixing the bug that overestimated annual construction PM₁₀ and PM_{2.5} emissions from fugitive dust in multiple year scenario runs (SCAQMD 2017). All CalEEMod Version 2016.3.2 updates were reviewed and it was determined that use of CalEEMod Version 2016.3.2 is not anticipated to result in greater GHG emissions compared to estimated Proposed Project emissions generated using CalEEMod Version 2016.3.1. Accordingly, use of CalEEMod Version 2016.3.1 is appropriate for the Proposed Project's GHG emissions analysis.

2.7.1 Existing Conditions

2.7.1.1 Climate Change Overview

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in the Earth's energy balance, including variations in the sun's energy reaching the Earth, changes in the reflectivity of the Earth's atmosphere and surface, and changes in the "greenhouse effect," which affects the amount of heat retained by the Earth's atmosphere (EPA 2017a).

The "greenhouse effect" is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short-wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales and that, in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. Recent climate changes, in particular the warming observed over the past century, however, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of that warming since the mid-20th century and are the most significant driver of observed climate change (EPA 2017a; IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system, which is discussed further in Section 2.7.1.4, Potential Effects of Climate Change, below.

2.7.1.2 Greenhouse Gases

As defined in California Health and Safety Code Section 38505(g), for purposes of administering many of the state's primary GHG emissions reduction programs, GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃) (see also CEQA Guidelines Section 15364.5). Some GHGs, such as CO₂, CH₄, and N₂O, occur naturally and are emitted to

the atmosphere through natural processes and human activities. Of these gases, CO₂ and CH₄ are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO₂, include fluorinated gases, such as HFCs, HCFCs, PFCs, and SF₆, and are associated with certain industrial products and processes.

The following paragraphs provide a summary of the GHGs that are estimated in CalEEMod and relevant to this section's analysis.^{3,4}

Carbon Dioxide (CO₂). CO₂ is a naturally occurring gas and a by-product of human activities, and is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO₂ include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO₂ are the combustion of coal, oil, natural gas, and wood.

Methane (CH₄). CH₄ is a flammable gas and is the main component of natural gas. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide (N₂O). Sources of N₂O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and the use of N₂O as a propellant (such as in rockets, racecars, aerosol sprays).

GHGs in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo) (EPA 2017b).

The Intergovernmental Panel on Climate Change (IPCC) developed the global warming potential (GWP) concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing

³ Climate forcing substances include GHGs and other substances, such as black carbon and aerosols. This section's analysis focuses on the GHGs that are estimated by CalEEMod. However, a brief description of other climate forcing substances is provided in Appendix 2.7.1 for information purposes.

⁴ The descriptions of these GHGs are summarized from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (1995), IPCC Fourth Assessment Report (2007), the California Air Resources Board's Glossary of Terms Used in GHG Inventories (CARB 2015a), and U.S. Environmental Protection Agency's Glossary of Climate Change Terms (EPA 2016a).

from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO₂; therefore, GWP-weighted emissions are measured in metric tons (MT) of CO₂ equivalent (CO₂e).

CalEEMod (Version 2016.3.1) used in this analysis assumes that the GWP for CH₄ is 25 (so emissions of 1 MT of CH₄ are equivalent to emissions of 25 MT of CO₂), and the GWP for N₂O is 298, based on the IPCC's Fourth Assessment Report (IPCC 2007).

2.7.1.3 Sources of Greenhouse Gas Emissions

Per the U.S. Environmental Protection Agency's (EPA) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2015, total United States GHG emissions were approximately 6,586.7 million metric tons (MMT) CO₂e in 2015 (EPA 2017b). The primary GHG emitted by human activities in the United States was CO₂, which represented approximately 82.2% of total GHG emissions (5,411.4 MMT CO₂e). The largest source of CO₂, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.3% of CO₂ emissions in 2015 (5,049.8 MMT CO₂e). Relative to the 1990 emissions level, gross United States GHG emissions in 2015 are 3.5% higher; however, the gross emissions are down from a high of 15.5% above the 1990 level that occurred in 2007. GHG emissions decreased from 2014 to 2015 by 2.3% (153.0 MMT CO₂e) and, overall, net emissions in 2015 were 11.5% below 2005 levels (EPA 2017b).

According to California's 2000–2015 GHG emissions inventory (2017 edition), California emitted 440.36 MMT CO₂e in 2015, including emissions resulting from out-of-state electrical generation (CARB 2017a). The sources of GHG emissions in California include transportation, industry, electric power production from both in-state and out-of-state sources, residential and commercial activities, agriculture, high global-warming potential substances, and recycling and waste. The California GHG emission source categories and their relative contributions in 2015 are presented in Table 2.7-1, GHG Emissions Sources in California.

Between 2000 and 2015, per-capita GHG emissions in California have dropped from a peak of 14.0 MT per person in 2001 to 11.3 MT per person in 2015, representing a 19% decrease. In addition, total GHG emissions in 2015 were approximately 1.5 MMT CO₂e less than 2014 emissions. The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California is on track to meet the 2020 target of 431 MMT CO₂e (CARB 2017a).

According to the GHG inventory data compiled by the Energy Policy Initiative Center, in 2010, San Diego County emitted 34.5 MMT CO₂e (EPIC 2013). As outlined in Table 2.7-2, San Diego County GHG Emissions by Sectors, on-road transportation created 42% of these emissions. Similar to emissions trends statewide, electricity generation is the second biggest emitter.

2.7.1.4 *Potential Effects of Climate Change*

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The IPCC's 2014 Synthesis Report indicated that warming of the climate system is unequivocal and, since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, and rising sea levels (IPCC 2014).

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights; shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year; sea levels have risen; and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010a, 2010b). A brief summary of current and future climate change impacts to resource areas in California, as discussed in *Safeguarding California: Reducing Climate Risk* (CNRA 2014), is provided below. Additional discussion is provided in Appendix 2.7-1.

Agriculture. Some of the specific challenges faced by the agricultural sector and farmers include more drastic and unpredictable precipitation and weather patterns; extreme weather events; significant shifts in water availability and water quality; changes in pollinator lifecycles; temperature fluctuations; increased risks from invasive species and weeds, agricultural pests, and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production.

Biodiversity and Habitat. Specific climate change challenges to biodiversity and habitat include species migration, range shift, and novel combinations of species; pathogens, parasites, and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; and threshold effects (i.e., a change in the ecosystem that results in a “tipping point” beyond which irreversible damage or loss occurs).

Energy. Specific climate change challenges for the energy sector include temperature, fluctuating precipitation patterns, increasing extreme weather events, and sea level rise. Increasing temperatures and reduced snowpack negatively impact the availability of a steady flow of snowmelt to hydroelectric reservoirs. Higher temperatures also reduce the capacity of thermal power plants since power plant cooling is less efficient at higher ambient temperatures. Natural gas infrastructure in coastal California is threatened by sea level rise and extreme storm events.

Forestry. The most significant climate change related risk to forests is accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large scale

mortalities and combined with increasing temperatures have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts, and vegetation conversions. These factors contribute to decreased forest growth, geographic shifts in tree distribution, loss of fish and wildlife habitat, and decreased carbon absorption.

Ocean and Coastal Ecosystems and Resources. Sea level rise, changing ocean conditions, and other climate change stressors are likely to exacerbate long-standing challenges related to ocean and coastal ecosystems in addition to threatening people and infrastructure located along the California coastline and in coastal communities.

Public Health. Climate change can impact public health through various environmental changes and is the largest threat to human health in the 21st century. Changes in precipitation patterns affect public health primarily through potential for altered water supplies, and extreme events such as heat, floods, droughts, and wildfires. Increased frequency, intensity, and duration of extreme heat and heat waves is likely to increase the risk of mortality due to heat-related illness as well as exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively impact air quality and increase or intensify respiratory illness such as asthma and allergies.

Transportation. The transportation industry is vulnerable to climate change risks, including sea level rise and erosion, which threaten many coastal California roadways, airports, seaports, transit systems, bridge supports and energy and fueling infrastructure. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. Other forms of extreme weather events, such as extreme storm events, can negatively impact infrastructure, which can impair movement of peoples and goods, or potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion risks, landslides, mudslides, and rockslides can all profoundly impact the transportation system and pose a serious risk to public safety.

Water. Climate change could seriously impact the timing, form, amount of precipitation, runoff patterns, and frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can impact water supply availability, natural ecosystems, and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during the winter time. Increased risk of flooding has a variety of public health concerns including water quality, public safety, property damage, displacement and post-disaster mental health problems. Prolonged and intensified droughts can also negatively affect groundwater reserves and result in increased overdraft and subsidence.

In March 2016, the California Natural Resources Agency released *Safeguarding California: Implementation Action Plans*, a document that shows how California is acting to convert the recommendations contained in the 2014 *Safeguarding California* plan into action (CNRA 2016). Additionally, in May 2017, the California Natural Resources Agency released the draft *Safeguarding California Plan: 2017 Update*, which is a survey of current programmatic responses for climate change and contains recommendations for further actions (CNRA 2017).

The CNRA released *Safeguarding California Plan: 2018 Update* in January 2018, which provides a roadmap for state agencies to protect communities, infrastructure, services, and the natural environment from climate change impacts. The 2018 *Safeguarding California Plan* includes 69 recommendations across 11 sectors and more than 1,000 ongoing actions and next steps developed by scientific and policy experts across 38 state agencies (CNRA 2018).

2.7.1.5 Carbon Sequestration

Carbon sequestration is the process by which CO₂ is removed from the atmosphere and deposited into a carbon reservoir (e.g., vegetation). Trees and vegetation take in CO₂ from the atmosphere during photosynthesis, break down the CO₂, store the carbon within plant parts, and release the oxygen back into the atmosphere (CARB 2015b). A development that changes land use type results in potential release of sequestered carbon to the atmosphere as CO₂, which would not have been released had there been no land-type change. The planting of new trees and vegetation would store new carbon as their wood mass increases via normal growth.

2.7.2 Regulatory Setting

The following text describes executive orders, legislation, regulations, court decisions, and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues. Please see Appendix 2.7-1 for additional information.

2.7.2.1 Federal

Massachusetts v. EPA. In *Massachusetts v. EPA* (April 2007), the U.S. Supreme Court directed the EPA administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In December 2009, the administrator signed a final rule with the following two distinct findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- The Administrator found that elevated concentrations of GHGs—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations. This is the “endangerment finding.”

- The Administrator further found the combined emissions of GHGs—CO₂, CH₄, N₂O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is the “cause or contribute finding.”

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, would do the following, which would aid in the reduction of national GHG emissions (EPA 2007):

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020 and direct the National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards. In response to the U.S. Supreme Court ruling in *Massachusetts v. EPA*, the George W. Bush Administration issued Executive Order (EO) 13432 in 2007 directing EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011; and, in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016 (75 FR 25324–25728).

In 2010, President Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of CO₂ by model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021 (77 FR

62624–63200). On January 12, 2017, EPA finalized its decision to maintain the current GHG emissions standards for model years 2022–2025 cars and light trucks (EPA 2017c).

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018 (76 FR 57106–57513). The standards for CO₂ emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6% to 23% over the 2010 baselines.

In August 2016, the EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans and all types of sizes of buses and work trucks. The final standards are expected to lower CO₂ emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

2.7.2.2 State

The statewide GHG emissions regulatory framework is summarized below by category: state climate change targets, building energy, renewable energy and energy procurement, mobile sources, solid waste, water, and other state regulations and goals. Refer to Appendix 2.7-1 for an expanded list of state laws, regulations, and policies related to GHG emissions and climate change.

State Climate Change Targets

EO S-3-05. EO S-3-05 (June 2005) established the following statewide goals: GHG emissions should be reduced to 2000 levels by 2010, GHG emissions should be reduced to 1990 levels by 2020, and GHG emissions should be reduced to 80% below 1990 levels by 2050.

Assembly Bill 32 and CARB’s Climate Change Scoping Plan. In furtherance of the goals established in EO S-3-05, the Legislature enacted Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020.

Under AB 32, the California Air Resources Board (CARB) is responsible for and is recognized as having the expertise to carry out and develop the programs and requirements necessary to achieve the GHG emissions reduction mandate of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions from specified sources. This program is

used to monitor and enforce compliance with established standards. CARB also is required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 relatedly authorized CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

In 2007, CARB approved a limit on the statewide GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 MMT CO₂e). CARB's adoption of this limit is in accordance with Health and Safety Code Section 38550.

Further, in 2008, CARB adopted the Climate Change Scoping Plan: A Framework for Change (Scoping Plan) in accordance with Health and Safety Code Section 38561. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions for various emission sources/sectors to 1990 levels by 2020. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction features by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program.

In 2014, CARB adopted the First Update to the Climate Change Scoping Plan: Building on the Framework (First Update). The stated purpose of the First Update is to "highlight California's success to date in reducing its GHG emissions and lay the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80% below 1990 levels by 2050." The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32, and noted that California could reduce emissions further by 2030 to levels squarely in line with those needed to stay on track to reduce emissions to 80% below 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals (CARB 2014).

In conjunction with the First Update, CARB identified "six key focus areas comprising major components of the state's economy to evaluate and describe the larger transformative actions that will be needed to meet the state's more expansive emission reduction needs by 2050." Those six areas are energy transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure) agriculture water waste management, and natural and working lands. The First Update identifies key recommended actions for each sector that will facilitate achievement of EO S-3-05's 2050 reduction goal (CARB 2014).

Based on CARB's research efforts presented in the First Update, it has a "strong sense of the mix of technologies needed to reduce emissions through 2050." Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-road

vehicles, buildings and industrial machinery; decarbonizing electricity and fuel supplies; and, the rapid market penetration of efficient and clean energy technologies (CARB 2014).

In January 2017, CARB released The 2017 Climate Change Scoping Plan Update (Second Update) for public review and comment (CARB 2017b). This update proposes CARB's strategy for achieving the state's 2030 GHG target as established in Senate Bill (SB) 32 (discussed in Section 2.7.2.2). When discussing project-level GHG emissions reduction actions and thresholds, the Second Update states "achieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA." The Second Update was approved by CARB's Governing Board on December 14, 2017 (CARB 2017b).

EO B-30-15. EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under EO S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing statewide GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing statewide GHG emissions to 80% below 1990 levels by 2050 as set forth in EO S-3-05. To facilitate achievement of this goal, EO B-30-15 calls for an update to CARB's Scoping Plan to express the 2030 target in terms of MMT CO₂e. The EO also calls for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets. EO B-30-15 does not require local agencies to take any action to meet the new interim GHG reduction target.

SB 32 and AB 197. SB 32 and AB 197 (enacted in 2016) are companion bills that set a new statewide GHG reduction target, make changes to CARB's membership and increase legislative oversight of CARB's climate change-based activities, and expand dissemination of GHG and other air quality-related emissions data to enhance transparency and accountability. More specifically, SB 32 codified a 2030 emissions reduction target that requires CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, to provide ongoing oversight over implementation of the state's climate policies. AB 197 also adds two members of the Legislature to CARB as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs and other pollutants from reporting facilities; and, requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

Building Energy

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. Although not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically establishes Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. The California Energy Commission (CEC) is required by law to adopt standards every 3 years that are cost effective for homeowners over the 30-year lifespan of a building. These standards are updated to consider and incorporate new energy efficient technologies and construction methods. As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The 2016 Title 24 standards are the currently applicable building energy efficiency standards, and became effective on January 1, 2017. In general, single-family homes built to the 2016 standards are anticipated to use about 28% less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards, and non-residential buildings built to the 2016 standards will use an estimated 5% less energy than those built to the 2013 standards (CEC 2015a).

Title 24, Part 11. In addition to the CEC's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as CALGreen, and establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential, and state-owned buildings, schools, and hospitals. The CALGreen 2016 standards became effective on January 1, 2017.

The mandatory CALGreen standards require the following (CALGreen 2016a):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources' Model Water Efficient Landscape Ordinance
- 65% of construction and demolition waste diverted from landfills
- Mandatory inspections of energy systems to ensure optimal working efficiency

- Inclusion of electric vehicle (EV) charging stations or designated spaces capable of supporting future charging stations
- Low-pollutant emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle boards

Zero Net Energy Goals. The California Public Utilities Commission, CEC, and CARB also have a shared, established goal of achieving zero net energy (ZNE) for new construction in California. The key policy timelines include all new residential construction in California will be ZNE by 2020, and all new commercial construction in California will be ZNE by 2030 (CPUC 2013). As most recently defined by the CEC in its 2015 Integrated Energy Policy Report, a ZNE code building is “one where the value of the energy produced by on-site renewable energy resources is equal to the value of the energy consumed annually by the building” using the CEC’s time-dependent valuation metric (CEC 2015b).

Title 20. Title 20 of the California Code of Regulations requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. Performance of appliances must be certified through the CEC to demonstrate compliance with standards. New appliances regulated under Title 20 include refrigerators, freezers, air conditioners, dishwashers, clothes washers and dryers, cooking appliances, televisions, and consumer audio and video equipment. Title 20 presents protocols for testing for each type of appliance covered under the regulations and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: federal and state standards for federally regulated appliances, state standards for federally regulated appliances, and state standards for non-federally regulated appliances.

Renewable Energy and Energy Procurement

Renewables Portfolio Standard (RPS). SB 1078 (2002) established the Renewables Portfolio Standard (RPS) program, which requires an annual increase in renewable generation by the utilities. Initially, the RPS required utilities to obtain 20% of their power from renewable sources by 2010. SB X1-2 (2011) subsequently expanded the RPS by establishing that 33% of the total electricity sold to retail customers in California per year by December 31, 2020, and in subsequent years, be secured from qualifying renewable energy sources. SB 350 (2015) further expanded the RPS by establishing that 50% of the total electricity sold to retail customers in California per year by December 31, 2030, be secured from qualifying renewable energy sources. Under the program, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion,

landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location.

Mobile Sources

AB 1493. In response to the transportation sector accounting for more than half of California's CO₂ emissions, AB 1493 (2002) required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles primarily used for noncommercial personal transportation. The bill specifically required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. The near-term (2009–2012) standards were estimated to result in a reduction of about 22% in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards were estimated to result in a reduction of about 30%.

EO S-1-07. Issued in 2007, EO S-1-07 set a declining Low Carbon Fuel Standard for GHG emissions measured in CO_{2e} grams per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. CARB adopted implementing regulation in 2009.

SB 375. SB 375 (2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 required CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035. Regional metropolitan planning organizations are then responsible for preparing a Sustainable Communities Strategy within their Regional Transportation Plan. The goal of the Sustainable Communities Strategy is to establish a forecasted development pattern for the region that, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets.

Pursuant to Government Code Section 65080(b)(2)(K), a sustainable communities strategy does not regulate the use of land; supersede the land use authority of cities and counties; or require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

In 2010, CARB adopted the SB 375 targets for the regional metropolitan planning organizations. The targets for SANDAG are a 7% reduction in emissions per capita by 2020 and a 13% reduction by 2035.

SANDAG completed and adopted its 2050 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) in October 2011. In November 2011, CARB, by resolution, accepted

SANDAG's GHG emissions quantification analysis and determination that, if implemented, the SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region.

After SANDAG's 2050 RTP/SCS was adopted, a lawsuit was filed by the Cleveland National Forest Foundation and others. The case was decided in July 2017, and the court found that the EIR did not have to use EO S-3-05's 2050 goal of an 80% reduction in GHG emissions from 1990 levels as a threshold because the EIR sufficiently informed the public of the potential impacts.

Although the EIR for SANDAG's 2050 RTP/SCS was pending before the California Supreme Court in 2015, SANDAG adopted the next iteration of its RTP/SCS in accordance with statutorily mandated timelines, and no subsequent litigation challenge was filed. More specifically, in October 2015, SANDAG adopted San Diego Forward: The Regional Plan. Like the 2050 RTP/SCS, this planning document meets CARB's 2020 and 2035 reduction targets for the region (SANDAG 2015). In December 2015, CARB, by resolution, accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the SCS would achieve CARB's 2020 and 2035 GHG emissions reduction targets for the region.

Advanced Clean Cars Program. In January 2012, CARB approved the Advanced Clean Cars program, a new emissions-control program for model years 2015 through 2025. The program includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars (CARB 2011). CARB's GHG standards for model year 2017 to 2025 vehicles are estimated to reduce GHG emissions by 34% in 2025. The Zero Emissions Vehicle (ZEV) program acts as the focused advanced technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid EVs in the 2018 to 2025 model years. The Clean Fuels Outlet regulation relatedly ensures that fuels, such as electricity and hydrogen, are available to meet the fueling needs of the new advanced technology vehicles as they come to the market.

EO B-16-12. EO B-16-12 (2012) directs state entities under the governor's direction and control to support and facilitate development and distribution ZEVs. This executive order also sets a long-term target of reaching 1.5 million zero-emissions vehicles on California's roadways by 2025. On a statewide basis, EO B-16-12 also establishes a GHG emissions reduction target from the transportation sector equaling 80% less emissions than 1990 levels by 2050. In furtherance of this executive order, the governor convened an Interagency Working Group on ZEVs that has published multiple reports regarding the progress made on the penetration of ZEVs in the statewide vehicle fleet.

AB 1236. AB 1236 (2015) as enacted in California's Planning and Zoning Law, requires local land use jurisdictions to approve applications for the installation of EV charging stations, as defined, through the issuance of specified permits unless there is substantial evidence in the

record that the proposed installation would have a specific, adverse impact upon the public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. In August 2016, the County of San Diego (County) Board of Supervisors adopted Ordinance No. 10437 (N.S.), adding a section to its County Code related to the expedited processing of electric-vehicle charging station permits consistent with AB 1236.

SB 350. In 2015, SB 350 – the Clean Energy and Pollution Reduction Act – was enacted into law. As one of its elements, SB 350 establishes a statewide policy for widespread electrification of the transportation sector, recognizing that such electrification is required for achievement of the state’s 2030 and 2050 reduction targets (see Public Utilities Code section 740.12).

EO B-48-18. EO B-48-18 (2018) launches an eight-year initiative to accelerate the sale of EVs through a mix of rebate programs and infrastructure improvements. The order also sets a new EV target of five million EVs in California by 2030. EO B-48-18 includes funding for multiple state agencies including the CEC to increase EV charging infrastructure and CARB to provide rebates for the purchase of new EVs and purchase incentives for low-income customers.

Solid Waste

AB 939 and AB 341. In 1989, AB 939, known as the Integrated Waste Management Act (Public Resources Code Sections 40000 et seq.), was passed because of the increase in waste stream and the decrease in landfill capacity. The statute established the California Integrated Waste Management Board, which oversees a disposal reporting system. AB 939 mandated a reduction of waste being disposed where jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by 2000.

AB 341 (2011) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by 2020, and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the state’s policy goal. CalRecycle has conducted multiple workshops and published documents that identify priority strategies that CalRecycle believes would assist the state in reaching the 75% goal by 2020 (CalRecycle 2015).

Water

EO B-29-15. In response to the ongoing drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the executive order extended through February 28, 2016, although many of the directives have since become permanent water-efficiency standards and requirements. The executive order includes specific directives that set strict limits on water usage in the state. In

response to EO B-29-15, the California Department of Water Resources modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increases the requirements for landscape water use efficiency and broadens its applicability to include new development projects with smaller landscape areas.

Other State Regulations and Goals

SB 97. SB 97 (2007) directed the Governor’s Office of Planning and Research to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, the Governor’s Office of Planning and Research issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project’s GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities. The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant (OPR 2008).

Subsequent to the release of the Governor’s Office of Planning and Research’s advisory and its development of proposed CEQA Guidelines provisions, the California Natural Resources Agency adopted CEQA Guidelines amendments in December 2009, which became effective in March 2010. With respect to GHG emissions, the amended CEQA Guidelines state that lead agencies should “make a good faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate” GHG emissions. The CEQA Guidelines note that lead agencies may identify emissions by either selecting a “model or methodology” to quantify the emissions or by relying on “qualitative analysis or other performance based standards” (14 CCR 15064.4(a)). The amended CEQA Guidelines also state that lead agencies should consider the following when assessing the significance of impacts from GHG emissions on the environment: the extent a project may increase or reduce GHG emissions as compared to the existing environmental setting; whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)).

2015 State of the State Address. Governor Brown’s 2015 inaugural address and annual report to the Legislature established supplementary goals to further reduce GHG emissions over the next 15 years. These goals include increasing California’s renewable energy portfolio from 33% to 50% (which was codified per SB 350, as discussed above), reducing vehicle petroleum use for cars and trucks by up to 50%, doubling the efficiency of existing buildings, and decreasing emissions associated with heating fuels.

2016 State of the State Address. In his January 2016 address, Governor Brown established a statewide goal to bring per capita GHG emission down to two tons per person, which reflects the goal of the Global Climate Leadership Memorandum of Understanding (Under 2 MOU) to limit global warming to less than two degrees Celsius by 2050. The Under 2 MOU agreement pursues emission reductions of 80% to 95% below 1990 levels by 2050 and/or reach a per-capita annual emissions goal of less than 2 MT by 2050. A total of 135 jurisdictions, including California, representing 32 countries and 6 continents, have signed or endorsed the Under 2 MOU (Under 2 2016)..

2.7.2.3 Local

San Diego Air Pollution Control District

The San Diego Air Pollution Control District does not have established GHG rules, regulations, or policies.

County of San Diego

Climate Action Plan

The County has developed a Climate Action Plan (CAP) that is a comprehensive strategy to reduce GHG emissions in the unincorporated communities of San Diego County. A draft CAP was released on August 10, 2017, for public review. The plan includes six chapters: (1) Introduction; (2) Greenhouse Gas Emissions Inventory, Projections, and Reductions Targets; (3) Greenhouse Gas Reduction Strategies and Measures; (4) Climate Change Vulnerability, Resiliency, and Adaptation; (5) Implementation and Monitoring; and (6) Public Outreach and Engagement. Concurrent with the release of the Draft CAP, the County published implementation tools for the County to use when conducting CEQA analysis. This includes a general plan land use conformity determination and CAP Consistency review checklist. In January 2018, the Planning Commission recommended adoption of the final CAP to the County Board of Supervisors. On February 14, 2018, the County Board of Supervisors adopted the CAP.

Strategic Plan to Reduce Waste

The County of San Diego Strategic Plan to Reduce Waste outlines near-, mid-, and long-term programs and policies to increase the County's solid waste diversion rate to meet state targets and support other County initiatives, such as the CAP. In April 2017, the County adopted a diversion goal of 75% by 2025 (County of San Diego 2017a).

Renewable Energy Plan

The County's Renewable Energy Plan researches and develops renewable energy options in the County. The planning effort covers the residential, commercial, and industrial sectors of the

County, with a particular focus on unincorporated areas, and presents a comprehensive approach to renewable energy and energy efficiency (County of San Diego 2017b).

General Plan

The County's General Plan (County of San Diego 2011) includes smart growth and land use planning principles designed to reduce vehicle miles traveled (VMT) and result in a reduction in GHG emissions. Climate change and GHG reduction policies are addressed in plans and programs in multiple elements of the General Plan.

The strategies for reduction of GHG emissions in the General Plan are as follows (County of San Diego 2011):

- **Strategy A-1:** Reduce vehicle trips generated, gasoline/energy consumption, and GHG emissions.
- **Strategy A-2:** Reduce non-renewable electrical and natural gas energy consumption and generation (energy efficiency).
- **Strategy A-3:** Increase generation and use of renewable energy sources.
- **Strategy A-4:** Reduce water consumption.
- **Strategy A-5:** Reduce and maximize reuse of solid wastes.
- **Strategy A-6:** Promote carbon dioxide consuming landscapes.
- **Strategy A-7:** Maximize preservation of open spaces, natural areas, and agricultural lands.

The General Plan also includes climate adaptation strategies to deal with potential adverse effects of climate change. The climate adaptation strategies include the following (County of San Diego 2011):

- **Strategy B-1:** Reduce risk from wildfire, flooding, and other hazards resulting from climate change.
- **Strategy B-2:** Conserve and improve water supply due to shortages from climate change.
- **Strategy B-3:** Promote agricultural lands for local food production.
- **Strategy B-4:** Provide education and leadership.

The County General Plan's Conservation and Open Space Element also includes goals and policies that are designed to reduce GHGs emissions by enhancing the efficiency of energy use in buildings and infrastructure, promoting the use of renewable energy sources and conservation, and other methods of efficiency. The pertinent goals are identified below; please refer to

Appendix 2.7-1 and Table 2.7-3, County of San Diego General Plan – Project Consistency Analysis, below, for the pertinent supporting policies.

- **Goal COS-14, Sustainable Land Development.** Land use development techniques and patterns that reduce emissions of criteria pollutants and GHGs through minimized transportation and energy demands, while protecting public health and contributing to a more sustainable environment.
- **Goal COS-15, Sustainable Architecture and Buildings.** Building design and construction techniques that reduce emissions of criteria pollutants and GHGs, while protecting public health and contributing to a more sustainable environment.
- **Goal COS-16, Sustainable Mobility.** Transportation and mobility systems that contribute to environmental and human sustainability and minimize GHG and other air pollutant emissions.
- **Goal COS-17, Sustainable Solid Waste Management.** Perform solid waste management in a manner that protects natural resources from pollutants while providing sufficient, long term capacity through vigorous reduction, reuse, recycling, and composting programs.
- **Goal COS-18, Sustainable Energy.** Energy systems that reduce consumption of non-renewable resources and reduce GHG and other air pollutant emissions while minimizing impacts to natural resources and communities.
- **Goal COS-19, Sustainable Water Supply.** Conservation of limited water supply supporting all uses including urban, rural, commercial, industrial, and agricultural uses.
- **Goal COS-20, Governance and Administration.** Reduction of local GHG emissions contributing to climate change that meet or exceed requirements of the Global Warming Solutions Act of 2006.

The Proposed Project’s consistency with the General Plan is evaluated below in Section 2.7.3.2, and in Section 3.3, Land Use and Planning, of this EIR.

2.7.3 Analysis of Project Effects and Determination as to Significance

The significance criteria used to evaluate the Proposed Project’s GHG emissions impacts are based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this GHG emissions analysis, the Proposed Project would have a significant environmental impact if it would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Subsections 2.7.3.1 and 2.7.3.2 address the significance criteria in Appendix G of the CEQA Guidelines related to GHG emissions. Section 2.7.3.1 evaluates the Proposed Project's GHG emissions resulting from the Proposed Project's construction, land use change (vegetation removal), operational activities, and gain of sequestered carbon from tree plantings. Section 2.7.3.2 assesses whether the Proposed Project conflicts with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

In evaluating the Proposed Project relative to the Appendix G criteria, this analysis considers the provisions of CEQA Guidelines Section 15064.4(b), which directs that "a lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment: (1) the extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether project emissions exceed a threshold of significance that the lead agency determines applies to the project; and, (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions."

2.7.3.1 Generate Greenhouse Gas Emissions, Either Directly or Indirectly, that May Have a Significant Impact on the Environment

Guidelines for the Determination of Significance

Based on Appendix G of the CEQA Guidelines, the Proposed Project would have a significant impact if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

Analysis

Regulatory Compliance Measures and Project Design Features that Reduce GHG Emissions

The Proposed Project would be required to comply with numerous regulations that reduce GHG emissions. Table 2.7-4, Regulatory Compliance Measures that Reduce GHG Emissions, identifies applicable regulations and associated quantification details, where applicable.

The Proposed Project also includes PDFs that would reduce GHG emissions through the design of the Project Area's uses, including the transportation network. Table 2.7-5, Project Design Features that Reduce GHG Emissions, identifies the PDFs and associated quantification details, where applicable.

Because the reduction benefits of regulatory compliance measures and PDFs are not always readily quantifiable, the emissions inventory estimates presented in this section provide a conservative representation of Proposed Project emissions.

Construction and Land Use Change GHG Emissions

Emissions from the construction phase of the Proposed Project were estimated using CalEEMod Version 2016.3.1. Detailed information regarding the methodology used to estimate the Proposed Project's construction-related GHG emissions is provided in Section 4.2 (Construction Emissions Methodology) of Appendix 2.7-1; a brief summary of the methodology is provided below.

Proposed Project construction activities are anticipated to commence in 2019 and would last approximately 9 years, ending in 2027. See Section 4.2.1 (Overall Schedule) of Appendix 2.7-1 for additional information regarding the phasing assumptions used when estimating Proposed Project construction emissions.

The equipment mix anticipated for construction was based on information provided by the applicant's representatives and best engineering judgment. The equipment mix is meant to represent a reasonably conservative estimate of construction activity. General construction equipment modeling assumptions are provided in Section 4.2.3 (Residential Development Phasing and Equipment) and Section 4.2.4 (Non-Residential Development Phasing and Equipment) of Appendix 2.7-1.

Cut-and-fill quantities would be balanced on site (within the Project Area), and no external soil export would be required. South Proctor Valley Road would include transport of 240,000 cubic yards from South Village 14, with 50% of the import hauled by 100-ton trucks, as explained below. All other balancing activities are anticipated to be performed through the use of off-road construction equipment (e.g., excavators, graders, dozers, and scrapers). However, to provide a degree of conservatism in the analysis, 2% of soil was assumed to be transported by a 12-cubic-yard haul truck within the Project Area at an average hauling distance of 0.5 miles.

To construct South Proctor Valley Road, approximately 240,000 cubic yards of fill would be transported from South Village 14 to South Proctor Valley Road. For purposes of this analysis, 120,000 cubic yards (50%) of that total are assumed to be transported using 100-ton rock trucks, which are categorized as off-highway trucks in CalEEMod. These off-highway trucks would transport fill from South Village 14 to the farthest reaches of Proctor Valley

Road. Off-road construction equipment, such as graders and scrapers, would move the remaining 120,000 cubic yards (50%) of that total from South Village 14 to the closest portions of Proctor Valley Road. Four off-highway trucks operating at 8 hours per day was assumed to be required to transport 120,000 cubic yards over 19 days was assumed. See Section 4.2.2 (Mass Project Area Grading) of Appendix 2.7-1 for additional information regarding the South Proctor Valley Road construction.

Rock crushing also would occur as part of the site preparation process. The rock-crushing equipment was assumed to consist of a crusher, screen, and conveyor, and the crushed rock would be stockpiled for future use. It is expected that the rock-crushing equipment would be powered by a diesel engine generator rated at 750 kilowatts, or approximately 1,000 horsepower. GHG emissions from the rock-crushing equipment were estimated using CalEEMod, and it was assumed that all equipment would operate 8 hours per day, 5 days per week, over each phase. It was assumed that the same equipment would be used for each phase; thus, the emission factors were based on the initial year of use (2019). Construction of the Proposed Project would also include blasting, as discussed in Section 2.3, Air Quality. However, pursuant to EPA AP-42, Section 13.3 Explosives Detonation, there are no CO₂ or CH₄ emission factors for the explosive ammonium nitrate fuel oil. Accordingly, GHG emissions associated with blasting were not included in this GHG analysis.

Table 2.7-6, Estimated Annual Construction GHG Emissions, shows the estimated annual GHG construction emissions associated with the Proposed Project by year. As shown in Table 2.7-6, estimated total Proposed Project-generated construction GHG emissions are approximately 11,463 MT CO₂e.

The calculation methodology and default values provided in CalEEMod (CAPCOA 2016) were used to calculate potential CO₂ emissions associated with the one-time change in carbon sequestration capacity. The calculation of the one-time loss of sequestered carbon is the product of the converted acreage value and the carbon content value for each land use type (vegetation community). The one-time sequestration loss from land use conversion (i.e., vegetation removal) in the Project Area was calculated at 10,382 MT CO₂e, as shown in Table 2.7-7, Vegetation Removal – Estimated Loss of Sequestered Carbon.

As shown in Table 2.7-8, Estimated Total Construction and Vegetation Removal GHG Emissions, the estimated combined emissions for the construction activities (about 11,436 MT CO₂e) and vegetation removal (about 10,382 MT CO₂e) is approximately 21,845 MT CO₂e. The “project life” is assumed to be 30 years, consistent with the 30-year lifetime used by the South Coast Air Quality Management District’s GHG guidance (SCAQMD 2008). Accordingly, the amortized GHG emissions over the lifetime of the Proposed Project (30 years) would be approximately 728 MT CO₂e per year.

As explained in Chapter 1, Project Description, the Proposed Project includes an option for additional bike lanes to be constructed on Proctor Valley Road North if selected by the San Diego County Board of Supervisors. Construction of these bike lanes would require approximately 20,000 cubic yards of grading, 65,000 square feet of paving, and associated architectural coating for striping and bike lane signage. If constructed, it is expected that the additional grading, paving, and architectural coating associated with the bike lane option would use the same construction equipment used for off-site improvements, and would result in a maximum of 9 additional days of construction. The additional construction activities were modeled separately in CalEEMod to estimate potential additional emissions resulting from equipment operation and worker trips. No additional haul-truck trips would be required for the Proctor Valley Road North Option. In 2022, emissions would increase by 9.27 MT CO₂e if the Proctor Valley Road North Option is selected.

The Perimeter Trail Option, if selected by the San Diego County Board of Supervisors, would provide for an improved trail around the Project Area. Because this Perimeter Trail Option would be graded during the Development Footprint mass-grading phase, no additional grading is anticipated for this option, and no additional GHG emissions are anticipated to occur. The Preserve Trails Option would not result in any improvements and, thus, no additional emissions would occur.

Because there is no separate GHG threshold for construction, the evaluation of significance is discussed in the operational emissions analysis below.

Operational GHG Emissions

Area Sources

CalEEMod was used to estimate operational emissions from area sources, which include emissions from landscape maintenance equipment. Although electric equipment for landscaping maintenance activities could be used by future residents and/or homeowner's association landscape maintenance contractors, default CalEEMod assumptions were used in estimating emissions as a conservative estimate.

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage (non-hearth). Emissions were calculated by multiplying the energy use by the utility's carbon intensity. Annual natural gas and electricity emissions were estimated in CalEEMod using the emissions factors for San Diego Gas and Electric (SDG&E), which would be the energy source provider for the Proposed Project. For the operational year 2028, the emission factors for SDG&E were adjusted to reflect SDG&E's compliance with the

RPS standards. A renewable procurement percentage of 46.6% in 2028 was interpolated from the 2020 RPS goal of 33% and 2030 goal of 50%.

For residential land uses, Proposed Project energy use (electricity and natural gas) data was used in place of CalEEMod default values (ConSol 2017). To calculate the total residential building energy input, Proposed Project energy use data prepared by ConSol, which reflected energy use in residential development designed to meet the CEC's definition of ZNE buildings, was used. (ZNE buildings are designed to achieve enhanced energy efficiency in the building envelope and to use renewable energy sources, such as rooftop-mounted solar panels.) These energy data were calculated using the CEC's public-domain compliance software, known as CBECC-Res.⁵ The residential energy use (electricity and natural gas) rates input to CalEEMod are presented in Section 4.3.2 (Energy Sources) of Appendix 2.7-1.

The current Title 24 building energy efficiency standards⁶ are the 2016 Title 24 building energy efficiency standards, which became effective on January 1, 2017. In general, non-residential buildings built to the 2016 standards will use an estimated 5% less energy than those built to the 2013 standards (CEC 2015a). CalEEMod default values assume compliance with the 2013 Title 24 standards, which became effective on July 1, 2014. In accordance with PDF-AQ/GHG-3, non-residential land uses were adjusted to meet 10% greater building energy efficiency than required by the 2016 state energy efficiency standards in Title 24.

As described in Chapter 1, construction of a 9.7-acre elementary school site may be replaced by 97 residential units, contingent on the future needs of the Chula Vista Elementary School District. To account for this uncertainty regarding the school site, the Proposed Project is assessed as one of two possible scenarios, or both, for each environmental topic in this EIR. The two scenarios are as follows: 1,119 residential units and no elementary school, or 1,022 residential units and an elementary school. The scenario chosen to be analyzed for each environmental topic is the worst-case scenario for potential significant impacts.

The Proposed Project also would include three swimming pools at the private recreation centers. Energy demand for swimming pools was estimated using a baseline demand for pools in the SDG&E service area (SCE 2016). On-site energy demand would be reduced by installing solar heating at all recreational swimming pools.

⁵ "CBECC-Res" is shorthand for California Building Energy Code Compliance – Residential.

⁶ Title 24, part 6 of the California Code of Regulations.

Mobile Sources

Mobile sources for the Proposed Project would primarily be motor vehicles (automobiles and light-duty trucks) traveling to and from the proposed land uses. The anticipated Proposed Project trip generation, including the trip rates and total trips, is based on the Proposed Project's Transportation Impact Analysis prepared by Chen Ryan (Appendix 2.9-1). CalEEMod was used to calculate the emissions resulting from on-road mobile sources associated with residents, workers, customers, and delivery vehicles traveling to and from the proposed land use types. Please see Section 4.3.3 (Mobile Sources) of Appendix 2.7-1 for a detailed discussion of the methodology used to estimate emissions from mobile sources.

Because the Proposed Project would implement a Transportation Demand Management (TDM) program, the Proposed Project's transportation engineer (Chen Ryan) quantified the reduction in VMT attributable to implementation of the TDM-related strategies. Please see Table 15 in Appendix 2.7-1 for additional information regarding the VMT reduction benefits of the TDM program, which was then accounted for in the GHG emissions estimates provided for mobile sources by CalEEMod. Based on the estimated VMT reductions, the TDM program would achieve an overall 4.3% reduction in the Proposed Project's total VMT.

The Proposed Project would also include a multi-pronged approach to increase EV adoption for residents. As part of this strategy, Level 2 EV Supply Equipment would be installed in half of all residential units (560 units), and 10 parking spaces located in the Village Core's commercial development area and P1 through P4 park areas would include charging stations. These strategies—in conjunction with market forces decreasing the cost and increasing the availability of EVs, regional charging initiatives decreasing range anxiety and increasing the share of miles driven by plug-in hybrid electric vehicles in EV mode, and state targets fueling programs and incentive pools making EV ownership more cost effective and appealing—will increase the market penetration of EVs and share of EV miles driven as a result of the Proposed Project. However, conservatively, no reduction for EV charging was assumed.

Solid Waste

The Proposed Project would generate solid waste, and, therefore, result in CO₂e emissions associated with landfill off-gassing. A waste disposal rate of 3.6 tons per day was assumed in CalEEMod for the Proposed Project, consistent with Section 3.1.8, Utilities and Service Systems, of this EIR. It was conservatively assumed that a 75% reduction in solid waste per the requirements of AB 341 and the County's 2025 diversion goal was incorporated into the rate of 3.6 tons per day, and no additional reduction in GHG emissions was assumed relative to waste diversion.

Water and Wastewater

Supply, conveyance, treatment, and distribution of water for the Proposed Project would require the use of electricity, which would result in associated indirect GHG emissions. Similarly, wastewater generated by the Proposed Project would require the use of electricity for conveyance and treatment, along with GHG emissions generated during wastewater treatment. Water consumption estimates for indoor and outdoor water use and associated electricity consumption from water use and wastewater generation were estimated using the Proposed Project's Water Conservation Plan (Appendix 3.1.2-3 of this EIR).⁷

Carbon Sequestration

The calculation methodology and default values provided in CalEEMod were used to estimate the one-time carbon-stock change from planting new trees. Trees sequester CO₂ while they are actively growing, and the amount of CO₂ sequestered depends on the type of tree. The accumulation of CO₂ in biomass slows with age, in addition to losses from clipping, pruning, and tree death. The gain of sequestered CO₂ resulting from planting and growth of approximately 8,000 miscellaneous trees in the Project Area was estimated based on the carbon sequestration rate for the tree species, the number of new trees, and the growing period. See below for more detail.

Estimated Operational GHG Emissions

As shown in Table 2.7-9, Estimated Annual Operational GHG Emissions (2028), Proposed Project GHG emissions generated from operational activities are estimated to be approximately 16,384 MT CO₂e per year in 2028. However, the Proposed Project would contribute to the sequestration of carbon by planting 8,000 new trees. As shown in Table 2.7-10, Planted Trees – Estimated Gain of Sequestered Carbon, the estimated one-time carbon-stock change resulting from proposed planting of 8,000 trees new is approximately 5,664 MT CO₂, which results in approximately 189 MT CO₂ per year when amortized over 30 years. Therefore, estimated annual Proposed Project operational GHG emissions of approximately 16,384 MT CO₂e per year, minus the estimated amortized sequestered carbon of approximately 189 MT CO₂ per year from tree plantings, results in net annual operational GHG emissions of approximately 16,195 MT CO₂e per year. Proposed Project operational emissions and carbon gain are presented in Table 2.7-11, Estimated Operational Annual Net GHG Emissions (2028).

⁷ It was assumed that 50% of the Proposed Project's water usage would be indoor water use and 50% would be outdoor use for all land uses, with the exception of parks. Park water usage is assumed to be 100% outdoor water use, with no indoor water use.

Note that post-2028 amendments to the regulatory framework quantitatively accounted for in this section's GHG emissions estimates, such as stricter RPS standards, would lessen the Proposed Project's annual GHG emissions over time. As such, emissions estimates provided in Table 2.7-9 are conservative because the Proposed Project's GHG emissions are expected to decrease beyond the estimates presented here, due, in part, to reasonably foreseeable improvements in fuel efficiency, fleet turnover, and other technological improvements related to transportation and energy. It also is anticipated that CARB, the CEC, and other state, regional, and local agencies will enact new or enhanced regulations prior to the Proposed Project's build-out year to reduce GHG emissions in furtherance of the state's GHG reduction policy goals.

Because the Proposed Project would increase GHG emissions above the existing emissions level, the Proposed Project (without mitigation) would generate GHG emissions during operation that may have a significant impact on the environment, and impacts related to GHG emissions would be **potentially significant (Impact GHG-1)**.

2.7.3.2 Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of Greenhouse Gases

Guidelines for the Determination of Significance

Based on Appendix G of the CEQA Guidelines, the Proposed Project would have a significant impact if it would:

- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Analysis

Consistency with SANDAG'S 2050 RTP/SCS

Regarding consistency with SANDAG's Regional Plan, as discussed above, the Proposed Project is part of the planned and approved Otay Ranch GDP/SRP. This master plan, approved in 1993 as a joint planning effort by the City of Chula Vista and the County of San Diego, encompasses 23,000 acres arranged in a series of villages to be developed over a 50-year period. The Otay Ranch vision and plan contains a mix of residential, commercial, civic, recreational, and public facilities, along with more than 11,000 acres of Otay Ranch RMP/MSCP (MSCP) Preserve, all of which were designed to reduce the amount of VMT and corresponding GHG emissions of the master-planned community. Development of the Project Area has been anticipated by the County and other agencies (such as SANDAG) since approval of the Otay Ranch GDP/SRP in 1993.

The Proposed Project itself also includes PDFs developed to support the policy objectives of SANDAG's RTP/SCS and SB 375. For instance, the Proposed Project's TDM program is estimated to achieve a 4.3% reduction in total VMT. Elements of the TDM program include an integrated walking and bicycling trail system that would connect the various components of the Proposed Project. Traffic-calming design and dedicated space for non-automotive traffic would create safe and appealing environments for residents to use. The Proposed Project would also include parks and recreational facilities within safe walking or biking distance for residents. Ride-sharing and commute programs would decrease the number of trips for single-occupancy vehicles for daily trips outside of the Project Area to regional transportation hubs and job centers in adjacent Chula Vista. Additionally, EV Supply Equipment would be provided in half of all residential garages, and public charging stations would be provided within the Village Core and park areas.

Table 2.7-12, San Diego Forward: The Regional Plan Consistency Analysis, further illustrates the Proposed Project's consistency with applicable goals and policies of San Diego Forward: The Regional Plan (SANDAG 2015).

Consistency with the County of San Diego General Plan

Table 2.7-3 outlines the Proposed Project's consistency with applicable policies set forth in the County's Conservation and Open Space Element of the General Plan that are designed to reduce the emissions of GHGs; reduce energy use in buildings and infrastructure; and promote the use of renewable energy sources, conservation, and other methods of efficiency. As shown in Table 2.7-3, the Proposed Project is consistent with applicable policies.

Consistency with SB 32 and S-3-05

As discussed in Section 2.7.2, EO S-3-05 and SB 32 are as follows:

- **EO S-3-05** establishes the following goals: GHG emissions should be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.
- **SB 32** establishes a reduction target to reduce statewide GHG emissions to at least 40% below 1990 levels by 2030.

This section evaluates whether the GHG emissions trajectory after Proposed Project completion would impede the attainment of the 2030 and 2050 GHG reduction goals identified in SB 32 and EO S-3-05.

CARB has expressed optimism with regard to both the 2030 and 2050 goals. CARB states in the First Update that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32" (CARB

2014, p. ES2). With regard to the 2050 target for reducing GHG emissions to 80% below 1990 levels, the First Update states the following (CARB 2014, p. 34):

This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80% below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

In other words, CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, EO B-30-15, and EO S-3-05. This is confirmed in the Second Update, which states (CARB 2017b, p. 7):

The Proposed Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while also identifying new, technologically feasibility and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities. The Proposed Plan is developed to be consistent with requirements set forth in AB 32, SB 32, and AB 197.

As discussed in Section 2.7.3.2, total Proposed Project emissions, including operation and amortized construction, would be approximately 16,923 MT CO₂e per year. Therefore, the Proposed Project (without mitigation) would generate GHG emissions that may interfere with the implementation of GHG reduction goals for 2030 and 2050 and, therefore, would potentially conflict with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. This would be a **potentially significant impact (Impact GHG-2)**.

2.7.4 Cumulative Impact Analysis

Due to the global nature of the assessment of GHG emissions and the effects of global climate change, impacts can currently only be analyzed from a cumulative impact context; therefore, this EIR's analysis includes the assessment of Proposed Project impacts as a cumulative impact.

2.7.5 Significance of Impacts Prior to Mitigation

Based on the analysis presented herein, the Proposed Project would have the following significant impacts prior to mitigation:

Impact GHG-1 The Proposed Project would generate GHG emissions that may have a significant impact on the environment.

Impact GHG-2 The Proposed Project would generate GHG emissions that may interfere with the implementation of GHG reduction goals for 2030 and 2050.

2.7.6 Mitigation

For purposes of this analysis, Table 2.7-5 lists the Proposed Project's PDFs that reduce GHG emissions. The County has determined that additional on-site and off-site mitigation can further reduce impacts from GHG emissions to a less-than-significant level through implementation of GHG emissions reduction strategies and through the purchase of carbon offsets. Collectively, implementation of mitigation measures **M-GHG-1** through **M-GHG-4**, as set forth below, would result in the Proposed Project offsetting 100% of its annual GHG emissions to achieve carbon neutrality (i.e., a net-zero emissions level). **M-GHG-1** and **M-GHG-2** would require the Proposed Project to offset 100% of its construction and operational GHG emissions. The use of carbon offsets to mitigate GHG emissions is expressly authorized by CEQA Guidelines Section 15126.4(c)(3)-(c)(4), and would reduce impacts associated with GHG emissions to a less-than-significant level. **M-GHG-3** would require that residential structures be equipped with electrical outlets in the front and rear of the structures to facilitate use of electrical lawn and garden equipment. **M-GHG-4** ensures that the PDFs will be implemented to further reduce potential GHG emissions. The following mitigation would reduce **Impacts GHG-1** and **GHG-2** to **less than significant**.

M-GHG-1 As to construction greenhouse gas (GHG) emissions, prior to the County of San Diego's (County) issuance of each grading permit, the Proposed Project applicant or its designee shall purchase and retire carbon offsets in a quantity sufficient to offset 100% of the Proposed Project's construction emissions (including sequestration loss from vegetation removal) associated with each such grading permit, consistent with the performance standards and requirements set forth below.

First, "carbon offset" shall mean an instrument issued by any of the following: (i) the Climate Action Reserve, the American Carbon Registry, and the Verified Carbon Standard; (ii) any registry approved by the California Air Resources Board (CARB) to act as a registry under the state's cap-and-trade program; or (iii) if no registry is in existence as identified in options (i) and (ii), above, then any other reputable registry or entity that issues carbon offsets.

Second, any carbon offset used to reduce the Proposed Project's greenhouse gas (GHG) emissions shall be a carbon offset that represents the past reduction or

sequestration of one metric ton of carbon dioxide equivalent that is “not otherwise required” (CEQA Guidelines Section 15126.4(c)(3)).

Third, “Proposed Project applicant” shall mean Jackson Pendo Development Company’s or its designee.

Fourth, as to construction and from vegetation removal GHG emissions, prior to the County’s issuance of each grading permit, the Proposed Project applicant or its designee shall provide evidence to the satisfaction of the Director of the Planning & Development Services Department (PDS) that the Proposed Project applicant has purchased and retired carbon offsets in a quantity sufficient to offset 100% of the construction GHG emissions and sequestration loss from vegetation removal generated by the Proposed Project, as associated with each such grading permit. The emissions reduction obligation associated with each grading permit shall be calculated by reference to the certified environmental impact report’s Greenhouse Gas Emissions Technical Report (Appendix 2.7-1), which determined total construction-related emissions as equaling 21,845 metric tons of carbon dioxide equivalent. This would increase to 21,854 MT CO₂e if the Proctor Valley Road North Option is selected.

Fifth, the purchased carbon offsets used to reduce construction and vegetation removal GHG emissions shall achieve real, permanent, quantifiable, verifiable, and enforceable reductions (California Health & Safety Code Section 38562(d)(1)).

Sixth, the County of San Diego Planning & Development Services shall consider, to the satisfaction of the Director of PDS, the following geographic priorities for GHG reduction features, and GHG reduction projects and programs: (1) project design features/on-site reduction measures; (2) off-site within the unincorporated areas of the County of San Diego; (3) off-site within the County of San Diego; (4) off-site within California; (5) off-site within the United States; and (6) off-site internationally. As listed, geographic priorities would focus first on local reduction features (including projects and programs that would reduce GHG emissions) to ensure that reduction efforts achieved locally would provide cross-over benefits related to air quality criteria pollutant reductions within the San Diego Air Basin, and to aid in San Diego County jurisdictions’ efforts to meet their GHG reduction goals. The Proposed Project applicant or its designee shall first pursue offset projects and programs locally within unincorporated areas of the County of San Diego to the extent such offset projects and programs are financially competitive in the global offset market.

M-GHG-2 As to operational greenhouse gas (GHG) emissions, prior to the County of San Diego's (County) issuance of building permits for each implementing Site Plan ("D" Designator), the applicant or its designee shall purchase and retire carbon offsets for the incremental portion of the Proposed Project within the Site Plan in a quantity sufficient to offset, for a 30-year period, the operational greenhouse gas (GHG) emissions from that incremental amount of development to net zero, consistent with the performance standards and requirements set forth below.

First, "carbon offset" shall have the same meaning as set forth in M-GHG-1.

Second, any carbon offset used to reduce the Proposed Project's GHG emissions shall be a carbon offset that represents the past reduction or sequestration of 1 metric ton of carbon dioxide equivalent that is "not otherwise required" (CEQA Guidelines Section 15126.4(c)(3)).

Third, the Proposed Project applicant shall have the same meaning as set forth in M-GHG-1.

Fourth, as to operational emissions, prior to the County of San Diego's issuance of building permits for each implementing Site Plan ("D" Designator), the Proposed Project applicant or its designee shall provide evidence to the satisfaction of the Director of Planning & Development Services Department (PDS) that it has purchased and retired carbon offsets for the incremental portion of the Proposed Project within the Site Plan in a quantity sufficient to offset, for a 30-year period, the operational GHG emissions from the incremental amount of development to net zero. The "project life" is 30 years. This methodology is consistent with the 30-year project life time frame used by the South Coast Air Quality Management District's GHG guidance (SCAQMD 2008). The emissions reduction obligation associated with each building permit shall be calculated by reference to the certified environmental impact report's (EIR) Greenhouse Gas Emissions Technical Report (Appendix 2.7-1), which determined total construction-related emissions as equaling 16,159 metric tons of carbon dioxide equivalent (MT CO_{2e}) annually, which equates to 484,770 MT CO_{2e} over 30 years.

Fifth, the purchased carbon offsets used to reduce operational GHG emissions shall achieve real, permanent, quantifiable, verifiable, and enforceable reductions (California Health & Safety Code Section 38562(d)(1)).

Sixth, the amount of carbon offsets required for each implementing Site Plan shall be based on the GHG emissions with the implementing Site Plan, and shall

include operational GHG emissions as identified in the approved Greenhouse Gas Emissions Technical Report.

Seventh, each implementing Site Plan shall include a tabulation that identifies the overall carbon offsets required to mitigate the entire Proposed Project's GHG emissions, and shall identify the amount of carbon offsets purchased to date, as well as the remaining carbon offsets required to reduce the Proposed Project's emissions to net zero. Such tabulation and tracking shall be to the satisfaction of the Director of PDS.

Eighth, this EIR acknowledges that the Proposed Project's GHG emissions estimates are conservative because the Proposed Project's GHG emissions are expected to decrease beyond the estimates presented in the EIR's analysis, in part, due to reasonably foreseeable improvements in fuel efficiency, vehicle fleet turnover, technological improvements related to transportation and energy, and updates to emissions models and methodologies. Thus, subject to County oversight, the operational emissions estimates that govern implementation of the Proposed Project are subject to a "true up" at the election of the Proposed Project applicant (as defined above) or its designee and subject to the satisfaction of the Director of PDS. Specifically, if new technological advancements, regulatory updates, or model and methodology updates occurring at a future date result in greater GHG efficiencies and less impacts from Proposed Project operations than the information projected in the certified Final EIR for the Proposed Project, and a "true-up" exercise is undertaken, the Proposed Project applicant or its designee shall provide an operational GHG emissions inventory of the Proposed Project's operational emissions for the "true-up" operational conditions, including emissions from mobile sources, energy, area sources, water consumption, and solid waste. If updated GHG emissions calculations are conducted for the "true-up" exercise at the Proposed Project applicant's or its designee's election, subject to the satisfaction of the Director of PDS, these calculations shall be conducted using a County-approved model and/or methodology. Alternatively, the Proposed Project applicant may purchase all carbon offset credits to reduce operational GHG emissions at issuance of the first building permit.

The "true-up" operational GHG emissions inventory, if conducted, shall be provided in the form of a project-specific Updated Emissions Inventory and Offset Report to the County's Director of PDS (or its designee) prior to the issuance of building permits for the next buildout phase of the Proposed Project. The subject technical documentation shall be prepared by a County-approved, qualified air quality and GHG technical specialist. If the Director of PDS (or its

designee) determines that the technical documentation demonstrates that the quantity of Proposed Project GHG emissions would be lower than the quantity identified in the certified Final EIR for the Proposed Project, and finds that the technical documentation is supported by substantial evidence, the Director of PDS may authorize a reduction in the total carbon offsets value required for the Proposed Project. In all instances, substantial evidence must confirm that any reduction to the total carbon offsets value as identified in the certified Final EIR for the Proposed Project is consistent with the Proposed Project commitment to achieve and maintain carbon neutrality (i.e., net zero emissions) for the 30-year life of the Proposed Project.

Ninth, PDS will consider, to the satisfaction of the Director of PDS, the following geographic priorities for GHG reduction features, and GHG reduction projects and programs: (1) project design features/on-site reduction measures, (2) off-site within the unincorporated areas of the County of San Diego, (3) off-site within the County of San Diego, (4) off-site within California, (5) off-site within the United States, and (6) off-site internationally. As listed, geographic priorities would focus first on local reduction features (including projects and programs that would reduce GHG emissions) to ensure that reduction efforts achieved locally would provide cross-over benefits related to air quality criteria pollutant reductions within the San Diego Air Basin, and to aid in San Diego County jurisdictions' efforts to meet their GHG reduction goals. The Proposed Project applicant or its designee shall first pursue offset projects and programs locally within unincorporated areas of the County of San Diego to the extent such offset projects and programs are financially competitive in the global offset market.

M-GHG-3 Prior to the issuance of residential building permits, the applicant or its designee shall provide evidence to the County of San Diego that the design plans for residential structures include electrical outlets in the front and rear of the structure to facilitate use of electrical lawn and garden equipment.

M-GHG-4 To reduce greenhouse gas emissions, the applicant or its designee shall provide evidence to the County of San Diego that the following project design features identified for the Proposed Project herein will be implemented: PDF-AQ/GHG-1, PDF-AQ/GHG-2, PDF-AQ/GHG-3, PDF-AQ/GHG-4, PDF-AQ/GHG-5, PDF-AQ/GHG-6, PDF-TR-1, PDF-UT-1, PDF-UT-2, PDF-UT-3, and PDF-UT-4.

2.7.7 Conclusion

As previously noted in Section 2.7.2.2, CARB’s Second Update states that “achieving no net increase in GHG emissions is the correct overall objective” for project-level CEQA analysis, but also recognizes that such a standard may not be appropriate or feasible for every development project (CARB 2017b). In this case, and as shown in Table 2.7-13, Estimated Net GHG Emissions (2028), the Proposed Project feasibly can achieve no net increase in GHG emissions through implementation of **M-GHG-1** through **M-GHG-4**. Accordingly, the Proposed Project would not interfere with implementation of statewide GHG reduction goals for 2030 or 2050. Further, as previously discussed, the Proposed Project’s emissions estimates are a conservative representation of Proposed Project emissions due to the reasonably foreseeable and anticipated technological and regulatory advancements that will continue to advance the state’s GHG policies. In closing, through mitigation, the Proposed Project would reduce all potentially significant impacts (**Impacts GHG-1** and **GHG-2**) associated with GHG emissions to **less than significant** at both the project level and cumulative impact level.

**Table 2.7-1
Greenhouse Gas Emissions Sources in California**

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total ^a
Transportation	164.63	37%
Industrial ^b	91.71	21%
Electricity generation ^c	83.67	19%
Residential and commercial uses	37.92	9%
Agriculture	34.65	8%
High global-warming potential substances	19.05	4%
Recycling and waste	8.73	2%
Totals	440.36	100%

Source: CARB 2017a.

MMT CO₂e = million metric tons of carbon dioxide equivalent per year

^a Percentage of total has been rounded, and total may not sum due to rounding.

^b The Aliso Canyon natural gas leak event released 1.96 MMT CO₂e of unanticipated emissions in 2015 and 0.52 MMT CO₂e in 2016. These leak emissions will be fully mitigated according to legal settlement and are tracked separately from routine inventory emissions.

^c Includes emissions associated with imported electricity, which account for 33.74 MMT CO₂e annually.

**Table 2.7-2
San Diego County Greenhouse Gas Emissions by Sectors**

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total
On-road transportation	14.4	42%
Electricity generation	8.3	24%
Natural gas end uses	2.9	8%
Off-road equipment and vehicles	1.4	4%
Civil aviation	1.9	5%

**Table 2.7-2
San Diego County Greenhouse Gas Emissions by Sectors**

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total
Industrial processes and products	1.8	5%
Waste	0.6	2%
Water-borne navigation	0.1	<1%
Rail	0.32	<1%
Other fuels	1.58	5%
Agriculture (livestock)	0.05	<1%
Wildfires	0.28	<1%
Development (loss of vegetation)	0.18	<1%
Sequestration from land cover	0.66	2%
Total	34.5	100%

Source: EPIC 2013.

MMT CO₂e = million metric tons of carbon dioxide equivalent per year

**Table 2.7-3
County of San Diego General Plan – Project Consistency Analysis**

Goal*	Consistency Analysis
<i>Conservation and Open Space Element</i>	
COS-4.1 Water Conservation. Require development to reduce the waste of potable water through use of efficient technologies and conservation efforts that minimize the County's dependence on imported water and conserve groundwater resources.	<i>Consistent.</i> The Proposed Project would implement drought-tolerant landscaping and fully comply with the San Diego County Model Water Efficiency Landscape Ordinance. The Project would also install low-flow fixtures in each residence in accordance with CALGreen.
COS-4.2 Drought-Efficient Landscaping. Require efficient irrigation systems and in new development encourage the use of native plant species and non-invasive drought tolerant/low water use plants in landscaping.	<i>Consistent.</i> The Proposed Project would implement drought-tolerant landscaping and use recycled water for landscape irrigation.
COS-4.5 Recycled Water. Promote the use of recycled water and grey water systems where feasible.	<i>Not Applicable.</i> Because of the Proposed Project's proximity to the Otay Reservoir, a drinking water source for the City of San Diego, recycled and grey water systems would not be used for the Proposed Project.
COS-14.1 Land Use Development Form. Require that development be located and designed to reduce vehicular trips (and associated air pollution) by utilizing compact regional and community-level development patterns while maintaining community character.	<i>Consistent.</i> The Proposed Project would encourage non-vehicular modes of transportation through the inclusion of bike lanes and a pedestrian network. These features would help reduce vehicle trips and associated air pollution through community-level development patterns. The Proposed Project would include a mix of land uses, including recreational and commercial uses, and potentially would also include a school site. PDF-TR-1 would reduce vehicle miles traveled (VMT) associated with the Proposed Project through implementation of a Transportation Demand Management (TDM) program.

**Table 2.7-3
County of San Diego General Plan – Project Consistency Analysis**

Goal*	Consistency Analysis
COS-14.2 Villages and Rural Villages. Incorporate a mixture of uses within Villages and Rural Villages that encourage people to walk, bicycle, or use public transit to reduce air pollution and GHG emissions.	<i>Consistent.</i> The Proposed Project would encourage non-vehicular modes of transportation through the inclusion of bike lanes and a pedestrian network. These features would help reduce air pollution and greenhouse gas (GHG) emissions. PDF-TR-1 would reduce VMT associated with the Proposed Project through implementation of a TDM program.
COS-14.3 Require design of residential subdivisions and non-residential development through “green” and sustainable land development practices to conserve energy, water, open space, and natural resources.	<i>Consistent.</i> The Proposed Project’s residences would meet zero net energy (ZNE) design standards. In furtherance of ZNE, solar installations would be provided on all residential units. Additionally, community pools would be heated through solar-water heating systems and would not require natural gas. The Proposed Project would also include the installation of EV charging equipment in the garages of half of all residential units and installation of charging stations in the Village Core. Moreover, the Proposed Project would be consistent with the most recent Title 24 standards, would offer drought-tolerant landscaping, and would offer other design features designed to conserve energy, water, open space, and natural resources.
COS-14.4 Sustainable Technology and Projects. Require technologies and projects that contribute to the conservation of resources in a sustainable manner, that are compatible with community character, and that increase the self-sufficiency of individual communities, residents, and businesses.	<i>Consistent.</i> The Proposed Project’s residences would meet ZNE design standards as defined by the California Energy Commission (CEC). The Proposed Project would also include the installation of EV charging equipment in the garages of half of all residential units, and the installation of charging stations in the Village Core. Additionally, the Proposed Project would meet the most recent Title 24 standards, and would feature drought-tolerant landscaping. These project features would contribute to the conservation of resources; would be compatible with community character; and would increase the self-sufficiency of individual communities, residents, and businesses.
COS-14.7 Alternative Energy Sources for Development Projects. Encourage development projects that use energy recovery, photovoltaic (PV), and wind energy.	<i>Consistent.</i> All Proposed Project residences would meet ZNE design standards, as defined by the CEC, and use rooftop PV in furtherance of this standard. The Proposed Project would also include the installation of EV charging equipment in the garages of half of all residential units. The Proposed Project would also include installation of charging stations in the Village Core.
COS-14.9 Significant Producers of Air Pollutants. Require projects that generate potentially significant levels of air pollutants and/or GHGs such as quarries, landfill operations, or large land development projects to incorporate renewable energy, and the best available control technologies and practices into the project design.	<i>Consistent.</i> Photovoltaic panels would be used on all residences to achieve ZNE design. The Proposed Project would also implement other best available control technologies and practices to minimize air pollutants and/or GHGs. The Proposed Project would also include the installation of EV charging equipment in the garages of half of all residential units and in the Village Core.
COS-14.10 Low Emission Construction Vehicles and Equipment. Require County contractors and encourage other developers to use low emission construction vehicles and equipment to improve air quality and reduce GHG emissions.	<i>Consistent.</i> Site grading was designed to be balanced, which would reduce off-site truck trips during construction of the Proposed Project. Additionally, Tier 4 construction equipment would be employed during construction activities when feasible and commercially available at the regional level.

**Table 2.7-3
County of San Diego General Plan – Project Consistency Analysis**

Goal*	Consistency Analysis
<p>COS-15.1 Design and Construction of New Buildings. Require that new buildings be designed and constructed in accordance with green building programs that incorporate techniques and materials that maximize energy efficiency, incorporate the use of sustainable resources and recycled materials, and reduce emissions of GHGs and toxic air contaminants.</p>	<p><i>Consistent.</i> The Proposed Project would use solar panels on all residential units, and would not include wood-burning fire places. Also, by conforming to the ZNE and CALGreen standards (PDF-AQ/GHG-2), the Proposed Project would require that new buildings be designed and constructed in accordance with "green" building programs that incorporate techniques and materials that maximize energy efficiency, incorporate the use of sustainable resources and recycled materials, and reduce emissions of GHGs and toxic air contaminants.</p> <p>The Proposed Project would also include the installation of EV charging equipment in the garages of half of all residential units.</p>
<p>COS-15.4 Title 24 Energy Standards. Require development to minimize energy impacts from new buildings in accordance with or exceeding Title 24 energy standards.</p>	<p><i>Consistent.</i> The Proposed Project would meet ZNE design standards as defined by the CEC.</p>
<p>COS-16.1 Alternative Transportation Modes. Work with SANDAG and local transportation agencies to expand opportunities for transit use. Support the development of alternative transportation modes, as provided by Mobility Element policies.</p>	<p><i>Consistent.</i> The Proposed Project would encourage alternative modes of transportation through bike lanes and a pedestrian network. These features would help reduce air pollution and GHG emissions. PDF-TR-1 would reduce VMT associated with the Proposed Project through implementation of a TDM program.</p>
<p>COS-16.2 Single-Occupancy Vehicles. Support transportation management programs that reduce the use of single-occupancy vehicles.</p>	<p><i>Consistent.</i> The Proposed Project would encourage alternative modes of transportation through the inclusion of bike lanes and a pedestrian network. PDF-TR-1 would reduce VMT associated with the Proposed Project through implementation of a TDM program.</p>
<p>COS-16.3 Low-Emissions Vehicles and Equipment. Require County operations and encourage private development to provide incentives (such as priority parking) for the use of low- and zero-emission vehicles and equipment to improve air quality and reduce GHG emissions. [Refer also to Policy M- 9.3 (Preferred Parking) in the Mobility Element.]</p>	<p><i>Consistent.</i> The Proposed Project would include the installation of EV charging equipment in the garages of half of all residential units, and the installation of charging stations in the Village Core.</p>
<p>COS-16.5 Transit-Center Development. Encourage compact development patterns along major transit routes.</p>	<p><i>Not Applicable.</i> The Proposed Project would not include development along a major transit route.</p>
<p>COS-17.1 Reduction of Solid Waste Materials. Reduce GHG emissions and future landfill capacity needs through reduction, reuse, or recycling of all types of solid waste that is generated. Divert solid waste from landfills in compliance with state law.</p>	<p><i>Consistent.</i> Assembly Bill 341 requires a diversion of 75% of solid waste by 2020, and the Proposed Project would comply with all requirements of state law.</p>
<p>COS-17.6 Recycling Containers. Require that all new land development projects include space for recycling containers.</p>	<p><i>Consistent.</i> The Proposed Project would include space for recycling containers in mixed-use and public-use areas.</p>

**Table 2.7-3
County of San Diego General Plan – Project Consistency Analysis**

Goal*	Consistency Analysis
COS-19.1 Sustainable Development Practices. Require land development, building design, landscaping, and operational practices that minimize water consumption.	<i>Consistent.</i> The Proposed Project would install drought-tolerant landscaping, and would not allow front lawns/turf. Through these project design features, the Proposed Project would minimize water consumption for landscaping.

* Source: County of San Diego 2011

**Table 2.7-4
Regulatory Compliance Measures that Reduce Greenhouse Gas Emissions**

Regulation Number	Regulatory Compliance Measure	Description	Quantification Details
<i>Energy</i>			
REG-GHG-1	Compliance with Title 24 Building Energy Efficiency Standards	Title 24 of the California Code of Regulations serves to enhance and regulate California's building standards. The most recent amendments to Title 24, Part 6, referred to as the 2016 standards, became effective on January 1, 2017. CalEEMod Version 2016.3.1 assumes compliance with 2013 Title 24 Standards. In general, single-family homes built to the 2016 standards are anticipated to use about 28% less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards, and non-residential buildings built to the 2016 standards will use an estimated 5% less energy than those built to the 2013 standards (CEC 2015a).	Per PDF-AQ/GHG-2, the Proposed Project residential land uses would be zero net energy (ZNE), which exceeds the energy efficiency requirements of the 2016 Title 24 standards. Accordingly, no emissions reduction associated with compliance with 2016 Title 24 building energy efficiency standards was assumed for residential land uses. The CalEEMod default values for Title 24-regulated energy, natural gas, and lighting were assumed to be 5% more efficient, then improved another 10% from the 2016 estimated values to reflect demand after implementation of PDF-AQ/GHG-3.
REG-GHG-2	Solar-Ready Units	Per CEC's 2016 Residential Compliance Manual (CEC 2015c), all single-family homes constructed as part of the Proposed Project would be designed with pre-plumbing for solar water heaters and solar and/or wind renewable energy systems.	No reduction assumed.
REG-GHG-3	Renewables Portfolio Standards (RPS)	Implementation of the 20% RPS mandate by 2010 would reduce greenhouse gas (GHG) emissions in the near-term. Implementation of the 33% target by 2020 would reduce GHG emissions by following full implementation of the RPS. Implementation of the 33% RPS would reduce GHG emissions by 27% below	The emissions intensity factors for utility energy use were adjusted in CalEEMod to account for implementation of the RPS based on Senate Bill 350, CalEEMod 2016.3.1, Appendix D, Table 1.2, and the SDG&E 2009 Power Content Label (actual; SDG&E 2009). The RPS for

**Table 2.7-4
Regulatory Compliance Measures that Reduce Greenhouse Gas Emissions**

Regulation Number	Regulatory Compliance Measure	Description	Quantification Details
		2006 levels. Implementation of the 50% mandate by 2030 would reduce GHG emissions by an additional 17%.	operational year 2028 was 46.6%, interpolated from the 2020 and 2030 goals of 33 and 50% respectively (see Appendix A of Appendix 2.7-1).
<i>Mobile Sources</i>			
REG-GHG-4	Low Carbon Fuel Standard (LCFS)	The LCFS is anticipated to achieve a 10% reduction in emissions from transportation fuels.	Conservatively, no reduction was taken for this regulation. Although the LCFS would reduce emissions from transportation fuels, EMFAC 2014—which forms the platform for CalEEMod Version 2016.3.1's mobile source emissions factors—does not account for it.
REG-GHG-5	State and Federal Mobile Source Reduction Strategies	<ul style="list-style-type: none"> • Advanced Clean Cars (for model years 2016 and beyond) The Advanced Clean Car standards would result in approximately 3% more reductions from passenger vehicles than the Pavley standards by 2020, 12% by 2025, 19.5% by 2030, and 33% by 2050. • Truck and Bus Rule (2014 Amendment) • Heavy-Duty Greenhouse Gas Phase 1 (2013), which includes the 2013 Tractor-Trailer Greenhouse Gas Regulation Amendments and Federal Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles • Pavley I federal standard for model years 2012 through 2016 	Accounted for in EMFAC 2014 vehicle emission factors as part of CalEEMod Version 2016.3.1.
REG-GHG-6	Pre-Wiring for Electric Vehicle Charging Equipment	Per CALGreen, pre-wiring for the installation of EV charging equipment in the garages in all residential units and in the Village Core would be implemented (CALGreen 2016b, 2016c).	Conservatively, no reduction was taken for this regulation.
<i>Solid Waste</i>			
REG-GHG-7	Curbside Recycling	Curbside recycling for residential units, the school, and commercial and retail establishments would be required in accordance with the California Integrated Waste Management Act (Assembly Bill (AB) 939) and AB 341.	Measure would contribute toward 75% diversion rate as required by AB 939 and AB 341. The solid waste generation rate developed for the Proposed Project includes diversion requirements. No additional reductions were assumed.

**Table 2.7-4
Regulatory Compliance Measures that Reduce Greenhouse Gas Emissions**

Regulation Number	Regulatory Compliance Measure	Description	Quantification Details
<i>Water Conservation</i>			
REG-GHG-8	Low-Flow Fixtures	Indoor residential plumbing products would comply with the 2016 CALGreen Code, including future updates to CALGreen as these updates apply to homes in the Proposed Project built under the updated code.	Reductions accounted for in the Water Conservation Plan (Appendix 3.1.2-3). No further reductions were assumed in emissions estimates.
REG-GHG-9	Reduction in Indoor Water Use	The Proposed Project would comply with Executive Order (EO) B-29-15, which calls for a 25% reduction in total water use below 2013 levels. The Otay Water District has adopted a 20% reduction in water use.	Reductions accounted for in the Water Conservation Plan (Appendix 3.1.2-3). No further reductions were assumed in emissions estimates.
REG-GHG-10	Reduction in Outdoor Water Use	<p>The Proposed Project would comply with EO B-29-15, which calls for a 25% reduction in total water use below 2013 levels.</p> <p>To achieve this reduction, the Proposed Project would employ drought-tolerant landscaping and recycled water for irrigation.</p> <p>In addition, through the Proposed Project's plan process, and, in the case of individual homeowners, the Proposed Project's CC&Rs, the Proposed Project would be required to comply with the County of San Diego's Landscape Ordinance and Water Efficient Landscape Design Manual for all outdoor landscapes, including common areas, public spaces, parkways, medians, parking lots, parks, and all builder- and homeowner-installed private frontyard and backyard landscaping.</p>	Reductions associated with EO B-29-15 and the County's Landscape Ordinance and Water Efficient Landscape Design Manual (County of San Diego 2010) were accounted for in the Water Conservation Plan (Appendix 3.1.2-3). No further reductions were assumed in emissions estimates.

Note: PDF = project design feature

**Table 2.7-5
Project Design Features that Reduce Greenhouse Gas Emissions**

PDF Number	Strategy to Reduce GHG Emissions	Description	Quantification Details
<i>Energy Efficiency Measures</i>			
PDF-AQ/GHG-1	Wood-Burning Stoves and Fireplaces	Prior to the issuance of residential building permits, the Proposed Project applicant or its designee shall submit building plans illustrating that no wood-burning stoves or fireplaces would be constructed.	The number of wood-burning stoves and fireplaces were set to zero in CalEEMod. Natural gas fireplace use was included in the natural gas consumption estimates in the energy module of CalEEMod.
PDF-AQ/GHG-2 ^a	Zero Net Energy Residences	Prior to the issuance of residential building permits, the Proposed Project applicant or its designee shall submit building plans illustrating compliance with the zero net energy (ZNE) design standards defined by the California Energy Commission.	Proposed Project electricity and natural gas assumptions were incorporated into CalEEMod for the residential land uses based on the Jackson Pendo Development Company Building Analysis (ConSol 2017).
PDF-AQ/GHG-3	Non-Residential Energy Improvement Standards	Prior to the issuance of non-residential building permits, the Proposed Project applicant or its designee shall submit building plans illustrating that the Proposed Project's non-residential land uses shall achieve a 10% greater building energy efficiency than required by the 2016 State energy efficiency standards in Title 24, Part 6 of the California Code of Regulations.	CalEEMod default energy rates reflect 2013 standards. Accordingly, Title 24 energy use was adjusted to reflect the estimated 5% increase in efficiency for non-residential buildings (CEC 2015a), and then adjusted to reflect an additional 10% increase on the calculated 2016 energy demand factors.
PDF-AQ/GHG-4	Energy Star Appliances	All appliances (washer/dryers, refrigerators, and dishwashers) that will be installed by builders in residences and commercial businesses shall be Energy Star rated or equivalent.	The following percent improvement in energy efficiency was assumed in CalEEMod based on default values: Clothes washers: 30% Dishwashers: 15% Fan: 50% Refrigerator: 15%
PDF-AQ/GHG-5	Solar Water Heating	Prior to the issuance of private recreation center building permits, the Proposed Project applicant or its designee shall submit swimming pool heating design plans to the County of San Diego for review and approval. The design plans shall demonstrate that swimming pools located at private recreation centers in the Project Area are designed and shall be constructed to use solar water heating or other technology with an equivalent level of energy efficiency.	Emission reduction was calculated based on Metering and Measuring of Multi-Family Pool Pumps, Final Report (SCE 2016) and Gas Swimming Pool Heaters (DOE 2017).

**Table 2.7-5
Project Design Features that Reduce Greenhouse Gas Emissions**

PDF Number	Strategy to Reduce GHG Emissions	Description	Quantification Details
<i>Mobile Emissions Reductions</i>			
PDF-AQ/GHG-6	Electric Vehicle Charging Stations	Prior to the issuance of residential building permits, the Proposed Project applicant or its designee shall submit plans for the installation of one Level 2 EV charging station in the garage in half of all residential units and 10 EV charging stations within the Village Core and park areas to the County of San Diego for review and approval. Prior to the issuance of non-residential building permits in the Proposed Project's Village Core area, the applicant or its designee shall submit plans for the installation of Level 2 EV charging stations in 10 parking spaces located in the Village Core's commercial development area and P1 through P4 park area parking spaces to the County of San Diego for review and approval.	Conservatively, no credit was taken for implementation for EV chargers.
PDF-TR-1	Bus Pull-Ins	Bus pull-ins will be constructed throughout the Project Area.	Conservatively, no credit was taken for implementation of bus pull-ins.
	Improve Design of Development	The Proposed Project will include improved design elements to enhance walkability and connectivity. Improved street network characteristics within a neighborhood include street accessibility, usually measured in terms of average block size, proportion of four-way intersections, or number of intersections per square mile. Design is also measured in terms of sidewalk coverage, building setbacks, street widths, pedestrian crossings, presence of street trees, and a host of other physical variables that differentiate pedestrian-oriented environments from auto-oriented environments.	Conservatively, no credit was taken for implementation of improvement of design..
	Locate Project Near Bike Path/Bike Lane	The Proposed Project will be located within 1/2 mile of an existing Class I path or Class II bike lane. The Proposed Project design should include a comparable network that connects the Proposed Project uses to the existing off-site facilities.	A 0.63% reduction in VMT for Village 14 was assumed based on the Proposed Project's TDM Program Evaluation (Appendix 2.9-1).
	Provide Pedestrian Network Improvements	The Proposed Project will provide a pedestrian access network that internally links all uses and connects to all existing or planned external streets and pedestrian facilities contiguous with the Project Area. The Proposed Project will minimize barriers to pedestrian access and interconnectivity. Physical barriers such as walls, landscaping, and slopes that impede pedestrian circulation will be eliminated.	A 2% reduction in VMT from Village 14 was assumed based on the Proposed Project's TDM Program Evaluation (Appendix 2.9-1).
	Provide Traffic Calming Measures	Proposed Project design will include pedestrian/bicycle safety and traffic-calming measures in excess of jurisdiction requirements. Roadways will be designed to reduce motor vehicle speeds and encourage pedestrian and bicycle trips with traffic-calming features. Traffic-calming features may include marked crosswalks, count-down signal timers, curb extensions, speed tables, raised crosswalks, raised	A 0.63% reduction in VMT from Village 14 and Planning Areas 16/19 was assumed based on the Proposed Project's TDM Program Evaluation (Appendix 2.9-1).

**Table 2.7-5
Project Design Features that Reduce Greenhouse Gas Emissions**

PDF Number	Strategy to Reduce GHG Emissions	Description	Quantification Details
		intersections, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, and others.	
	Dedicate Land for Bike Trails	Larger projects may be required to provide for, contribute to, or dedicate land for the provision of off-site bicycle trails linking the Proposed Project to designated bicycle commuting routes in accordance with an adopted citywide or countywide bikeway plan.	A 0.10% reduction in VMT from Village 14 was assumed based on the Proposed Project's TDM Program Evaluation (Appendix 2.9-1).
	Provide Ride-Sharing Programs	The Proposed Project will include a ride-sharing program and a permanent transportation management association membership and funding requirement. Funding may be provided by community, district, or County service area, or other non-revocable funding mechanism. The Proposed Project will promote ride-sharing programs through a multi-faceted approach, including the following: <ul style="list-style-type: none"> • Designating a certain percentage of parking spaces for ride-sharing vehicles • Designating adequate passenger loading and unloading and waiting areas for ride-sharing vehicles • Providing a website or message board for coordinating rides 	A 0.75% reduction in VMT from Village 14 and Planning Areas 16/19 was assumed based on the Proposed Project's TDM Program Evaluation (Chen Ryan 2017ab).
	Implement Commute Trip Reduction Marketing	The Proposed Project will implement marketing strategies to reduce commute trips. Information sharing and marketing are important components to successful commute trip reduction strategies. Implementing commute trip reduction strategies without a complementary marketing strategy will result in lower VMT reductions. Marketing strategies may include the following: <ul style="list-style-type: none"> • New employee orientation of trip reduction and alternative mode options • Event promotions • Publications 	A 0.40% reduction in VMT from Village 14 and Planning Areas 16/19 was assumed based on the Proposed Project's TDM Program Evaluation (Appendix 2.9-1).
	Implement a School Pool Program	The Proposed Project will create a ride-sharing program for school children. Most school districts provide busing services to public schools only. School Pool helps match parents to transport students to private schools, or to schools where students cannot walk or bike but do not meet the requirements for busing.	A 0.24% reduction in VMT from Village 14 and Planning Areas 16/19 was assumed based on the Proposed Project's TDM Program Evaluation (Appendix 2.9-1).
	Required Project Contributions to Transportation Infrastructure Improvement Projects	The Proposed Project should contribute to traffic-flow improvements or other multi-modal infrastructure projects that reduce emissions and are not considered substantially growth inducing. The local transportation agency should be consulted for specific needs.	Conservatively, no credit was taken for Proposed Project contributions to transportation infrastructure improvements.

**Table 2.7-5
Project Design Features that Reduce Greenhouse Gas Emissions**

PDF Number	Strategy to Reduce GHG Emissions	Description	Quantification Details
<i>Water Reduction Measures</i>			
PDF-UT-1	Hot Water Pipe Insulation – Residential and Non-Residential	All hot water pipes shall be insulated and hot and cold water piping shall be separated.	Estimated annual water savings of 2,400 gallons per unit. Reduction included in water use estimates. No additional reduction assumed.
PDF-UT-2	Pressure Reducing Valves – Residential and Non-Residential	The maximum service pressure shall be set to 60 pounds per square inch to reduce potential leakage and prevent excessive flow of water from appliances and fixtures.	Estimated annual water savings of 1,800 gallons per unit. Reduction included in water use estimates. No additional reduction assumed.
PDF-UT-3	Water Efficient Dishwashers	Water efficient dishwashers that carry the Energy Star label shall be installed in all residential units and commercial uses where appropriate.	Estimated annual water savings of 650 gallons per unit. Reduction included in water use estimates. No additional reduction assumed.
PDF-UT-4	Residential Landscaping	All Proposed Project landscaping shall comply with the Model Water Efficient Landscape Ordinance, California Code of Regulations Title 23, Division 2, Chapter 2.7 (Section 490 et seq.).	Estimated that outdoor water use at single-family residences will be reduced by approximately 10%. Reduction included in water use estimates. No additional reduction assumed.

PDF = project design feature

^a Regarding PDF-AQ/GHG-2, Zero Net Energy Development – Residential Land Uses, key policy timelines for ZNE include that all new residential construction will meet ZNE standards starting in 2020, and all new commercial will meet ZNE standards starting in 2030. The Proposed Project incorporates ZNE for residential development only as it is a foreseeable addition to the California Title 24 Building Code Standards. Furthermore, the majority of the Proposed Project is residential development, and the Proposed Project as a whole would produce more electricity than the entire development demands.

**Table 2.7-6
Estimated Annual Construction Greenhouse Gas Emissions**

Year	CO ₂	CH ₄	N ₂ O	CO ₂ e
	<i>Metric Tons per Year</i>			
2019	784.49	0.17	0.00	797.55
2020	1,342.98	0.37	0.00	1,352.22
2021	2,339.79	0.39	0.00	2,349.56
2022	1,813.98	0.37	0.00	1,823.22
2023	2,088.40	0.34	0.00	2,097.23
2024	1,234.14	0.31	0.00	1,241.83
2025	1,023.88	0.24	0.00	1,029.85
2026	586.25	0.13	0.00	589.45

**Table 2.7-6
Estimated Annual Construction Greenhouse Gas Emissions**

Year	CO ₂	CH ₄	N ₂ O	CO ₂ e
	<i>Metric Tons per Year</i>			
2027	181.24	0.04	0.00	182.32
Total	11,395.13	2.36	0.00	11,463.22

CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrous oxide; CO₂e = carbon dioxide equivalent

**Table 2.7-7
Vegetation Removal – Estimated Loss of Sequestered Carbon**

Vegetation Type	CalEEMod Vegetation Land Use Category	CO ₂ Emissions Factor (MT CO ₂ /acre)	Initial (acres)	Final (acres)	Net Loss (acres)	Loss of Sequestered Carbon (MT CO ₂)
Forest Land	Scrub	14.3	1,216.50	516.60	699.90	10,009
Forest Land	Trees	111	3.40	0.20	0.20	22
Grassland	Grassland	4.31	111.50	30.00	81.50	351
Total			1,370.80	557.65	810.15	10,382

Source: CAPCOA 2016; see Appendix 2.7-1 for complete results.
MT CO₂ = metric tons carbon dioxide.

**Table 2.7-8
Estimated Total Construction and Vegetation Removal Greenhouse Gas Emissions**

Emission Source	CO ₂ e (Metric Tons per Year)
Construction Emissions	11,463.22
Vegetation Removal	10,382
Total Emissions	21,845.22
Emissions Amortized Over 30 Years	728.17

CO₂e = carbon dioxide equivalent.

**Table 2.7-9
Estimated Annual Operational Greenhouse Gas Emissions (2028)**

Emission Source	CO ₂ e (Metric Tons per Year)
Area	13.91
Energy	1,136.97
Mobile	13,484.49
Solid Waste	660.81
Water and Wastewater	1,051.97
Total Emissions	16,384

CO₂e = carbon dioxide equivalent.

Implementation of PDF-AQ/GHG-2 would result in an annual energy savings of 1,760 MT CO₂e annually.

Numbers may not add exactly due to rounding.

See Appendix 2.7-1 for complete results.

Table 2.7-10
Planted Trees – Estimated Gain of Sequestered Carbon

Project Tree Category/Species	Tree Category	Growing Period (year)	Number of Trees (trees)	Tree CO ₂ Sequestered Factor (MT CO ₂ /Tree/Year)	Gain of Sequestered CO ₂ (MT CO ₂)
Unknown	Miscellaneous	20	8,000	0.0354	5,664.00
Total					5,664.00

Source: CAPCOA 2016; see Appendix 2.7-1 for complete results.
 MT CO₂ = metric tons carbon dioxide

Table 2.7-11
Estimated Operational Annual Net Greenhouse Gas Emissions (2028)

Emission Source	CO ₂ e (Metric Tons per Year)
Annual Operational Emissions	16,384
Amortized Sequestered Carbon	(189)
Total Net Annual Emissions	16,195

CO₂e = carbon dioxide equivalent.
 See Appendix 2.7-1 for complete results.

Table 2.7-12
San Diego Forward: The Regional Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
<i>The Regional Plan – Policy Objectives</i>		
Mobility Choices	Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people live, work, and play.	<i>Consistent.</i> The Proposed Project's internal circulation features would provide residents the opportunity to access recreational and commercial uses via multiple modes of transportation. Proposed Project travel demand measures would provide ride-sharing services and contribute to off-site improvements to reduce single-occupancy-vehicle trips.
Mobility Choices	Take advantage of new technologies to make the transportation system more efficient and environmentally friendly.	<i>Consistent.</i> The Proposed Project would include lane and intersection design configuration modifications where necessary, and installation of signalization where required per the Transportation Impact Analysis (Appendix 2.9-1). Additionally, the Proposed Project would not impair the San Diego Association of Government's (SANDAG) ability to employ new technologies to make travel more reliable and convenient.

**Table 2.7-12
San Diego Forward: The Regional Plan Consistency Analysis**

Category	Policy Objective or Strategy	Consistency Analysis
Habitat and Open Space Preservation	Focus growth in areas that are already urbanized, allowing the region to set aside and restore more open space in our less developed areas.	<i>Consistent.</i> The Proposed Project would be located near major urban and employment centers, including the City of Chula Vista. The Proposed Project would conserve 426.7 acres as Multiple Species Conservation Program (MSCP) Preserve, and designate 127.1 acres as Limited Development Area.
Habitat and Open Space Preservation	Protect and restore our region's urban canyons, coastlines, beaches, and water resources.	<i>Consistent.</i> The Proposed Project would conserve 426.7 acres as Otay Ranch RMP/MSCP Preserve and designate 127.1 acres as Limited Development Area.
Regional Economic Prosperity	Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages.	<i>Not Applicable.</i> The Proposed Project would not impair the ability of SANDAG to invest in transportation projects available to members of the community.
Regional Economic Prosperity	Build infrastructure that makes the movement of freight in our community more efficient and environmentally friendly.	<i>Not Applicable.</i> The Proposed Project does not involve regional freight movement, nor would it impair SANDAG's ability to preserve and expand options for regional freight movement.
Partnerships/Collaboration	Collaborate with Native American tribes, Mexico, military bases, neighboring counties, infrastructure providers, the private sector, and local communities to design a transportation system that connects to the mega-region and national network, and works for everyone and fosters a high quality of life for all.	<i>Not Applicable.</i> The Proposed Project would not impair the ability of SANDAG to provide transportation choices to better connect the San Diego region with Mexico, neighboring counties, or tribal nations. Furthermore, the Proposed Project has coordinated with Native American tribes and neighboring jurisdictions.
Partnerships/Collaboration	As we plan for our region, recognize the vital economic, environmental, cultural, and community linkages between the San Diego region and Baja California.	<i>Not Applicable.</i> The Proposed Project would not impair the ability of SANDAG to provide transportation choices to better connect the San Diego region with Mexico.
Healthy and Complete Communities	Create great places for everyone to live, work, and play.	<i>Consistent.</i> The Proposed Project's internal circulation features would provide residents the opportunity to access recreational and commercial uses via multiple modes of transportation. The Proposed Project would encourage non-vehicular modes of transportation through the inclusion of an extensive walking and bicycling network.
Healthy and Complete Communities	Connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.	<i>Consistent.</i> The Proposed Project would encourage non-vehicular modes of transportation through the inclusion of bike lanes and an extensive walking and bicycling network. These will connect the Proposed Project with on-site and off-site amenities.

Table 2.7-12
San Diego Forward: The Regional Plan Consistency Analysis

Category	Policy Objective or Strategy	Consistency Analysis
Environmental Stewardship	Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living.	<i>Consistent.</i> The Proposed Project would encourage non-vehicular modes of transportation through the inclusion of bike lanes and an extensive walking and bicycling network.
Environmental Stewardship	Support energy programs that promote sustainability.	<i>Consistent.</i> The Proposed Project would include on-site renewable energy production through solar photovoltaic rooftop systems for all residential units.
<i>Sustainable Communities Strategy (SCS) – Strategies</i>		
Strategy #1	Focus housing and job growth in urbanized areas where there is existing and planned transportation infrastructure, including transit.	<i>Consistent.</i> The Proposed Project would be located near major urban and employment centers, including the City of Chula Vista. The Project Area is not located next to existing or planned transit stop. Proposed Project travel demand measures will provide ride-sharing services and contribute to off-site improvements to reduce single occupancy vehicle trips.
Strategy #2	Protect the environment and help ensure the success of smart growth land use policies by preserving sensitive habitat, open space, cultural resources, and farmland.	<i>Consistent.</i> The Proposed Project's design would conserve 426.7 acres as Otay Ranch RMP/MSCP Preserve and 127.1 acres of Limited Development Area. Development would be concentrated and include parks, commercial areas, and a public safety site.
Strategy #3	Invest in a transportation network that gives people transportation choices and reduces GHG emissions.	<i>Consistent.</i> The Proposed Project would encourage non-vehicular modes of transportation through the inclusion of bike lanes and an extensive walking and bicycling network.
Strategy #4	Address the housing needs of all economic segments of the population.	<i>Consistent.</i> A variety of housing types would be developed, including a range of single-family and higher-density courtyard homes.
Strategy #5	Implement the Regional Plan through incentives and collaboration.	<i>Not Applicable.</i> The Proposed Project would not impair the ability of SANDAG to implement the Regional Transportation Plan through incentives and collaborations.

Source: SANDAG 2015

Table 2.7-13
Estimated Net GHG Emissions With Mitigation Measures (2028)

Emission Source	CO _{2e} Metric Tons per Year
Construction Emissions (one time)	21,845
<i>Reductions from M-GHG-1</i>	<i>(21,845)</i>
Annual Operational Emissions	16,159
Project Life Operational Emissions (30 years)	484,775
<i>Reductions from M-GHG-2</i>	<i>(484,775)</i>
Net Emissions After Mitigation	0

Notes:

CO_{2e} = carbon dioxide equivalent.

Numbers in parentheses represent negative numbers.

Construction emissions include land conversion. Operational emissions include gain of carbon sequestration. M-GHG-3 is not quantified. M-GHG-4 is included in annual operational emissions.

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