

2.6 Greenhouse Gas Emissions

This section evaluates the environmental significance of the Warner Ranch Project's (project's) greenhouse gas (GHG) emissions by analyzing the increase in GHG emissions that would result, directly or indirectly, from project implementation; describing the project features that would reduce GHG emissions; and examining the significance of the project's GHG emissions relative to several relevant benchmarks. Information in this section is based on the *Global Climate Change Analysis for the Warner Ranch Residential Development Project* prepared by LDN Consulting Inc., which is included as Appendix O.

2.6.1 Existing Conditions

Global climate change refers to any substantial change in measures of climate (such as temperature, precipitation, or wind) lasting for decades or longer. Global warming is an average increase in the temperature of the atmosphere, which can contribute to changes in global climate patterns. Gases that trap heat in the atmosphere are often called GHGs. Some GHGs, such as water vapor, occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted through human activities.

The greenhouse effect traps heat in the troposphere through a three-fold 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 this long-wave radiation into space and toward the Earth. This "trapping" of the long-wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The greenhouse effect is a natural process that contributes to regulating the Earth's temperature. Without it, the temperature of the Earth would be about 0° Fahrenheit (°F) or -18° Celsius (°C) instead of its present 57°F (14°C) (NCDC 2011). However, it is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of GHGs in the atmosphere beyond the level of naturally occurring concentrations.

According to the U.S. Environmental Protection Agency (EPA), the Earth's climate has changed many times during the planet's history, with events ranging from ice ages to long periods of warmth. Historically, natural factors such as volcanic eruptions, changes in the Earth's orbit, and the amount of energy released from the sun have affected the Earth's climate. Beginning late in the eighteenth century, human activities associated with the Industrial Revolution have also changed the composition of the atmosphere and, therefore, very likely are influencing the Earth's climate. Over the past 200 years, the burning of fossil fuels, such as coal and oil, and deforestation has caused the concentrations of heat-trapping GHGs to increase substantially in the atmosphere.

2.6.1.1 *The Greenhouse Effect and Greenhouse Gases*

GHGs are gases that trap heat in the atmosphere, analogous to the way a greenhouse retains heat. Common GHGs include water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxides (N₂O), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), ozone (O₃), and aerosols. Global atmospheric concentrations of CO₂, CH₄, and N₂O have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years.

Individual GHGs have varying potential to contribute to global warming and atmospheric lifetimes. The effect each GHG has on climate change is measured as a combination of the mass of its emissions and the potential of a gas or aerosol to trap heat in the atmosphere, known as its global warming potential (GWP). Table 2.6-1, Global Warming Potentials and Atmospheric Lifetimes of Basic GHGs, identifies the GWP and atmospheric lifetimes of basic GHGs. The CO₂ equivalent (CO₂E) is a unit used for comparing GHG emissions since it normalizes various GHG emissions to a consistent measure. The reference gas for GWP is CO₂; therefore, CO₂ has a GWP of one. By comparison, the GWP of CH₄ is 21. This means that CH₄ has a greater global warming effect than CO₂ on a molecule per molecule basis. The mass emissions of CO₂ equivalent is the mass emissions of an individual GHG multiplied by its GWP.

The California Health and Safety Code and California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.) define GHGs to include the following compounds: CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, and nitrogen trifluoride (NF₃). Descriptions of these compounds and their sources are provided below.

Carbon Dioxide (CO₂)

CO₂ enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions, such as through the manufacturing of cement. The largest source of CO₂ emissions globally is the combustion of fossil fuels such as coal, oil and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO₂ emissions.

Carbon dioxide is also removed from the atmosphere (or “sequestered”) when it is absorbed by plants as part of the biological carbon cycle. Natural sources of CO₂ occur within the carbon cycle where billions of tons of atmospheric CO₂ are removed from the atmosphere by oceans and growing plants, also known as “sinks,” and are emitted back into the atmosphere annually

through natural processes also known as “sources.” When in balance, the total CO₂ emissions and removals from the entire carbon cycle are roughly equal (EPA 2008).

The Global Carbon Project released an update of the global carbon budget in 2013. The atmospheric CO₂ concentration in 2012 was 392 parts per million (ppm), 42 percent above the concentration at the start of the Industrial Revolution (about 278 ppm in 1750). The 2012 concentration was the highest known concentration during at least the last 800,000 years. Results show that CO₂ emissions from fossil fuels burning and cement production increased by 2 percent in 2012, with a total of 9.7 billion tons of CO₂ emitted to the atmosphere. CO₂ emissions from fossil fuels burning and cement production were projected to increase by 2.1 percent in 2012, 58 percent above 1990 emissions (Global Carbon Project 2013).

Methane (CH₄)

CH₄ is emitted from a variety of both human-related and natural sources. Human-related activities include fossil fuel production, animal husbandry, rice cultivation, biomass burning, and waste management. CH₄ is emitted during the production and transport of coal, natural gas, and oil. CH₄ emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills. It is estimated that 60 percent of global CH₄ emissions result from human-related activities. Natural sources of CH₄ include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires.

CH₄ emission levels from a source can vary significantly from one country or region to another depending on many factors such as climate, industrial and agricultural production characteristics, energy types and usage, and waste management practices. For example, temperature and moisture have a significant effect on the anaerobic digestion process, which is one of the key biological processes that cause CH₄ emissions in both human-related and natural sources. Also, the implementation of technologies to capture and utilize CH₄ from sources such as landfills, coal mines, and manure management systems affects the emission levels from these sources (EPA 2008).

Nitrous Oxide (N₂O)

N₂O is produced by both natural and human-related sources. N₂O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Primary human-related sources of N₂O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic (fatty) acid production, and nitric acid production. N₂O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests.

N₂O emission levels from a source can vary significantly from one country or region to another, depending on many factors such as industrial and agricultural production characteristics, combustion technologies, waste management practices, and climate. For example, heavy utilization of synthetic nitrogen fertilizers in crop production typically results in significantly more N₂O emissions from agricultural soils than that occurring from less intensive, low-tillage techniques. Also, the presence or absence of control devices on combustion sources, such as catalytic converters on automobiles, can have a significant effect on the level of N₂O emissions from these types of sources (EPA 2008).

Fluorinated Gases

HFCs, PFCs, SF₆, and NF₃ are synthetic, powerful GHGs that are emitted from a variety of industrial processes, including aluminum production, semiconductor manufacturing, electric power transmission, magnesium production and processing, and the production of chlorodifluoromethane (HCFC-22), commonly used in air conditioning applications. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances, such as CFCs, hydrochlorofluorocarbons (HCFCs), and halons. These gases are typically emitted in smaller quantities, but have higher GWP than other GHGs (EPA 2008).

There are several gases that do not have a direct global warming effect but indirectly affect terrestrial and/or solar radiation absorption by influencing the formation or destruction of GHGs, including tropospheric and stratospheric ozone. These gases include carbon monoxide, oxides of nitrogen, and non-methane volatile organic compounds (VOCs). Aerosols, which are extremely small particles or liquid droplets, such as those produced by sulfur dioxide or elemental carbon emissions, can also affect the absorptive characteristics of the atmosphere.

2.6.1.2 Greenhouse Gas Emissions Inventories

Global

Anthropogenic GHG emissions worldwide in 2011 totaled approximately 43,816 million metric tons of CO₂E (MMT CO₂E). Six countries—China, the United States, the Russian Federation, India, Japan, and Brazil—and the European Community accounted for approximately 66 percent of the total global emissions, approximately 28,943 MMT CO₂E (CAIT 2014).

National

In 2012, the United States produced 6,526 MMT CO₂E (EPA 2014). This 2012 total represents a 5 percent increase since 1990 levels, but a 10 percent decrease since 2005 GHG emissions. Electricity generation was the largest source of these emissions accounting for 32 percent, while transportation related emissions accounted for 27 percent of total emissions. When considering

emissions, sinks or areas where GHG emissions are offset or absorbed must also be factored. In 2012, 15 percent of U.S. GHG emissions were offset from land use and forestry. Net growth of forests is the largest carbon sink, with land use efficiency and appropriate use of landfills.

GHG emissions in the United States mirrored population growth from 1990 to 2007, which caused emissions per capita to remain relatively level. Total emissions per capita have decreased due to the drop in United States production associated with the economic recession, and the growing use of natural gas to generate electricity rather than carbon intensive fuels (EPA 2014).

State

According to the GHG inventory data compiled by the California Air Resources Board (CARB) for the California Greenhouse Gas Inventory for 2000–2012, California emitted 458.7 MMT CO₂E of GHGs, including emissions resulting from out-of-state electrical generation (CARB 2014a). The primary contributors to GHG emissions in California are transportation, electric power, industrial use, agriculture, waste storage, and other sources, which include commercial and residential activities. These primary contributors to California's GHG emissions and their relative contributions in 2012 are presented in Table 2.6-2, California GHG Emissions by Sectors.

Local

According to the GHG inventory data compiled by the Energy Policy Initiative Center for 1990 through 2035 projected values, in 2010 San Diego County (County) emitted 34.5 MMT CO₂E of GHGs (EPIC 2013). As outlined in Table 2.6-3, San Diego County GHG Emissions by Sectors, on-road transportation created 42 percent of these emissions. Similar to emissions trends statewide, electricity generation is the second biggest emitter.

2.6.2 Regulatory Setting

Federal

United States Environmental Protection Agency

The EPA is the federal agency responsible for setting and enforcing the national ambient air quality standards (NAAQS) for atmospheric pollutants. The EPA also regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The EPA also has jurisdiction over emission sources outside state waters (outer continental shelf), and establishes various emissions standards for vehicles sold in states other than California.

Massachusetts v. EPA

On April 2, 2007, in *Massachusetts v. EPA*, 549 U.S. 497, the U.S. Supreme Court found that GHGs are air pollutants covered by the Clean Air Act (CAA). The court held that the Administrator of the EPA must 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 making these decisions, the Administrator was reminded by the court to follow the language of Section 202(a) of the CAA.

In response to the Supreme Court's ruling, on December 7, 2009, the EPA Administrator signed a final rule with two distinct findings regarding GHGs under Section 202(a) of the CAA:

- 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 referred to as the endangerment finding.
- 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 referred to as 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 CAA.

Energy Independence and Security Act of 2007

On December 19, 2007, President Bush signed the Energy Independence and Security Act of 2007. Among other key measures, the act accomplishes the following, which would aid in the reduction of national GHG emissions:

- Increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Sets a target of 35 miles per gallon (mpg) for the combined fleet of cars and light trucks by model year 2020, and directs 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.
- Prescribes or revises standards affecting regional efficiency for heating and cooling products, and establishes procedures for new or amended standards for energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

EPA and NHTSA Joint Rules for Vehicle Standards

On April 1, 2010, the EPA and the Department of Transportation's NHTSA announced a joint final rule to establish a national program consisting of new standards for light-duty vehicles model years 2012 through 2016. The joint rule is intended to reduce GHG emissions and improve fuel economy. The EPA approved the first-ever national GHG emissions standards under the Clean Air Act, and NHTSA approved Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act. The final rule became effective on July 6, 2010.

The EPA's GHG standards require new passenger cars, light-duty trucks, and medium-duty passenger vehicles to meet an estimated combined average emissions level of 250 grams of CO₂ per mile in model year 2016, equivalent to 35.5 mpg if the automotive industry were to meet this CO₂ level through fuel economy improvements alone. The CAFE standards for passenger cars and light trucks will be phased in between 2012 and 2016, with the final standards equivalent to 37.8 mpg for passenger cars and 28.8 mpg for light trucks, resulting in an estimated combined average of 34.1 mpg. Together, these standards will cut GHG emissions by an estimated 960 MMT and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program.

In 2011, the EPA and NHTSA approved the first-ever program to reduce GHG emissions and increase fuel efficiency for medium- and heavy-duty vehicles. Effective November 14, 2011, the CO₂ emissions and fuel efficiency standards of this regulation apply to model year 2014 to 2018 combination tractors (i.e., semi-trucks), heavy-duty pickup trucks and vans, and vocational vehicles including transit and school buses. This regulation covers vehicles with a gross vehicle weight rating of 8,500 pounds or greater; medium-duty passenger vehicles are covered by the previous regulation for passenger cars and light-duty trucks. In addition, the EPA has adopted standards to control HFC leakage from air conditioning systems in combination tractors and heavy-duty pickup trucks and vans as well as CH₄ and N₂O standards for heavy-duty engines, pickup trucks, and vans. Phased in through model year 2017, the CO₂ and fuel consumption standards for combination trailers depend on the weight class, cab type, and roof length. The CO₂ standards are expressed in grams CO₂ per ton-mile, while the fuel consumption standards are expressed in gallons per 1,000 ton-miles, each accounting for the carrying capacity of the tractor and trailer. These standards represent an overall fuel consumption and CO₂ emissions reduction of up to 23 percent when compared to a baseline 2010 model year. The CO₂ and fuel consumption standards for heavy-duty pickup trucks and vans are applied as corporate average values and are phased in with increasing stringency from model year 2014 to 2018. The final EPA standards for heavy-duty pickup trucks and vans for 2018 (including a separate standard to control air conditioning system leakage) represent a GHG reduction of 17 percent for diesel vehicles and 12 percent for gasoline vehicles compared to a 2010 baseline. Due to the variety of vocational vehicles, many of which involve a body installed on a chassis, the CO₂ and fuel consumption standards are applied to the chassis

manufacturers. Like the CO₂ and fuel consumption standards for combination tractors, the standards for vocational vehicles are expressed in grams CO₂ per ton-mile and gallons per 1,000 ton-miles, respectively. Upon final implementation, the EPA standards for vocational vehicles, which apply initially to model year 2014 to 2016 and then to model year 2017 vehicles, are expected to reduce GHG emissions by 6 to 9 percent compared to a 2010 baseline.

In August 2012, the EPA and NHTSA approved a second round of GHG and CAFE standards for model years 2017 and beyond. These standards will reduce motor vehicle GHG emissions to 163 grams of CO₂ per mile, which is equivalent to 54.5 mpg if this level were achieved solely through improvements in fuel efficiency, for cars and light-duty trucks by model year 2025. A portion of these improvements, however, will likely be made through improvements in air conditioning leakage and through use of alternative refrigerants, which would not contribute to fuel economy. The first phase of the CAFE standards, for model year 2017 to 2021, is projected to require, on an average industry fleet-wide basis, a range from 40.3 to 41.0 mpg in model year 2021. The second phase of the CAFE program, for model years 2022 to 2025, is projected to require, on an average industry fleet-wide basis, a range from 48.7 to 49.7 mpg in model year 2025. The second phase of standards have not been finalized due to the statutory requirement that NHTSA set average fuel economy standards not more than five model years at a time. The regulations also include targeted incentives to encourage early adoption and introduction into the marketplace of advanced technologies to dramatically improve vehicle performance, including:

- Incentives for electric vehicles, plug-in hybrid electric vehicles, and fuel cells vehicles;
- Incentives for hybrid technologies for large pickups and for other technologies that achieve high fuel economy levels on large pickups;
- Incentives for natural gas vehicles; and,
- Credits for technologies with potential to achieve real-world GHG reductions and fuel economy improvements that are not captured by the standards test procedures.

State

Executive Order S-3-05

In June 2005, Governor Arnold Schwarzenegger established California's GHG emissions reduction targets in Executive Order (EO) S-3-05. The EO established the following goals:

1. GHG emissions should be reduced to 2000 levels by 2010.
2. GHG emissions should be reduced to 1990 levels by 2020 (as codified in AB 32).
3. GHG emissions should be reduced to 80 percent below 1990 levels by 2050.

This order also directed the Secretary of the California Environmental Protection Agency to coordinate the efforts of various agencies to collectively and efficiently reduce GHGs. As a result, representatives from several state agencies were convened to establish the Climate Action Team. Since its establishment, the Climate Action Team has issued a number of reports to the governor and the legislature that are intended to help the State of California identify programs to reduce GHG emissions and prepare for the effects of climate change through adaptation (CAT 2006, 2010, 2013).

Executive Order B-30-15

On April 29, 2015, Governor Jerry Brown issued an EO that established an interim GHG reduction target in support of targets previously established under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing GHG emissions to 40 percent below 1990 levels by 2030. The interim target was established to ensure California would effectively continue its trajectory toward meeting or exceeding the long-term emission reduction target goal of reducing GHG emissions to 80 percent below 1990 levels by 2050 as set forth in S-3-05. B-30-15 calls for an update to CARB's Scoping Plan which provides information on how the state will reduce GHG emissions in various sectors and industries, and calls for state agencies to continue to develop and implement GHG emission reduction programs in support of these target goals. Additionally, sector-specific agencies in transportation, energy, water and forestry will be required to prepare GHG reduction plans by September 2015, followed by a report on actions taken in relation to these plans in June 2016. As discussed below, SB 32, which codified into law the 2030 horizon-year goal, was signed into law by Governor Brown on September 8, 2016. However, the Legislature did not adopt the 2050 horizon-year goal from EO S-3-05.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

In furtherance of the goals established in EO S-3-05, the legislature enacted Assembly Bill (AB) 32 (Núñez and Pavley), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed into law on September 27, 2006. The GHG emissions limit established by AB 32 is equivalent to California's 1990 emission levels, which are to be achieved by 2020. And, as required under AB 32, on December 6, 2007, CARB approved the 1990 GHG emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 MMT CO₂E.

CARB is responsible for developing the programs and requirements necessary to achieve the goals of AB 32, and must coordinate with other state agencies when necessary to achieve the necessary emission reductions. Therefore, pursuant to AB 32, CARB adopted regulations requiring the reporting and verification of statewide GHG emissions. This program is used to monitor and enforce compliance with the established standards. CARB also has adopted, and continues to

develop, rules and regulations intended to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 also authorized CARB to adopt a market-based compliance mechanism (i.e., cap-and-trade program) to meet the specified requirements.

On December 11, 2008, CARB approved the *Climate Change Proposed Scoping Plan: A Framework for Change* (Scoping Plan; CARB 2008) to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program.

The key elements of the Scoping Plan include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards.
- Achieving a statewide renewables energy mix of 33 percent.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions.
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

In addition to outlining the reduction strategies needed to achieve the mandate of AB 32, the Scoping Plan contains an estimate of the GHG emissions (i.e., 596 MMT CO₂E per year) that would result in 2020 if no action was taken by the State of California to regulate GHG emissions. The Scoping Plan refers to this emissions estimate as the "business as usual" (BAU) condition. Based on this estimate, CARB found that California's GHG emissions must be reduced by about 29 percent (or 169 MMT CO₂E) from the 2020 BAU condition in order to return to 1990 levels (i.e., 427 MMT CO₂E per year), in accordance with AB 32 (CARB 2008).

CARB is required to update its Scoping Plan at least once every 5 years. The First Update to the Climate Change Scoping Plan (Scoping Plan Update; CARB 2014b) was approved by the CARB Board on May 22, 2014. The Scoping Plan Update builds upon the initial Scoping Plan with new strategies and recommendations. For example, the update identifies nine key focus areas or sectors that include different emission sources (energy, transportation, agriculture, water, waste management, and natural and working lands), along with short-lived climate pollutants, green buildings, and the cap-and-trade program. The update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions in these nine focus areas through strategic planning and targeted low carbon investments. The update further recommends efforts to reduce so-called short-lived climate pollutants (black carbon, methane, and hydrofluorocarbons). These pollutants remain in the atmosphere for shorter periods of time and have much larger GWPs compared to CO₂. The update also adjusts California's target GHG emissions for 2020 at 431 MMT CO₂E based on use of GWP factors in the Intergovernmental Panel on Climate Change's Fourth Assessment Report, which was published in 2007. Based on the revised estimates of expected 2020 emissions identified in the 2011 Supplement to the Functional Environmental Document and updated 1990 emissions levels identified in the First Update to the Scoping Plan, achieving the 1990 emission level would require a reduction of 76 MMT CO₂E (down from 507 MMT CO₂E) or a reduction by approximately 15 percent to achieve in 2020 emissions levels in the BAU scenario.

The Scoping Plan Update defines CARB's climate change priorities for the next 5 years and sets the groundwork to reach California's long-term climate goals set forth in EOs S-3-05 and B-16-12. The update also highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals defined in the initial Scoping Plan and finds that California is on track to meet the near-term 2020 target. CARB also observes in the update that the efforts pursued to achieve the near-term 2020 goal have created a framework for ongoing climate action that can be built upon to maintain and continue economic sector-specific reductions beyond 2020, as required by AB 32. The update also recommends that a statewide mid-term target and mid-term and long-term sector targets be established in furtherance of the 2050 goal established by EO S-3-05 to reduce California's GHG emissions to 80 percent below 1990 levels, although no specific recommendations have been made to date.

California Code of Regulations Title 24

Title 24 of the California Code of Regulations was established in 1978, and serves to enhance and regulate California's building standards.

Part 6 of Title 24 specifically establishes energy efficiency standards for residential and nonresidential buildings constructed in the State of California in order to reduce energy demand and consumption. Part 6 is updated periodically to incorporate and consider new energy

efficiency technologies and methodologies. The most recent amendments, referred to as the 2013 standards, became effective on July 1, 2014. Buildings compliant with the 2013 standards would require 25 percent less energy on average for lighting, heating, cooling, ventilation, and water heating than the 2008 standards. Additionally, the standards save 200 million gallons of water per year and avoid 170,500 tons of GHG emissions per year (CEC 2014).

Title 24 also includes Part 11, known as California's Green Building Standards (CALGreen). The most recent version of the CALGreen standards took effect in January 2014, and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and state-owned buildings, as well as schools and hospitals. The mandatory standards require:

1. 20 percent mandatory reduction in indoor water use relative to specified baseline levels.
2. 50 percent of construction and demolition waste must be diverted from landfills.
3. Low-pollutant emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle boards.
4. Mandatory inspections of energy systems to ensure optimal working efficiency.

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented per the discretion of local agencies and applicants. CALGreen's Tier 1 standards call for a 15 percent improvement in energy requirements, more strict water conservation, 65 percent diversion of construction and demolition waste, 10 percent recycled content in building materials, 20 percent permeable paving, 20 percent cement reduction, and cool/solar reflective roofs. CALGreen's more rigorous Tier 2 standards call for a 30 percent improvement in energy requirements, more strict water conservation, 75 percent diversion of construction and demolition waste, 15 percent recycled content in building materials, 30 percent permeable paving, 25 percent cement reduction, and cool/solar reflective roofs.

Senate Bill 375

In August 2008, the legislature passed and on September 30, 2008, Governor Arnold Schwarzenegger signed Senate Bill (SB) 375 (Steinberg), which addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans.

SB 375 requires CARB to assign regional GHG reduction targets for the automobile and light truck sector for 2020 and 2035 to specified geographic regions throughout California. The targets are required to consider the emission reductions associated with vehicle emission standards (see AB 1493), the composition of fuels (see Executive Order S-1-07), and other CARB-approved measures to reduce GHG emissions. Regional metropolitan planning organizations (MPOs), such

as the San Diego Association of Governments (SANDAG), are then responsible for preparing a Sustainable Communities Strategy (SCS) within the Regional Transportation Plan (RTP), the goal of which is to establish a development plan for the region, which, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets. If an SCS is unable to achieve the GHG reduction target, the MPO must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to Government Code Section 65080(b)(2)(K), a sustainable communities strategy does not: (i) regulate the use of land; (ii) supersede the land use authority of cities and counties; or (iii) 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.

SB 375 also provides incentives for streamlining CEQA requirements by substantially reducing the requirements for "transit priority projects," as specified in SB 375, and eliminating the analysis of the impacts of certain residential projects on global warming and the growth-inducing impacts of those projects when the projects are consistent with the SCS or Alternative Planning Strategy.

Assembly Bill 1493

In response to the transportation sector accounting for more than half of California's CO₂ emissions, AB 1493 (Pavley) was enacted on July 22, 2002. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined to be vehicles whose primary use is noncommercial personal transportation in the state. The bill required that CARB set the 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 resulted in a reduction of about 22 percent in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards – when fully phased in – will result in a reduction of about 30 percent.

Before these vehicle standards could go into effect, the EPA had to grant California a waiver under the federal CAA, which ordinarily preempts state regulation of motor vehicle emission standards. The waiver was granted on June 30, 2009. Subsequently, on March 29, 2010, the CARB Executive Officer approved revisions to the standards to harmonize the state program with the national program for 2012 to 2016 model years (see "Joint Final Rule for Vehicle Standards" above). The revised regulations became effective on April 1, 2010.

Executive Order B-16-12

Governor Brown issued EO B-16-12 on March 23, 2012. The EO requires that state entities under the governor's direction and control support and facilitate the rapid commercialization of zero-emission vehicles. It orders CARB, the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and other relevant agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish goals and benchmarks to for 2015, 2020, and 2025. On a statewide basis, the EO establishes a target reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels by 2050.

Executive Order S-1-07

Issued on January 18, 2007, EO S-1-07 sets a declining Low Carbon Fuel Standard (LCFS) for GHG emissions measured in CO₂-equivalent gram per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10 percent by 2020. The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered.

CARB adopted the implementing LCFS regulation in April 2009, which is expected to increase the production of biofuels, including those from alternative sources such as algae, wood, and agricultural waste. In addition, the LCFS is anticipated to drive the availability of plug-in hybrid, battery electric, and fuel-cell power motor vehicles, such that 20 percent of the fuel used in motor vehicles will be replaced with alternative fuels by 2020.

Executive Order S-14-08

On November 17, 2008, Governor Schwarzenegger issued EO S-14-08. This order focused on the contribution of renewable energy sources to meet the electrical needs of California, while reducing the GHG emissions from the electrical sector. The order requires that all retail suppliers of electricity in California serve 33 percent of their load with renewable energy by 2020. Furthermore, the order directs state agencies to take appropriate actions to facilitate reaching this target.

Assembly Bill 341

Adopted by Governor Jerry Brown on October 5, 2011, this assembly bill requires the Department of Resources, Recycling, and Recovery to increase the diversion of solid waste to 75 percent by 2020. This is achieved through source reduction, recycling, and composting. AB 341 requires businesses to arrange for recycling services and requires local governments to

implement a commercial recycling program. Reducing the disposal of recyclable materials in the commercial solid waste stream will conserve landfill capacity and contribute to a reduction in GHG emissions associated with solid waste.

Senate Bill X1 2

On April 12, 2011, Governor Jerry Brown signed SB X1 2, which expanded California's renewable energy program by establishing a goal of 20 percent of the total electricity sold to retail customers in California per year, by December 31, 2013, and 33 percent by December 31, 2020, and in subsequent years. Under the bill, 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. In addition to the retail sellers covered by SB 107, SB X1 2 added local publicly owned electric utilities to the renewable energy program.

The CPUC is responsible for enforcement of the renewable portfolio program as to all retail sellers, while the CEC and CARB will enforce the requirements relative to for local publicly owned electric utilities.

Senate Bill 32

In September 2016, the Governor signed SB 32 (Pavley; California Global Warming Solutions Act of 2006: emissions limit) into law. SB 32 would require that CARB ensure that statewide GHG emissions are reduced to 40 percent below the 1990 level by 2030, thereby codifying the attainment of the 2030 reduction goal identified in EOs B-30-15 and S-3-05. However, currently there are no proposed or adopted significance thresholds for analyzing post-2020 emissions for development projects in California, there are no adopted statewide or local plans to reduce emissions 40 percent below 1990 levels by 2030, and the regulatory framework to achieve the 2030 target is in its infancy.

Senate Bill 97

In August 2007, the legislature enacted SB 97 (Dutton), which directs the Governor's Office of Planning and Research (OPR) to develop guidelines under CEQA for the mitigation of GHG emissions. OPR was to develop proposed guidelines by July 1, 2009, and the Natural Resources Agency was directed to adopt the guidelines by January 1, 2010. On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the CEQA Guidelines.

On June 19, 2008, OPR issued a technical advisory regarding the analysis of GHG emissions in CEQA documents (OPR 2008). The advisory indicated that a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities, should be identified and estimated. The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures that are necessary to reduce GHG emissions to a level that is less than significant.

OPR submitted to the Natural Resources Agency amendments to the CEQA Guidelines relating to GHG emissions. The amendments became effective on March 18, 2010 and establish several new CEQA requirements concerning the analysis of GHGs, including the following:

- Requiring a lead agency to “make a good faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project” (Section 15064(a))
- Providing a lead agency with the discretion to determine whether to use quantitative or qualitative analysis or performance standards to determine the significance of GHG emissions resulting from a particular project (Section 15064.4(a))
- Requiring a lead agency to consider the following factors when assessing the significant impacts from GHG emissions on the environment:
 - The extent to which the 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
 - 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. (Section 15064.4(b))
- Allowing lead agencies to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures, including offsets that are not otherwise required (Section 15126.4(c)).

The amended guidelines also establish two new guidance questions regarding GHG emissions in the Environmental Checklist set forth in CEQA Guidelines Appendix G:

- Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The amendments do not establish a GHG emission threshold, and instead allow a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts.¹ The Natural Resources Agency also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions.²

Local

County of San Diego Climate Action Plan

The 2011 County General Plan EIR outlined a specific mitigation measure (Mitigation Measure CC-1.2) that called for the preparation of a Climate Action Plan (CAP). The County of San Diego developed and adopted (June 2012) the CAP to address the issues of climate change as it relates to growth in the County, and to protect the environment for visitors and residents alike (County of San Diego 2012). After the CAP was adopted by the County, a lawsuit was filed by the Sierra Club in April 2013 and the San Diego County Superior Court set aside the approval of the County CAP. Therefore, this analysis does not rely on the CAP.

San Diego County Greenhouse Gas Inventory

The University of San Diego, School of Law's Energy Policy Initiative Center (EPIC 2013) prepared a regional GHG inventory. This San Diego County Greenhouse Gas Inventory consisted of a detailed inventory that took into account the unique characteristics of the region in calculating emissions. The study found that emissions of GHGs must be reduced by 33 percent below BAU in order for San Diego County to achieve 1990 emission levels by 2020.

2050 Regional Transportation Plan

On October 28, 2011, the SANDAG Board of Directors adopted the 2050 Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS), which articulates future plans for San Diego's regional transportation system over the next 40 years (SANDAG 2011). The SCS, which is included as part of the RTP, details the regional strategy for reducing GHG emissions to state-mandated levels over time as required by SB 375, including measures encouraging infill development. The San Diego region was the first in California to produce an RTP with a SCS.

¹ "The CEQA Guidelines do not establish thresholds of significance for other potential environmental impacts, and SB 97 did not authorize the development of a statement threshold as part of this CEQA Guidelines update. Rather, the proposed amendments recognize a lead agency's existing authority to develop, adopt and apply their own thresholds of significance or those developed by other agencies or experts" (CNRA 2009, p. 84).

² "A project's compliance with regulations or requirements implementing AB 32 or other laws and policies is not irrelevant. Section 15064.4(b)(3) would allow a lead agency to consider compliance with requirements and regulations in the determination of significance of a project's greenhouse gas emissions" (CNRA 2009, p. 100).

After SANDAG's 2050 RTP/SCS was adopted, a lawsuit was filed by the Cleveland National Forest Foundation and others. On November 24, 2014, and after recirculation of the project's Draft EIR, Division One of the Fourth District Court of Appeal issued its decision in *Cleveland National Forest Foundation v. SANDAG*, Case No. D063288. In its decision, the Fourth District affirmed the trial court decision that SANDAG abused its discretion when it certified the EIR for the 2050 RTP/SCS because it did not adequately analyze and mitigate GHG emission levels after year 2020.

As a response, SANDAG has prepared the San Diego Forward Plan (SANDAG 2015), which unites two of SANDAG's major planning efforts into one, with the next update of the RTP/SCS and an update of the Regional Comprehensive Plan (RCP) that was adopted in 2004.

San Diego Forward

On October 9, 2015, SANDAG adopted "San Diego Forward," a Regional Plan that merged its RCP with the 2050 RTP and the Sustainable Communities Strategy (Regional Plan). The Regional Plan now serves as the blueprint for how the San Diego region will grow and how SANDAG will invest in transportation infrastructure to provide more choices, strengthen the economy, promote a healthy environment, and support thriving communities. The Regional Plan sets forth the following six general objectives: Habitat and Open Space Preservation, Regional Economic Prosperity, Environmental Stewardship, Providing Mobility Choices, Partnerships/Collaboration with neighboring entities, and creating Healthy and Complete Communities.

At the core of the Regional Plan is a Sustainable Communities Strategy that charts a course towards lowering GHG emissions and includes the following five building blocks:

- A land use pattern that accommodates our region's future employment and housing needs, and protects sensitive habitats, cultural resources, and resource areas.
- A transportation network of public transit, Managed Lanes and highways, local streets, bikeways, and walkways built and maintained with reasonably expected funding.
- Managing demands on our transportation system (also known as Transportation Demand Management, or TDM) in ways that reduce or eliminate traffic congestion during peak periods of demand.
- Managing our transportation system (also known as Transportation System Management, or TSM) through measures that maximize the overall efficiency of the transportation network.
- Innovative pricing policies and other measures designed to reduce the number of miles people travel in their vehicles, as well as traffic congestion during peak periods of demand

The Regional Plan includes the following set of principles that will guide the development of the region's future transportation network:

- The SANDAG investment plan will be built with financial resources that are reasonably expected to be available between now and 2050.
- A more efficient transportation network will be achieved through two key strategies: effectively managing the overall system (TSM) and effectively managing demands on the system (TDM) with innovative technologies be integrated into both. The result will be maximized efficiency in the transportation network, which ultimately can lower GHG emissions.
- Managing parts of the network, such as adding Managed Lanes and transit only lanes on freeways, which encourage people to carpool and use public transit to bypass bottlenecks.
- The road toward a more sustainable San Diego region should include vehicles that use cleaner, alternative sources of energy with SANDAG playing an important role in promoting this transition.

County of San Diego General Plan

The County of San Diego's General Plan, as a whole, provides goals, policies, and objectives that aim to reduce GHG emissions and increase sustainable development and planning within the County's jurisdiction consistent with AB 32 (see Table 1-1 of the General Plan for a full list of policies that relate to climate change). Specifically, the General Plan Conservation and Open Space Element discusses climate change in conjunction with air quality and energy. An underlying premise of the San Diego County General Plan is to conserve natural resources and develop lands and infrastructure more sustainably in the future. Planning and developing a truly sustainable future depends on a healthy environment, strong economy, and the social well-being of the County's residents.

Select applicable General Plan goals and policies are listed below:

- 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.
- 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.

- 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
- 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.
- 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.
- COS-17.6 Recycling Containers. Require that all new land development projects include space for recycling containers. COS-19.1 Sustainable Development Practices. Require land development, building design, landscaping, and operational practices that minimize water consumption

2.6.3 Analysis of Project Effects and Determination as to Significance

Guidelines for the Determination of Significance

The State of California has developed guidelines to address the significance of climate change impacts based on Appendix G of the CEQA Guidelines, which contains two significance criteria for evaluating GHG emissions of a project. A project would have a significant environmental impact if it would:

1. Generate greenhouse gas 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 greenhouse gases.

Similarly, CEQA Guidelines Section 15064.4 discusses the significance evaluation for GHG emissions. Section 15064.4(a) recognizes that the determination of the significance “calls for a careful judgment” by the lead agency that is coupled with lead agency discretion to determine whether to (1) use a model or methodology, and/or (2) rely on a qualitative analysis or performance based standards. Section 15064.4(b) further states a lead agency should consider the following non-exclusive list of factors when assessing the significance of GHG emissions:

1. The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
2. The extent to which 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 statewide, regional, or local plans for the reduction or mitigation for GHG emissions.

Neither the State of California nor the SDAPCD has adopted emission-based thresholds for GHG emissions under CEQA. Instead, the CEQA Guidelines authorize the lead agency to consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence (14 CCR 15064.4(a) and 15064.7(c)). The OPR Technical Advisory titled *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review* states that “public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from CEQA projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact” (OPR 2008, p. 4). Furthermore, the advisory document indicates that “in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a ‘significant impact,’ individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice. “A lead agency should make a good-faith effort, based on the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project” (14 CCR 15064.4).

Climate Change Analysis Criteria

A number of agencies throughout the state, including multiple air districts, have drafted and/or adopted varying threshold approaches and guidelines for analyzing GHG emissions and climate change in CEQA documents. However, none of these are binding; they are only recommendations for consideration by CEQA lead agencies. The recent California Supreme Court decision in the *Center for Biological Diversity et al. vs. California Department of Fish and Wildlife, The Newhall Land and Farming Company* (November 30, 2015, Case No. S217763) (“Newhall Ranch decision”) suggested that several approaches for determining significance of GHG emissions are appropriate, but did not preclude other methodologies that may be used by lead agencies. Some of these approaches are discussed below in the context of the proposed project.

Performance-Based Reductions

Performance-based thresholds are based on a percentage reduction from a projected future condition. For example, reducing future BAU emissions by the AB 32 target of 29 percent

(below 2020 BAU levels) through a combination of state measures, project design features (e.g., renewable energy), or mitigation is a performance-based threshold. The performance-based approach is based on the project's reduction in emissions from an unmitigated condition. With the Newhall Ranch decision, relating a given project to the achievement of state reduction targets would likely require adjustments to ARB's statewide BAU model not only to isolate new development emissions but also to consider unique geographic conditions that would be required to use the BAU performance-based methodology for a specific project. To date, this type of adjustment to the statewide BAU target has not been formulated and therefore is not appropriate for the project's analysis.

Compliance with a Qualified GHG Reduction Plan

Under this approach, a qualified plan may be used in the cumulative impact analysis for later projects when the analysis "identifies those requirements specified in the plan that apply to the project." For a GHG reduction plan to be considered a qualified plan, it must meet certain criteria established under CEQA Guidelines Sections 15183.5(b) and 15064.4, also specified above. Consequently, if a project is consistent with a local CAP that was created to meet AB 32's GHG targets, then the project would be considered consistent with statewide GHG reduction goals for 2020. As discussed above, the San Diego County Superior Court set aside the approval of the County CAP and the County has not completed a new CAP that would set forth GHG reduction targets and reduction measures. Therefore, is not appropriate for the project's analysis.

Numerical Bright-Line

The thresholds published by the California Air Pollution Control Officers Association (CAPCOA) were used to for determining determine the need for additional analysis and mitigation for GHG-related impacts under CEQA. The CAPCOA white paper recommends a 900 MT CO₂E/year screening level to determine the size of projects that would be likely to have a less than considerable contribution to the cumulative impact of climate change (see Table 2.6-4, Project Sizes that Would Typically Require a Climate Change Analysis). Projects exceeding this would require further analysis and mitigation, as necessary (CAPCOA 2008).

Efficiency Metric (Per Service Population)

Another type of quantitative threshold is an efficiency-based threshold. Efficiency-based thresholds represent the GHG efficiency needed for development to achieve California's GHG emissions target established under AB 32. The intent of AB 32 is to accommodate a population and economic growth in California, but in a way that achieves a lower rate of GHG emissions statewide. One commonly accepted approach for addressing the potential significance of a project's impacts due to GHG emissions is to demonstrate a reduced rate of emissions per

service population (i.e., GHG emissions per capita based on the number of residents and employees) as compared to the existing rate of emissions per service population for the local area. A number of air districts in the State of California have recommended or adopted efficiency metric or “service population” thresholds as a method for analyzing cumulative GHG emissions and significance of impacts under CEQA. A project’s “service population” refers to a project’s residents plus employees that would be generated by the proposed project’s development. This efficiency metric is expressed as MT CO₂E per service population per year (MT CO₂E/service population/year).

The efficiency metric assesses the GHG efficiency of a project on a “service population (SP)” basis (efficiency metric = project emissions divided by the sum of the number of jobs and the number of residents provided by a project). The metric represents the rate of emissions needed to achieve a fair share of the state’s emissions mandate embodied in AB 32. The use of “fair share” in this instance indicates the GHG efficiency level that, if applied statewide, would meet the AB 32 emissions target and support efforts to reduce emissions beyond 2020. With a reduced rate of emissions per service population, California can accommodate expected population growth and achieve economic development objectives, while also abiding by AB 32’s emissions target and supporting efforts to reduce emissions beyond 2020.

2.6.4 Generation of Construction-Related and Operational GHG Emissions

As discussed above, there are multiple potential thresholds and methodologies for evaluating project-level GHG emissions consistent with CEQA, depending on the circumstances of a given project. As noted by CAPCOA, “CEQA guidance that allows multiple methodologies to demonstrate GHG significance will facilitate the determination of significance for a broad range of projects/plans that would otherwise be difficult to address with a single non-compound methodology. Even though there could be multiple ways that a project can determine GHG significance using a decision-tree approach, only one methodology need be included in any single CEQA document prepared by the applicant. The presence of multiple methodologies to determine significance is designed to promote flexibility rather than create additional analysis overhead” (CAPCOA 2008, p. 37).

The thresholds of significance that will be applied to the proposed project’s GHG emissions for both the 2020 and post-2020 periods is based upon the state average efficiency ratio of 4.9 MT CO₂E/year/service population for the year 2020 and applies the 5.2 percent per year reduction to the efficiency metric for projects that will have a full buildout year post 2020. The 5.2 percent per year between 2020 and 2050 is necessary to achieve the 2030 and 2050 emissions reduction goals of SB 32 and S-3-05 according to CARB’s Scoping Plan Workshop Slides.

The efficiency metric is based on the AB 32 GHG reduction target and GHG emissions inventory prepared for CARB's 2008 Scoping Plan. To develop the efficiency metric for 2020, land-use-driven sectors in CARB's 1990 GHG inventory were identified and separated to tailor the inventory to land use projects, which is a total of 286.7 MMT CO₂E. This process removes emission sources not applicable to land use projects. The land-use-driven sector inventory for 1990 was divided by the service population projections for California in 2020 (total of 59,130,546 service population). The resultant GHG efficiency metric applicable to the project would be 4.9 MT CO₂E /service population/year for the year 2020. The efficiency metric allows the threshold to be applied evenly to most project types and employs an emissions inventory composed only of emission sources from land-use-related sectors. The efficiency metric allows lead agencies to assess whether any given project or plan would accommodate population and employment growth in a way that is consistent with the emissions limit established under AB 32. Table 2.6-5, Warner Ranch GHG Efficiency Metric, details the project efficiency metric.

This was compared to the efficiency metric that would be derived by the GHG inventory that was prepared for during preparation of the County's General Plan, which took into account the unique characteristics of the region in calculating emissions. Although the County is in the process of preparing a CAP that would further refine the emissions inventories based on more current information, it still provides a frame of reference in which to compare with the state's efficiency metric. The information from the General Plan and efficiency target derived from this information is provided for informational purposes and provides a frame of reference. This methodology is intended to demonstrate a link between the statewide goal of AB 32, the state's efficiency metric, and a project-level GHG analysis in accordance with the Newhall Ranch decision. The Newhall Ranch decision permits lead agencies to either use the BAU methodology with supplemental information about the relationship between a project and the assumptions in the state's Scoping Plan or to use other methodologies.

During the County's General Plan update process in 2011, a GHG inventory was prepared to identify the sources and amounts of GHG emissions generated from the County's facilities and operations as well as the emissions of the land uses within the jurisdictional boundaries of the County ("2005 GHG Inventory"). Emissions were calculated using two separate methodologies, one for the Government Analysis and another for the Community Analysis for the years 1990 and 2006. The University of San Diego's Energy Policy Initiative Center calculated GHG emissions for the County for the community-wide sectors for the years 1990 and 2006, with emissions projections for 2020. It took into account the unique characteristics of the region in calculating emissions. The 2005 GHG Inventory concluded that total emissions in the County of San Diego in 2005 comprised approximately 4,512,580 MT CO₂E (EPIC 2008). Accordingly, and based on the Scoping Plan's recommendation, a 15 percent reduction from the baseline year GHG emissions in the County of San Diego would have totaled approximately 3,835,693 MT

CO₂E/year. Thus, the total 2020 GHG emission target for the County would be 3,835,693 MT CO₂E/year. It should be noted that data presented in the General Plan represent preliminary estimates. The County is in the process of preparing a Climate Action Plan (CAP) where refined emissions inventories based on more recent data are being included.

According to SANDAG, the unincorporated County of San Diego is estimated to have a total 2020 population of 545,451 with approximately 114,338 jobs. Thus, the 2020 service population for the County would be 659,789 (SANDAG 2016). In order to achieve the County emission level of 3,835,693 MT CO₂E, based on the County General Plan, the required efficiency target in 2020 would be approximately 5.8 MT CO₂E per service population (SANDAG 2016). By using the state's efficiency metric, the more conservative efficiency metric is applied that is based on the most current information available at this time. The comparison to the efficiency target derived from the County's 2005 GHG Inventory provides evidence about the relationship between the project and the assumptions in the state's Scoping Plan.

GHG emissions calculated for the project using the latest California Emissions Estimator Model (CalEEMod) 2013.2.2 air quality model, which was developed by ENVIRON International Corporation for South Coast Air Quality Management District (SCAQMD), and which has been approved by the San Diego Air Pollution Control District (SDAPCD) and the County for GHG emission calculations; see Appendix O.

Horizon Year 2020 and 2025 Analysis

Construction Impacts

Construction of the Warner Ranch project is anticipated to last approximately seven and half years through demolition to complete buildout. Proposed construction phases and associated durations include the following:

- Demolition (2 weeks)
- Mass grading, including blasting operations (27 months)
- Trenching (3 months)
- Fine grading (3 months)
- Paving (2 months)
- Building construction (60 months)
- Architectural coatings (58 months)

All phases of construction of the proposed project are scheduled to commence in 2017, with the completion of the first buildings in late 2020. Completion of construction of the project is anticipated in 2025. Details of the construction schedule including equipment hours of operation and duration, worker trips, and equipment mix are included in Appendix O.

During construction, GHGs would be emitted through the use of equipment and various construction-related vehicle trips for transport and removal of material and site access. Construction of the proposed project would require significant blasting operations, with approximately 6 tons of explosives for 22 days each month for 6 months. The estimated grading and construction of the project is anticipated to produce approximately 9,385.17 MT CO₂E. Additionally, blasting operations unique to construction of the project would also produce an additional 8,758.74 MT CO₂E. The total GHG emissions produced from the construction is estimated as 18,143.91 MT CO₂E. When this total is annualized over a projected 20-year life span of the project, the annual construction emissions would be approximately 907.20 MT CO₂E per year, as outlined in Table 2.6-6, Estimated Construction GHG Emissions. Information regarding modeling assumptions and outputs, and detailed calculations of construction related GHG emissions are provided in Appendix O.

Operational Impacts

Following construction, operation of the proposed project would produce GHG emissions associated with daily traffic trips associated with on-site residential uses, electricity and natural gas use, solid waste, and electricity consumption for water use. Operations emissions by category are outlined in Table 2.6-7, 2020 GHG Emissions.

Area Sources

Area sources of GHG emissions include usage of fireplaces and landscaping as part of regular maintenance. The CalEEMod area source module was used to calculate direct sources of GHG emissions located at the project site; see Appendix O. For this analysis, it was assumed that all residential units would include a hearth option based on CalEEMod default assumptions. The project would be required to only utilize natural gas hearth options (see Section 2.2, mitigation measure **M-AQ-3** of this EIR).

Motor Vehicles

The proposed project would contribute to GHG emissions through the vehicular traffic generated from new resident's daily trips for work, shopping, and other vehicle trips. As outlined within the traffic impact study prepared for the proposed project, approximately 7,570 daily trips are estimated once the proposed project is fully operational. Project trip distribution and expected

average trip distances were taken from the traffic study distribution and vehicle miles traveled (VMT) analysis prepared for the project and included as Appendix O.

GHG emissions attributable to the project without project design features would be produced from the total estimated 23,790,000 VMT for the project; see Appendix O, which includes a VMT reduction assessment. This VMT accounts for relationships between the proposed project land uses, the surrounding land uses, and the transportation facilities. Annual GHG emissions from motor vehicle trips associated with the project were quantified using the EMFAC 2011 model for the year 2020 and 2025; see Tables 2.6-7 and 2.6-8 (2020 and 2025 GHG Emissions).

In addition to the project design features described below that would have the effect of reducing potential GHG emissions, the project has been designed to locate workforce housing in close proximity to employment centers, as described by the Special Study designation of the site in the Pala/Pauma Community Plan. The project's Market Feasibility Study (Appendix S) indicates that offering homes priced primarily under \$400,000 would make them affordable to workforce households employed within the Pala Competitive Market Area (CMA). The project offers 246 multifamily unit types ranging from \$210,000 to \$306,000, 148 small detached lots ranging from \$300,000 to \$360,000 and 242 detached 4,000-square-foot lots ranging from \$378,000 to \$420,000. Of these units affordable to workforce households, it is conservatively estimated (and based on the County's Housing Element policies regarding affordable housing) that the 246 multifamily units would be the most likely location where employees within the CMA could take advantage of a shorter commute by living close to work, though the number of units could potentially be much greater.

The proposed project would include 246 multifamily workforce housing units on site to allow for employees of the surrounding casinos and employment centers to live within 17 miles of work (**PDF-AQ-7**, see Section 2.2 for details). The major employers within these 17 miles include Pala Casino, Pauma Casino, Harrah's Casino, and Valley View Casino, as well as employers in Valley Center. Assuming an equal amount of project residents are employed within each of the listed employment areas, the average home-work trip length would be approximately 10.3 miles. As indicated in Appendix O, the total VMT for the project is reported to be 23,790,000. Of this total, 32.9 percent, or 7,826,910 VMT, are associated with home-to-work-related trip miles for the entire project. Under a 10.3-mile work trip length scenario, the reduction in MF home-work VMT is from 5,193,498 to 4,153,982. The difference in annual VMT, from "standard" to "modified for multifamily", is 1,039,516 and represents a 4.4 percent reduction in total VMT (1,039,516 / 23,790,000).

Additionally, the proposed project's vehicular GHG emissions would be further reduced by statewide measures including the Low Carbon Fuel Standard implemented under EO S-01-07 (approximately 10 percent reduction), Advanced Clean Cars program (approximately 2.4 percent

reduction in emissions from light-duty autos and trucks), and from the tire pressure regulation program (approximately 0.6 percent reduction). Table 2.6-7 outlines the motor vehicle emissions for the proposed project without project design features, and Table 2.6-8 shows the project's GHG emissions with reductions proposed through compliance with statewide requirements and project design features.

Operational Electricity Use

The electricity demand for the residential uses within the proposed project were estimated using CalEEMod defaults for these land uses. Based on this electricity use, the CO₂, CH₄, and N₂O emitted through electricity generation were estimated, as described in Appendix O.

Several statewide requirements for reduced electricity use would also reduce associated GHG emissions. County of San Diego building permit requirements ensure that the project would utilize the most current building code at the time residential units are constructed, which is assumed to be the Title 24 2013 standards. In addition to these requirements, the project design would include installing energy-efficient appliances (e.g., Energy Star), in compliance with BE-4 of CAPCOA's Quantification document. The project also includes a photovoltaic solar system as a mitigation measure; see Section 2.6.7, Mitigation, for further details.

Table 2.6-7 outlines the electricity-use-related GHG emissions for the project without project design features, and Table 2.6-8 shows the reduced GHG emissions through compliance with statewide requirements.

Operational Natural Gas Use

The residential uses associated with the proposed project would result in GHG emissions from the use of natural gas for water and space heating. Natural gas demand for the proposed project was determined using CalEEMod defaults for the residential land uses on the project site and the methods described in Appendix O.

County of San Diego building permit requirements ensure that the project would utilize the most current building code at the time residential units are constructed, which is assumed to be the Title 24 2013 standards. Therefore, similarly to electricity use on site, natural gas emissions would be reduced through increased efficiency from upgrades from the 2008 to 2013 building codes. (Note: the CalEEMod that is used to estimate project-related GHG emissions calculates energy emissions using the 2008 standards.)

Table 2.6-7 outlines the natural gas use related GHG emissions for the proposed project without project design features, and shows the proposed project's GHG emissions with reductions from compliance with statewide requirements.

Operational Solid Waste Emissions

The residential and park land uses associated with the proposed project would generate solid waste that would result in GHG emissions during decomposition at landfills. Waste generation for the residential and park land uses were based on CalEEMod defaults and waste generation for the fire station was calculated using information from the U.S. Census Bureau, as described in Appendix O.

- **PDF-GHG-1:** The project design includes recycling collection service that will operate in accordance with the goals of AB 341, and separate recycling and waste containers would be provided on site. All green waste will be diverted from landfills and recycled as mulch. Additionally, the proposed project would comply with the 75 percent diversion rate of waste from landfills to recycling centers under AB 341, which would be a 25 percent increase over the unmitigated 2020 GHG emissions.

A conservative 25 percent reduction in GHG emissions was assumed for the proposed project. Table 2.6-7 outlines the solid waste related GHG emissions for the proposed project without project design features, and Table 2.6-8 shows the proposed project's GHG emissions with reductions through compliance with statewide requirements and project design features.

Operational On-Site Water Use

Operation of the proposed project would use both indoor and outdoor water for the residential, park, and fire station land uses on the project site. Electricity generated to convey the water to the project site would create indirect GHG emissions. Water consumption for the proposed project was estimated using CalEEMod default values and the California Department of Water Resources information (see Appendix O).

- **PDF-GHG-2:** Design of the proposed project includes low flow water fixtures that are compliant with the 2013 California Green Building Standards codes.

Table 2.6-7 outlines the water-related GHG emissions for the proposed project without project design features, and shows the proposed project's GHG emissions with reductions through compliance with statewide requirements and project design features.

Conclusion

As shown in Table 2.6-7, the proposed project would result in an estimated 17,056.58 MT CO₂E per year from operational GHG emissions and amortized construction GHG emissions without applicable statewide requirements and project design features. With incorporation of project design features (**PDF-GHG-1** and **PDF-GHG-2**, as well as **PDF-AQ-7** and mitigation measure

M-AQ-3 from Section 2.2 of this EIR) and applicable statewide requirements the proposed project would generate approximately 12,884.31 MT CO₂E per year from operational GHG emissions and amortized construction GHG emissions.

The proposed project would be developed to include 246 multifamily and 534 single-family residential units and a fire station. It is anticipated that each residential unit will have 3.01 people per the project's Market Feasibility Study (Appendix S) the fire station is anticipated to have 10-12 employees on any given day. Therefore, the service population of the project would be 2,358 ($3.01 \times 780 + 10$).

Based on the project's mitigated levels of GHGs of 12,884.31 MT CO₂E and a service population of 2,358, the project would have an efficiency ratio of 5.5 MT CO₂E/year/service population. Therefore, based upon the 2020 target efficiency ratio, the project's efficiency ratio is above the required 4.9 MT CO₂E /year/service population.

Additionally, the project is anticipated to be fully buildout and operational in the year 2025 and therefore applying a 5.2 percent reduction to each year after 2020, the project would need to achieve an efficiency metric of approximately 3.6 MT CO₂E/year/service population. Modeling for the project was conducted within CalEEMod for the year 2025 and only accounts for to take credit for the anticipated increased in RPS, which was assumed to achieve a linear increase from 33 percent in 2020 to 50 percent in 2030 or an additional 8.5 percent in 2025. The modeling also accounts for reductions in transportation-related emissions as calculated by CalEEMod. The modeling demonstrates that the project's total rate of GHG emissions would continue to decrease due to improvements in fuel efficiency and fleet turnover related to the project's transportation. Additional reductions in the energy sector, and water relative to the degree water emissions would be affected by the de-carbonization of the electrical grid, are due to the continuing effects of RPS, which was linearly interpolated using the 2020 and 2030 standards. The modeling does not account for any additional reductions due to technological advancements in building efficiency, lighting, waste or increased regulations. It was determined from the modeling that the project's GHG emissions would be reduced to from 15,566.7 MT of CO₂E to 10,902.2 in the year 2025; see Table 2.6-8. Thus, the project would have an efficiency ratio of slightly less than 5.0 MT CO₂E/year/service population in the year 2025. Therefore, because the project's efficiency ratio is above the required 3.6 MT CO₂E/year/service population needed, the project's mitigated GHG emissions would be cumulatively considerable in the buildout year 2025.

In conclusion, the project's mitigated GHG emissions would be cumulatively considerable in the year 2020 and the year 2025 based on the County's efficiency ratio thresholds of 4.9 MT CO₂E/year/service population and 3.6 MT CO₂E/year/service population, respectively (**Impact GHG-CUM-1**).

For informational purposes, it should be noted that the project incorporates a combination of project design features and mitigation measures (**PDF-GHG-1** and **PDF-GHG-2**, as well as **PDF-AQ-7** and **M-AQ-3** from Section 2.2 of this EIR), in addition to other regulatory reductions which bring the estimated emissions from 17,056.58 MT CO₂E per year to 12,884.31 MT CO₂E in 2020. Therefore, the proposed project would achieve an overall 23.81 percent reduction in GHG emissions. A reduction of this size would meet and exceed the requirements of the Scoping Plan's estimates of 16 percent from BAU 2020 conditions. It should be noted that this percent reduction is included for informational purposes only and is not used to assess the significance of project impacts.

Additionally, in order to further reduce GHG emissions from mobile sources, the project includes the following design feature that was not calculated as part of this analysis:

- **PDF-GHG-3:** The HOA manager for the project will be directed to work with the major nearby employment centers to establish a shuttle program. The HOA manager will coordinate with the employment centers to provide identification and GIS information for participating households, as well as scheduling needs. The shuttle would provide direct door to door access from each participating household to the employment center. GHG reduction credits for this service were not considered within this analysis.

Horizon Year 2030 and 2050

The project's progress towards achieving the GHG reduction goals for mid-term year (2030) and horizon-year (2050) must be evaluated, as set forth in SB 32 and EO S-3-05, respectively. There is an ongoing debate regarding the need to assess a project's consistency with EOs in order to comply with CEQA and this issue is currently pending before the California Supreme Court.³ Therefore, in an exercise of caution, this EIR evaluates the project's progress towards achieving the GHG reduction goals identified in both EO B-30-15 and EO S-3-05 for 2050.

SB 32 set an interim target goal of reducing GHG emissions to 40 percent below 1990 levels by 2030. The interim target was established to ensure California would effectively continue its trajectory toward meeting or exceeding the long-term emission reduction statewide goal of reducing GHG emissions to 80 percent below 1990 levels by 2050 as set forth in EO S-3-05.

In accordance with CEQA Guidelines Section 15064.4(b)(3), this section evaluates whether the project's post-buildout GHG emissions trajectory would impede the attainment of the 2030 and

³ See case information webpage for California Supreme Court's consideration of *Cleveland Nat'l Forest Foundation v. SANDAG* (Case No. S223603), available at http://appellatecases.courtinfo.ca.gov/search/case/mainCaseScreen.cfm?dist=0&doc_id=2096944&doc_no=S223603 and accessed May 29, 2015.

2050 GHG reduction goals identified in SB 32 and S-3-05. Although SB 32 codifies the 2030 GHG reduction goal, there has been no legislative action to adopt the 2050 GHG reduction targets.

EO B-30-15 has been issued and set an interim target goal of reducing GHG emissions to 40 percent below 1990 levels by 2030, which was codified by SB 32. This interim target was established to ensure California would effectively continue its trajectory toward meeting or exceeding the long-term emission reduction goal of reducing GHG emissions to 80 percent below 1990 levels by 2050 as set forth in EO S-3-05.

No statutes or regulations have been adopted to translate these goals into emission reduction targets. No agency with subject matter expertise has adopted regulations to achieve these statewide goals at the project level, and available models cannot currently quantify all project-related emissions in those future years.

Nonetheless, this analysis renders a determination as to whether the project would conflict with or impede substantial progress towards the statewide reduction goals established by SB 32 for 2030 and by EO S-3-05 for 2050.

It should be noted, CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the First Update to the Climate Change Scoping Plan that “California is on track to meet the near-term 2020 greenhouse gas limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32” (see CARB 2014b, p. ES2). With regard to the 2050 target for reducing GHG emissions to 80 percent below 1990 levels, the First Update to the Climate Change Scoping Plan states:

“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 [MW] 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 percent 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, the experts at CARB attest that the state is on a trajectory to meet the 2020, 2030 and 2050 GHG reduction targets set forth in AB 32, SB 32, EO B-30-15, and EO S-3-05.

The following evaluates whether the project would interfere with the four main programs CARB identified to support its conclusions that the state is on a trajectory to meet the 2030 and 2050 GHG targets: (1) initiative to install 12,000 megawatts (MW) of renewable distributed energy by 2020; (2) CBC mandate to construct net zero energy homes after 2020; (3) existing building retrofits under AB 758; and (4) California’s Cap-and-Trade Regulations.

State's Goal to Install 12,000 MW of Renewable Distributed Generation Systems by 2020

The project does not interfere with the state's goal to install 12,000 MW of renewable distributed generation systems by 2020. The project includes a photovoltaic solar system on site to produce 4,756,002 kilowatt-hours (kWh) of electricity per year on average (see **M-GHG-1** in Section 2.6.7). Under current technology, this equates to up to 9,605 solar panels or an average of 12 solar panels on each single-family home, 2,858 solar panels on the multifamily units, 78 solar panels on the clubhouse, and 40 solar panels on the fire station, with each solar panel having an estimated rating of 285 watts. The actual capacity and/or conversion efficiency of the photovoltaic panels may alter the actual number of roofs or non-residential roof space requirements to meet the annual 3,346,200 kWh requirement at project buildout. Therefore, the project would not interfere or conflict with the state's goal of 12,000 MW of renewable distributed generation by 2020.

Non-Interference with Construction of Net-Zero Energy Homes after 2020

The project does not interfere with the ability of the California Building Commission to mandate constructing net-zero energy homes after 2020. The proposed project are anticipated to start in 2016 with construction and opening of the first buildings sometime in mid to late 2018 and full buildout late 2023. The project will be required to construct homes in conformance with the then-existing California Building Commission mandates for net-zero energy homes because the City does not issue occupancy permits for projects that do not comply with the California Building Code in effect at that time.

Non-Interference with AB 758's Existing Buildings Energy Efficiency Action Plan

The project will not interfere with the state's implementation of building retrofits to further energy efficiency for existing buildings under AB 758 or SB 350. AB 758, (Comprehensive Energy Efficiency in Existing Buildings Law). The California Energy Commission ("CEC") is tasked with developing and implementing a comprehensive program to increase energy efficiency in existing residential and nonresidential buildings that "fall significantly below the current standards in Title 24" (Pub. Resources Code, Section 25943(a)(1)). The project will be constructed in compliance with the applicable Title 24 standards and therefore will not interfere with CEC or other initiatives implemented to increase energy efficiency and reduce GHG emissions associated with buildings that do not adhere to Title 24 standards.

Other State Programs – Cap-and-Trade

The 2008 Scoping Plan identified cap-and-trade as a strategy for helping California reduce its GHG emissions (CARB 2008). A cap-and-trade program sets the total amount of GHG emissions allowable for facilities under the cap and allows covered sources, including producers

and consumers of energy, to determine the least expensive strategies to comply. AB 32 required CARB to adopt the cap-and-trade regulation by January 1, 2011, and the program itself began in November 2012. The Cap-and-Trade Regulation is being implemented in two stages. Electric generating utilities, electricity importers, and large industrial facilities became subject to the program beginning in 2013, and fuel distributors are brought under the cap in 2015. The project does not interfere with the state's implementation of this GHG reducing program because it is not an electric generating utility, electricity importer, large industrial facility, or fuel distributor. Rather, the project, like all consumers of energy and fuel from the sources regulated by Cap-and-Trade will have the related GHG emissions reduced from these resources as the generators must invest heavily in GHG reducing technologies in order to comply with the ever decreasing cap. In this sense, like all consumers paying for the use of fuel and electricity resources, the project and its residents will contribute financially toward these GHG reducing technologies.

Based on the foregoing, the project does not conflict with nor interfere with the state's implementation or SB 32's target of reducing statewide GHG emissions to 40 percent below 1990 levels by 2030 or EO S-3-05's target of reducing statewide GHG emission to 80 percent below 1990 levels by 2050 because it would not interfere with the state's implementation of GHG emission reduction measures described in CARB's First Update to the Scoping Plan, including the state providing for 12,000 MW of renewable distributed generation by 2020, the California Energy Commission mandating new zero energy homes in the building code after 2020, existing building retrofits under AB 758, and Cap-and-Trade Regulations. CARB identified these programs to 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 percent below 1990 levels by 2050.

It is expected that regulatory emission reductions will continue to improve well beyond what is known at this time, and that a project's emissions in 2030 and 2050 would also decrease from increased renewables, better vehicle emissions, reductions in water and waste along with increased building efficiencies and technologies. Given this, the project's GHG emissions will decrease with time as the state's existing and planned regulatory objectives are implemented and achieved. Also, as statewide regulatory initiatives, including those identified by CARB in the Scoping Plan are implemented, and other technological innovations occur, it is reasonable to assume that the statewide and the proposed project's GHG emissions levels would be reduced further.

2.6.5 Conflict with Regulations adopted for Purposes of Reducing GHG Emissions

Consistency with Applicable Plans (CEQA Guidelines Section 15064.4(b)(3))

A qualitative analysis of the project's compliance with applicable plans and policies for reduction of GHG emissions considers the project's potential to conflict with an applicable plan—the County of San Diego's General Plan—as that planning document contains various goals, policies and objectives related to the reduction of GHG emissions and global climate change. The project's potential to conflict with other applicable plans—SANDAG's 2050 RTP/SCS and San Diego Forward—adopted for the purpose of reducing GHG emissions at the regional level from passenger vehicles pursuant to SB 375, is identified as a factor that the lead agency should consider pursuant to CEQA Guidelines Section 15064.4(b)(3). In accordance with CEQA Guidelines Section 15064.4(b)(3), this section:

1. Analyzes the project's consistency with the County of San Diego's General Plan Goals and Policies intended to reduce GHG emissions
2. Analyzes the project's consistency with SB 375, including SANDAG's 2050 RTP/SCS

Consistency with Related County of San Diego's General Plan Policies

This section analyzes the project's potential to conflict with an applicable plan—the County of San Diego's General Plan—as that planning document contains various goals, policies, and objectives related to the reduction of GHG emissions and global climate change. The following discussion highlights the project's consistency with relevant GHG policies from the County's Conservation and Open Space Element.

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.

Consistent. The project encourages sustainability through green neighborhood practices incorporated into the project's Specific Plan or as a part of the various accompanying Tentative and Final Maps, Site Plans, Landscape Plans and EIR Technical Appendices that would be adopted as a part of the project. The project's land use plan accommodates an appropriate level of residential and supporting civic uses, including park, recreation and trail facilities, based on the analysis and recommendations of the Infrastructure (Appendix L) and Market Feasibility Study (Appendix S). Based on the project's Market Feasibility Study (Appendix S), it is the proximity to existing employment centers and the project's availability to existing and future employees that would reduce the average home-work trip length to 10.3 miles from 17 miles. A

2.7-mile public and private trails system is incorporated into the project, providing for opportunities to exercise. Drought-tolerant and native species are used wherever possible to minimize water usage and maintain the visual and rural character of the natural environment. The project also includes, among other features, 359 acres of open space and state-of-the-art water conservation irrigation systems. The project is located approximately half a mile (a 10-minute walk) from Pala Reservation's central core of commercial and community uses such as a convenience store, Post Office, and gas station.

Additionally, the project includes several project design features and mitigation measures relative to reduction of GHG emissions; see Table 1-3 in Chapter 1, Project Description, and Section 2.6.7, Mitigation, for detailed description.

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.

Consistent. The project is designed to encourage non-automotive movement throughout the community including walking and bicycling for individual communities, residents, and businesses. The project is located approximately half a mile (a 10-minute walk) from Pala Reservation's central core of commercial and community uses. A 2.7-mile public and private trails system will be incorporated into the project providing for opportunities to exercise. The proposed structures and project layout have been designed such that grading on the site would be minimized, allowing the majority of the site to remain in its natural state. Consistent with County plans, the project proposes a Resource Management Plan (RMP) in order to provide for the long-term management of the proposed open space preserve. The project is designed to locate workforce housing in close proximity to employment centers and will also include a fire station, parks and a community meeting area on site.

Additionally, the project includes several project design features and mitigation measures relative to reduction of GHG emissions; see Table 1-3 in Chapter 1, Project Description, and Section 2.6.7, Mitigation, for detailed description.

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.

Consistent. Per **M-AQ-2** from Section 2.2 of this EIR, all heavy diesel construction equipment shall be classified as Tier III at a minimum, and equipment during the last year of construction shall meet Tier IV guidelines at a minimum.

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.

Consistent. The Specific Plan requires orderly and sensitive design, and in particular, green building design and construction that maximizes energy efficiency, and minimizes air pollution. The proposed project would install energy efficient appliances, provide exterior outlets in the residential buildings for recharging of electric equipment (see **M-GHG-3** in Section 2.6.7), provide recycling collection service including diverting all green waste from landfills, and include water fixtures that are compliant with the 2013 California Green Building Standards codes. As previously described, the project includes several project design features and mitigation measures relative to reduction of GHG emissions; see Table 1-3 in Chapter 1, Project Description, and Section 2.6.7, Mitigation, for detailed description.

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.

Consistent. All project buildings will meet all applicable energy standards at time of building permit issuance, and—at a minimum—will meet the 2013 Title 24 standards.

COS-17.6 Recycling Containers. Require that all new land development projects include space for recycling containers.

Consistent. Per **PDF-GHG-1** and current regulations, the project would install recycling bins and would not impede the County from achieving the recycling requirement to achieve a 75 percent diversion from landfills.

COS-19.1 Sustainable Development Practices. Require land development, building design, landscaping, and operational practices that minimize water consumption.

Consistent. Per **PDF-GHG-2**, the project would install low flow water fixtures for interior use. Per **PDF-UT-1**, non-potable water shall be used for landscape and irrigation needs on the project site. Additionally, as indicated in the project's landscape plans, drought-tolerant and native species would be used wherever possible to minimize water usage and maintain the visual and rural character of the natural environment.

Consistency with SB 375 and SANDAG's 2050 RTP/SCS

At the regional level, SANDAG's San Diego Forward was adopted for the purpose of reducing GHG emissions attributable to passenger vehicles in the San Diego region. While San Diego Forward does not regulate land use or supersede the exercise of land use authority by

SANDAG's member jurisdictions (i.e., the County of San Diego and cities therein), the regional plan is a relevant regional reference document for purposes of evaluating the intersection of land use and transportation patterns, and the corresponding GHG emissions. The underlying purpose of San Diego Forward is to provide direction and guidance on future regional growth (i.e., the location of new residential and non-residential land uses) and transportation patterns throughout San Diego County as stipulated under SB 375. Although the proposed project would increase the density of residential land uses on the project site, it would also include a number of project design features to reduce GHG emissions that support the goals of San Diego Forward. For example, the project includes a photovoltaic solar system (**M-GHG-1**), electric vehicle charging stations (**M-GHG-2**), recycling measures and diverting green waste from landfills (**PDF-GHG-1**), low flow water fixtures (**PDF-GHG-2**), shuttle program with nearby employment centers (**PDF-GHG-3**), and provides 246 workforce housing units (**PDF-AQ-7**); see Table 1-3 in Chapter 1, Project Description, and Section 2.6.7, Mitigation, for detailed description.

Finally, neither the County nor the San Diego Air Pollution Control District has adopted GHG reduction measures that would apply to the GHG emissions associated with the proposed project. At this time, no mandatory GHG regulations would apply to implementation of the proposed project, and no conflict would occur. However, the County of San Diego's adopted General Plan emphasizes sustainable community design principles within its Goals and Policies. By locating the proposed project near existing and planned infrastructure, services, and jobs in a compact pattern of development, while at the same time promoting sustainability among its residents, the project has been designed around the guiding principles of the General Plan. Developing the proposed project in this manner meets the objectives for compliance with the mandates of AB 32 as well as SB 375, and is key to meeting the County's land use goals.

While the project site was not identified for development in SANDAG's San Diego Forward 2020 and 2035 forecasted development pattern maps, the project would be in-line with the SCS GHG benefits as the project would support and/or provide a range of housing types, services and jobs in a compact pattern of development located within half a mile (a 10-minute walk) of several diverse uses such as retail, services, civic facilities, and employment centers. This in turn, would reduce the size of required infrastructure improvements and the number and length of automobile trips. The project would provide a variety of housing opportunities located near major employment centers consistent with the smart growth concept of locating housing closer to retail, services, and jobs on smaller lots to reduce required infrastructure and the length of automobile trips while increasing community livability and preserving open space by compact development. The project's residential uses are within walking distance and are connected to the commercial services and civic uses of the central core of the Pala Reservation by an extensive community trail and SR 76.

Additionally, the project trip lengths would be shorter from the project site than from within the current areas in which the workforce currently reside. The Market Feasibility Study (Appendix S) identified that there are 9,531 jobs in the Pala CMA, most of which are filled by persons commuting into the CMA. Approximately 7,392 jobs from this total are filled by persons commuting into the CMA from other communities. Nearly 20 percent of these workers commute into the Pala CMA from Riverside County. The project will develop 246 units in the multifamily category. These units are conservatively identified as being in the likely price range for a typical employee within the CMA. (Although as stated in the project's Market Feasibility Study (Appendix S) the majority of units fall within the price range for affordability for workforce housing.) The major employers in the CMA are as follows: Pala Casino (which is ~0.5 miles from site), Pauma Casino (~7 miles), Harrah's Casino (~11 miles), and Valley View Casino (~16 miles), as well as employers in Valley Center. Assuming an equal amount of people from the project site are employed within each casino/employment center, the average home-work trip length would be modified to 10.5 miles. The total VMT for the project is reported to be 23,790,000. Of this total, 32.9 percent, or 7,826,910 VMT, are associated with home-to-work-related trip miles for the entire project.

Under a 10.3-mile work trip length scenario, the reduction in MF home-work VMT is from 5,193,498 to 4,153,982. The difference in annual VMT, from "standard" to "modified for multifamily," is 1,039,516 and represents a conservative 4.4 percent reduction in total VMT (1,039,516/23,790,000). For purposes of SB 375's underlying policy goals, the project will provide needed housing opportunities near these employment centers which will reduce the amount of VMT and corresponding GHG emissions as described above.

The project would also require less roadway infrastructure because of its compact design, which locates housing in close vicinity to employment centers, commercial and public services, and adjacent to a regional transportation corridor—SR 78.

Therefore, the proposed project is not anticipated to conflict with the goals of AB 32, the Scoping Plan, and the 2050 target in EO S-3-05 after implementing mitigation measures; see Section 2.6.7, Mitigation. Additionally, the proposed project would not conflict with the objectives of SB 375, San Diego Forward by SANDAG and the County's General Plan (see Table 2.6-9, Consistency Analysis with the Goals and Policy Objectives of SANDAG's San Diego Forward).

Existing Conditions (CEQA Guidelines 15064.4(b)(1))

In accordance with CEQA Guidelines Section 15064.4(b)(1), this analysis considers the "extent to which the project may increase or reduce [GHG] emissions as compared to the existing environmental setting." The project site is located in the Pala/Pauma Community

Planning Area and has been historically used for limited agriculture uses, having once been a working horse ranch with an estate, guesthouse, and avocado and citrus groves on a portion of the site. The remaining portion of the site consists of open space and habitat. The project site is currently vacant of development and is thus not a source of anthropogenic GHG emissions. Therefore, for purposes of establishing the existing environmental conditions on the project site, GHG emissions on the project site are conservatively assumed to be zero. The total GHG emissions for horizon year 2020 that would result from the project, including applicable reductions as described in Appendix O, would be greater than the existing emissions, increasing emissions on the project site over and above existing conditions by 13,019.47 MT CO₂E per year.

This numeric delta is disclosed in this EIR in accordance with CEQA Guidelines Section 15064.4(b)(1). While the project would result in an obvious change to the existing GHG emissions from the project site because climate change is occurring on a global scale, it is not meaningfully possible to quantify the scientific effect of new GHG emissions caused by a single project on discernible changes to the climate. Furthermore, the global scale of climate change makes it difficult to assess the significance of any residential project because the population will go to live somewhere based on the market and availability of residences.⁴ Unlike criteria pollutants, GHG emissions and climate change are not localized effects, and their magnitude cannot be quantified locally.⁵

Also, it should be noted that CAPCOA determined that a “land development project, such as a specific plan, does not necessarily create ‘new’ emitters of GHG, but would theoretically accommodate a greater number of residents in the state. Some of the residents that would move to the project could already be California residents, while some may be from out of state (or would ‘take the place’ of in-state residents who ‘vacate’ their current residences to move to the new project). Some also may be associated with new births over deaths (net population growth) in the state. The out-of-state residents would be contributing new emissions in a statewide context, but would not necessarily be generating new emissions in a global context.”⁶ Therefore,

⁴ SJVAPCD, *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA*, p. 3, December 17, 2009 [the SJVAPCD has concluded that “existing science is inadequate to support quantification of impacts that project specific GHG emissions have on global climatic change”]. See e.g., Council on Environmental Quality, *Revised Draft Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*, p. 2, December 2014 [“Climate change is a particularly complex challenge given its global nature and inherent interrelationships among its sources, causation, mechanisms of action, and impacts ...”].

⁵ CAPCOA, *CEQA & Climate Change*, p. 22, January 2008 [“[U]nlike criteria pollutants where individual districts are characterized by varying levels of pollutant concentrations and source types, [GHG emissions] and their attendant climate change ramifications are a global problem and, therefore, may suggest a uniform approach to solutions that ensure both progress and equity.”].

⁶ CAPCOA, *CEQA & Climate Change*, p. 73, January 2008.

this does not itself provide a meaningful or informative indicator of project impacts and is provided for informational purposes.

2.6.6 Significance of Impacts Prior to Mitigation

Based on the analyses above, the proposed project would have the following significant impact prior to mitigation:

Impact GHG-CUM-1 The project's GHG emissions would be cumulatively considerable based on the County's efficiency ratio thresholds.

2.6.7 Mitigation

The following mitigation would reduce **Impact GHG-CUM-1**, but not to a level less than significant.

M-GHG-1 The applicant will install solar panels on rooftop spaces (a photovoltaic solar system) on site as appropriate to produce approximately 4,756,002 kilowatt-hours (kWh) of electricity per year on average. (Under current technology, this equates to up to 9,605 solar panels or an average of 12 solar panels on each single-family home, 2,858 solar panels on the multifamily units, 78 solar panels on the clubhouse, and 40 solar panels on the fire station, with each solar panel having an estimated rating of 285 watts.) The actual capacity and/or conversion efficiency of the photovoltaic panels may alter the actual number of roofs or non-residential roof space requirements to meet the annual 4,756,002 kWh requirement at project buildout. With each building permit, the estimated rating of the solar panel to be installed will be provided to the County of San Diego to determine the overall remaining kilowatt-hours of electricity that are needed to comply with this measure.

M-GHG-2 The project will plumb for electric vehicle charging stations at all the residential units and include electric vehicle charging stations for 3 percent of the total off-street common area parking spaces required. A cabinet, box, or enclosure connected to a conduit linking the parking spaces with the electrical service will be provided for the installation of electric vehicle supply equipment to provide electric vehicle charging stations at those common areas.

M-GHG-3 The project will include outdoor electric outlets for all homes to facilitate use of electrical lawn and garden equipment.

M-GHG-4 Develop and provide to all homeowners an informative brochure to educate homeowners regarding water conservation measures, recycling, location of the electric vehicle charging stations and conduits, location of outdoor electric outlets

to promote using electrical lawn and garden equipment, and location of nearby resources such as dining and entertainment venues, small commercial centers, and civic uses to reduce vehicle miles traveled.

In addition, the following mitigation measure from Section 2.2 of the EIR would reduce **Impact GHG-CUM-1**, but not to a level less than significant.

M-AQ-3 Prior to the issuance of building permits, the project applicant shall ensure that project plans show the provision of only natural gas hearths.

As previously described, the project also includes recycling measures and diverting green waste from landfills (**PDF-GHG-1**), low flow water fixtures (**PDF-GHG-2**), a shuttle program with nearby employment centers (**PDF-GHG-3**), 246 workforce housing units (**PDF-AQ-7**), and drought-tolerant landscaping (**PDF-AE-3**); see Table 1-3 in Chapter 1, Project Description. After implementation of all emissions reductions that have been quantified, the project's emissions are reduced from 17,056.58 MT CO₂E to 12,884.31 MT CO₂E in the year 2020, and from 15,566.7 MT CO₂E to 10,902.2 in the year 2025. Conservatively, credit was not taken for all mitigation measures and design features described; see Appendix O for details. Specifically, the project's reduced emissions per year do not take credit for PDF-GHG-3, M-GHG-2, M-GHG-3, and M-GHG-4. This is in order to maintain a conservative analysis, and in some cases because the measures are not quantifiable.

It should be noted for informational purposes that the proposed project would achieve an overall 23.8 percent reduction in GHG emissions for the year 2020. A reduction of this size would meet and exceed the requirements of the scoping plans estimates of 16 percent from BAU 2020 conditions, although this is not a threshold or level of significance analyzed in this document for the purposes of CEQA.

Additionally, it should be noted that the study of GHG emissions and climate change is particularly complex due to its global nature and inherent interrelationships among its sources, causation, and mechanisms of action. Achieving GHG reduction targets, therefore, requires state and federal efforts, and cannot fall solely on individual projects. Many of the state and federal efforts are too speculative at this time to quantify, but these efforts should be acknowledged. For example, the CEC adopted the 2016 Title 24 standards in 2015, and assigning those standards with an effective date of January 1, 2017. Further, both the CEC and CPUC remain committed to their goal that all new residential construction in California achieves zero net energy standards by 2020. It is likely that a subsequent, more rigorous iteration of the Title 24 standards will apply to the project at the time of building permit issuance. These GHG emission and energy savings associated with those standards have not been quantified at this time because the savings are unknown.

It should also be noted that according to SANDAG, the unincorporated County of San Diego is estimated to have a total 2020 population of 545,451 with approximately 114,338 jobs. Thus, the 2020 service population for the County would be 659,789 (SANDAG 2016). In order to achieve the County emission level of 3,835,693 MT CO₂E, the required efficiency target in 2020 would be approximately 5.8 MT CO₂E per service population (SANDAG 2016). As previously described, the project would have an efficiency ratio of 5.5 MT CO₂E/year/service population and therefore would meet this target. However, in an effort to be conservative and to use current data, the project was analyzed utilizing a standard based on the state average efficiency ratio of 4.9 MT CO₂E/year/service population for the year 2020 and applied the 5.2 percent per year reduction to the underlying emissions used to develop the efficiency metric for projects that will have a full buildout year post 2020. As a result, in accordance with the project's efficiency ratio thresholds, the project's mitigated GHG emissions would be cumulatively considerable.

A bulk of the project's GHG emissions result from mobile sources, e.g. vehicles, and the project has been designed to locate workforce housing in close proximity to employment centers, thereby reducing VMT. The project's Market Feasibility Study (Appendix S) indicates that offering homes priced primarily under \$400,000 would make them affordable to workforce households employed within the Pala CMA. The project offers 246 multifamily unit types ranging from \$210,000 to \$306,000, 148 small detached lots ranging from \$300,000 to \$360,000 and 242 detached 4,000-square-foot lots ranging from \$378,000 to \$420,000. Of the units affordable to workforce households, the County has conservatively estimated (and based on the County's Housing Element policies regarding affordable housing) that the 246 multifamily units would be the most likely location where employees within the CMA could take advantage of a shorter commute by living close to work. Therefore, although the number of units could potentially be much greater, only 246 workforce housing units have been quantified in the GHG analysis; see Appendix O for details. Also, as listed in Section 1.1 of the EIR, project objective 2 is "contribute to improving the local jobs/housing imbalance in the Pala/Pauma Subregion by providing workforce housing that is in proximity to employment centers in the area, including the Pala Village Casino, Resort and Spa, other tribal casinos within the SR 76 corridor." The project, by nature, intends to provide jobs/housing balance in the immediate area and ultimately reduce VMT.

After analyzing and requiring all reasonable and feasible on-site mitigation measures for avoiding or reducing GHG-related impacts (see Appendix O of this EIR for CAPCOA mitigation strategies evaluation), the County has determined that additional off-site mitigation measures can further reduce impacts from GHG emissions to a less than significant level through the purchase of carbon offset credits to achieve the requisite reductions standards described below.

The carbon credits shall be purchased through any one of the following verifiable entities/registries: CARB, Climate Action Reserve, CAPCOA, any California Air Pollution

Control District (APCD) or Air Quality Management District (AQMD), or an equivalent verifiable registry. One example registry program is the CAPCOA GHG Reduction Exchange (GHG Rx). GHG Rx is a registry and information exchange designed specifically to benefit the state of California. Participating air districts will only quantify credits for projects in California that follow protocols approved by the CAPCOA Board.

M-GHG-5 Carbon Offsets – Construction Emissions: To ensure the project would result in less than significant construction-related GHG emissions, the project applicant shall complete the following:

Prior to issuance of the first grading permit, the applicant shall provide evidence to the County of San Diego (County) Planning & Development Services (PDS) that they have obtained a one-time purchase of carbon credits in the amount of 18,144 MT CO₂E (note: this number reflects the additional construction-related GHG impacts after applying all other mitigation and reductions), which would reduce the entire contribution of construction-related GHG emissions (see Table M-GHG-5). Construction emissions include all grading, site preparation, building construction and architectural coatings related emissions.

Table M-GHG-5
Expected Construction CO₂E Emissions Summary

	Bio-CO ₂	NBio-CO ₂	Total CO ₂	CH ₄	N ₂ O	CO ₂ E (MT)
Total	0.00	9,349.30	9,349.30	1.71	0.00	9,385.17
Blasting Emissions (Metric Tons)						8,758.74
Total (Blasting + Cumulative Construction Total)						18,143.91

Source: Appendix O.

M-GHG-6 Carbon Offsets – Operational Emissions: To ensure the project would result in less than significant operational-related GHG emissions, the project applicant shall complete one of the following two options. (Note: the project's operational emissions would be 10,902 MT CO₂E in the year 2025 at the time of full buildout; see Table M-GHG-6). Therefore, to achieve an efficiency ratio of 3.6 MT CO₂E/year/service population and maintain a less than significant level of GHG emissions, the project may only generate up to 8,489 MT CO₂E annually. Therefore, the project will need to reduce the annual emissions by 2,413 MT CO₂E until the year 2050. Executive Order (EO) S-3-05 established the goals that GHG emissions should be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. Therefore, there are no regulations pertaining to GHG emission goals post 2050.

It should be noted: as new federal, state and local regulations are adopted or increases in technology occur (for example, solar), this could reduce the amount of carbon credits needed to maintain a level of less than significant.

- (1) Prior to the recordation of the first final map, the applicant shall provide evidence to County PDS that they have obtained carbon credits in the amount of 2,413 MT CO₂E per year multiplied by the number of years from the commencement of the operational aspects of the project (conservatively calculated for this purpose from the date of the first Final Map approval) until the year 2050.

Evidence shall consist of documentation from a County-approved third party that the carbon credits have been obtained and meet the requirements stated herein. The amount of GHG credits may be reduced at the time of first final map issuance if the applicant can demonstrate with substantial evidence that changes in state regulation or law, or other increased building efficiencies have reduced the total MT CO₂E emitted by the project. This will require approval from the County Director of PDS.

- (2) Prior to recordation of each Final Map, the applicant shall obtain the amount of carbon offset credits required for each Final Map based upon the uses contained within that Final Map. Each Final Map shall include as an attachment a tracking table that identifies any previous offsets purchased, and the amount remaining.

The amount of GHG credits may be reduced at the time of each final map issuance if the applicant can demonstrate with substantial evidence that changes in state regulation or law, or other increased building efficiencies have reduced the total MT CO₂E emitted by the project. This will be included in the tabulation and will require approval from the County Director of PDS.

Evidence shall consist of documentation from a County-approved third-party verifier that the carbon credits have been obtained and meet the requirements stated herein. The amount of GHG credits may be reduced at the time of each final map issuance if the applicant can demonstrate with substantial evidence that changes in state regulation or law, or other increased building efficiencies have reduced the total MT CO₂E emitted by the project. This will require approval from the County Director of PDS.

Table M-GHG-6
Year 2025 GHG Emissions and Carbon Offsets per Land Use (metric tons)

CO₂E Generator (Unmitigated)	Single-Family CO₂E Emissions	Multifamily CO₂E Emissions	Fire Station CO₂E Emissions	Park CO₂E Emissions
Area (project)	813.679	374.841		
Electricity single family	1,247.559			
Electricity multifamily		349.667		
Electricity commercial			126.253	
Electricity park				25.982
Natural gas single family	792.817			
Natural gas multifamily		182.144		
Natural gas commercial			7.839	
Mobile (emissions including LCFS)	7,068.935	2,605.181	229.713	
Mobile (LCFS corrections)	706.894	260.518	22.971	
Waste	284.809	51.478	0.883	
Water	271.619	125.135	17.789	
Total	11,186.31	3,948.96	405.45	25.98
CO₂E Mitigation and Reductions	CO₂E Reduction	CO₂E Reduction	CO₂E Reduction	CO₂E Reduction
Area – mitigation measures	-426.224	-196.350		
Energy – electricity – single family	-67.715			
Energy – electricity – multifamily		-15.629		
Energy – electricity – RPS	-268.225	-75.178	-27.144	-5.586
Energy – natural gas – single family	-40.689			
Energy – natural gas – multifamily		-5.415		
9,605 solar panels (285 W)	-1076.396	-464.073	-6.495	-12.665
Mobile – LCFS reduce emissions by 10%	-706.894	-260.518	-22.971	
Mobile – Pavley II plus tire pressure	-174.603	-64.348	-5.674	
Mobile – 4.4% VMT reduction		-479.345		
Waste – install recycling bins	-71.202	-12.870	-0.111	-0.111
Water – install low flow water fixtures	-58.449	-26.928	-3.585	
Water – RPS	-58.40	-26.904	-3.825	
Mitigation and Reductions Total	-2,948.79	-1,627.56	-69.80	-18.36
Total with Mitigation and Reductions	8,237.52	2,321.41	335.64	7.62
Percent of Emissions and Carbon Offset	75.56%	21.29%	3.08%	0.07%
Carbon Offset Needed (Total 2,413.37)	1,823.51	513.88	74.30	1.69
Number of Units	534	246	1	1
Carbon Offset per Unit or Use	3.41	2.09	74.30	1.69

Source: Appendix O.

2.6.8 Conclusion

With implementation of all mitigation measures and project design features as previously described in this section, **Impact GHG-CUM-1 would be reduced** to a level less than significant.

Table 2.6-1
Global Warming Potentials and Atmospheric Lifetimes of Basic GHGs

GHG	Formula	100-Year GWP ^a	Atmospheric Lifetime (years)
Carbon dioxide	CO ₂	1	Variable
Methane	CH ₄	21	12 (± 3)
Nitrous oxide	N ₂ O	310	120
Sulfur hexafluoride	SF ₆	23,900	3,200

Source: IPCC 2007.

^a GWP = global warming potential; the warming effects over a 100-year time frame relative to other GHGs.

Table 2.6-2
California GHG Emissions by Sectors

Source Category	GHG Emissions (MMT CO ₂ E)	% of Total
Agriculture	37.86	8.3%
Commercial and residential	42.28	9.2%
Electricity generation	95.09 ^a	20.7%
Industrial uses	89.16	19.4%
Recycling and waste	8.49	1.9%
Transportation	167.38	36.5%
High-GWP substances	18.41	4.0%
Totals	458.68	100.00%

Source: CARB 2014a.

^a Includes emissions associated with imported electricity, which account for 44.07 MMT CO₂E annually.

Table 2.6-3
San Diego County GHG Emissions by Sectors

Source Category	GHG Emissions (MMT CO ₂ E)	% 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%
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%
Totals	34.5	100%

Source: EPIC 2013.

Table 2.6-4
Project Sizes that Would Typically Require a Climate Change Analysis

Project/Plan Type ^a	Screening Threshold
Single-family housing	50 dwelling units or more
Apartments/condominiums	70 dwelling units or more
General commercial office space	35,000 square feet or more
Retail space	11,000 square feet or more
Supermarket/grocery store	6,300 square feet or more

Source: County of San Diego 2016.

Notes: A determination on the need for a climate change analysis for project types not included in the table will be made on a case-by-case basis considering the 900 MT criterion.

^a A project with a combination of types may demonstrate compliance with the screening threshold through addition of the ratios of each contribution by the associated equivalency threshold.

Table 2.6-5
Warner Ranch GHG Efficiency Metric

California Service Population in 2020	
2020 Population Projection ¹	40,619,346
2020 Employment Projection ²	18,511,200
2020 Service Population	59,130,546
California Air Resources Board 1990 California GHG Inventory	
1990 Total Emissions	431 MMT CO ₂ e
1990 Non-land Use Emissions	144.3 MMT CO ₂ e
1990 Land Use Emissions	286.7 MMT CO ₂ e

¹ California Department of Finance, Demographic Research Unit. Report P-2, State and County Population Projections by Race/Ethnicity and Age (5-year groups) 2010 through 2060 (as of July 1); December 15, 2014.

² California Department of Finance, Employment Development Department. Industry Employment Projections, labor Market Information Division, 2010-2020; May 23, 2012.

Table 2.6-6
Estimated Construction GHG Emissions

Year	Bio-CO ₂	NBio-CO ₂	Total CO ₂	CH ₄	N ₂ O	CO ₂ E (MT)
2017	0.00	712.54	712.54	0.21	0.00	717.01
2018	0.00	1,811.31	1,811.31	0.55	0.00	1,822.89
2019	0.00	1,413.81	1,413.81	0.44	0.00	1,422.99
2020	0.00	1,055.94	1,055.94	0.12	0.00	1,058.39
2021	0.00	1,077.49	1,077.49	0.10	0.00	1,079.54
2022	0.00	1,065.82	1,065.82	0.10	0.00	1,067.83
2023	0.00	1,058.69	1,058.69	0.09	0.00	1,060.67
2024	0.00	1,061.00	1,061.00	0.09	0.00	1,062.97

**Table 2.6-6
Estimated Construction GHG Emissions**

Year	Bio-CO ₂	NBio-CO ₂	Total CO ₂	CH ₄	N ₂ O	CO ₂ E (MT)
2025	0.00	92.70	92.70	0.01	0.00	92.87
Total	0.00	9,349.30	9,349.30	1.71	0.00	9,385.17
Blasting Emissions (Metric Tons)						8,758.74
Total (Blasting + Cumulative Construction Total)						18,143.91
Yearly Average Construction Emissions (Metric Tons/year over 20 years)						907.20

Source: Appendix O.

Note: Expected construction emissions are based upon CalEEMod modeling assumptions for equipment and durations listed in Table 4.1.

**Table 2.6-7
2020 GHG Emissions**

CO ₂ E Generator (Unmitigated)	Total Project CO ₂ E Emissions (Metric Tons)
Area (project)	1,188.524
Electricity single family	1,247.559
Electricity multifamily	349.642
Electricity commercial	126.253
Electricity park	25.982
Natural gas single family	792.817
Natural gas multifamily	182.144
Natural gas commercial	7.839
Mobile (emissions including LCFS as reported from CalEEMod)	10,433.556
Mobile (LCFS corrections – CalEEMod includes 10% reduction)	1,043.356
Waste	337.170
Water	414.543
Construction (amortized over 20 years)	907.195
Total	17,056.578
CO ₂ E Mitigation and Reductions Methodology	CO ₂ E Reduction (Metric Tons)
Area – mitigation measures: Wood-burning hearths shall not be used. The project will be conditioned to only include natural gas burning hearth options – (Calculated in CalEEMod)	-622.574
Energy – electricity – single family: Project will be required to implement Title 24 2013 standards) – 36.4% reduction for Residential Uses	-67.715
Energy – electricity – multifamily: Project will be required to implement Title 24 2013 standards) – 23.3% reduction for Residential Uses	-15.629
Energy – electricity: Renewable Portfolio will reduce emissions by 13%	-227.427
Energy – natural gas – single family: Project will be required to implement Title 24 2013 standards) – 6.5% reduction for Single Family Homes	-40.689
Energy – Natural Gas – Multifamily – Project will be required to implement Title 24 2013 standards) – 3.8% reduction for Single Family Homes	-5.415

**Table 2.6-7
2020 GHG Emissions**

CO₂E Mitigation and Reductions Methodology	CO₂E Reduction (Metric Tons)
9,605 Panels (285W) – Solar Installation	-1,559.630
Mobile – LCFS reduce emissions by 10%	-1,043.356
Mobile – Pavley II Plus Tire Pressure Regulations – 2.47% combined reduction	-257.709
Mobile – reduction in workforce trips – Reduction of 4.4% mobile emissions	-504.984
Waste – Project would install recycling bins to and would increase recycling to 75% diversion. – Reduction factor of 25% applied – (Calculated in CalEEMod)	-84.293
Water – Project would install low flow water fixtures for interior use (Calculated in CalEEMod)	-88.961
Water – Renewable Portfolio will reduce energy usage for water supply, treatment and distribution by 13%	-53.89
Mitigation and Reductions Total	-4,172.27
Total Unmitigated GHG Emissions	17,056.58
Combined Total with Mitigation and Reductions	12,884.31
2020 Mitigation CO₂E Reduction (%)	24.46%

Source: Appendix O.

**Table 2.6-8
2025 GHG Emissions**

CO₂E Generator (Unmitigated)	Total Project CO₂E Emissions (metric tons)
Area (project)	1,188.520
Electricity single family	1,247.559
Electricity multifamily	349.642
Electricity commercial	126.253
Electricity park	25.982
Natural gas single family	792.817
Natural gas multifamily	182.144
Natural gas commercial	7.839
Mobile (emissions including LCFS as reported from CalEEMod)	9,903.829
Mobile (LCFS corrections – CalEEMod includes 10% reduction)	990.383
Waste	337.170
Water	414.543
Construction (amortized over 20 years)	907.195
Total	16,473.876

**Table 2.6-8
2025 GHG Emissions**

CO₂E Mitigation and Reductions Methodology	CO₂E Reduction (Metric Tons)
Area – mitigation measures: Wood-burning hearths shall not be used. The project will be conditioned to only include natural gas burning hearth options – (Calculated within CalEEMod)	-622.574
Energy – electricity – single family: Project will be required to implement Title 24 2013 standards) – 36.4% reduction for Residential Uses	-67.715
Energy – electricity – multifamily: Project will be required to implement Title 24 2013 standards) – 23.3% reduction for Residential Uses	-15.629
Energy – electricity – RPS: Using a linear assumption on RPS, 50%-33% from 2020 to 2030 is 1.7% per year or 8.5% added to 33% or 20% assumed per County so 13% +8.5% = 21.5%	-376.129
Energy – natural gas – single family: Project will be required to implement Title 24 2013 standards) – 6.5% reduction for Single Family Homes	-40.689
Energy – natural gas – multifamily: Project will be required to implement Title 24 2013 standards) – 3.8% reduction for Single Family Homes	-5.415
9,605 Panels (285W) – Solar Installation	-1,559.630
Mobile – LCFS reduce emissions by 10%	-990.38
Mobile – Pavley II plus tire pressure regulations: 2.47% combined reduction	-244.625
Mobile – reduction in workforce trips: Reduction of 2.98% mobile emissions	-479.345
Waste: Project would install recycling bins to and would increase recycling to 75% diversion. – Reduction factor of 25% applied – (Mitigation calculated within CalEEMod)	-84.293
Water: Project would install low flow water fixtures for interior use (Mitigation calculated within CalEEMod)	-88.961
Water – RPS: Using a linear assumption on RPS, 50%-33% from 2020 to 2030 is 1.7% per year or 8.5% added to 33% or 20% assumed per County so 13% +8.5% = 21.5%	-89.13
Mitigation and Reductions Total	-4,664.51
Total Unmitigated GHG Emissions	16,473.88
Combined Total with Mitigation and Reductions	11,809.36
2025 Mitigation CO₂E Reduction (%)	-28.31%

Source: Appendix O.

**Table 2.6-9
Consistency Analysis with the Goals and
Policy Objectives of SANDAG's San Diego Forward**

Goal	Policy Objectives	Consistency Analysis
<i>Mobility</i>		
The transportation system should provide the general public and those who move goods with convenient travel options. The system also should operate in a way that maximizes productivity. It should reduce the time it takes to travel and the costs associated with travel.	Tailor transportation improvements to better connect people with jobs and other activities	<i>Consistent.</i> The project's internal circulation plan facilitates interconnectivity between the residential units, civic and recreational uses, and adjacent commercial sites. The project does reduce some VMT to local employment centers but is an overall increase in VMT based on the existing land use plan.
	Provide convenient travel choices including transit,	<i>Consistent.</i> The project encourages non-vehicular modes of transportation through the inclusion of

Table 2.6-9
Consistency Analysis with the Goals and
Policy Objectives of SANDAG's San Diego Forward

Goal	Policy Objectives	Consistency Analysis
	intercity and high speed trains, driving, ridesharing, walking, and biking	pedestrian and bike paths. The project's transportation demand management program also would provide the means, resources and incentives for carpooling and ridesharing. The project includes PDF-GHG-3, which directs the HOA manager for the project to work with the major nearby employment centers to establish a shuttle program.
	Increase the use of transit, ridesharing, walking and biking in major corridors and communities	<i>Consistent.</i> The project is located approximately half a mile (a 10-minute walk) from Pala Reservation's central core of commercial and community uses. The project is designed to locate workforce housing in close proximity to employment centers and will also include a fire station, parks and a community meeting area on site. The project includes PDF-GHG-3, which directs the HOA manager for the project to work with the major nearby employment centers to establish a shuttle program.
	Provide transportation choices to better connect the San Diego region with Mexico, neighboring counties, and tribal nations	<i>Consistent.</i> The project is located approximately half a mile (a 10-minute walk) from Pala Reservation's central core of commercial and community uses. The project includes PDF-GHG-3, which directs the HOA manager for the project to work with the major nearby employment centers (some of which are located on tribal lands) to establish a shuttle program.
System Preservation and Safety		
The transportation system should be well maintained to protect the public's investments in transportation. It also is critical to ensure a safe regional transportation system.	Keep the region's transportation system in a good state of repair	<i>Consistent.</i> The project would contribute fair-share payments to significantly impacted roadway facilities to the extent required by law, so as to keep the transportation system in good repair.
	Reduce bottlenecks and increase safety by improving operations	<i>Consistent.</i> The project would contribute fair-share payments to address significant impacts relating to congestion along roadway facilities to the extent required by law.
	Improve emergency preparedness within the regional transportation system	<i>Consistent.</i> The project would provide educational materials concerning evacuation through the HOA.
Social Equity		
The transportation system should be designed to provide an equitable level of transportation services to all segments of the population.	Create equitable transportation opportunities for all populations regardless of age, ability, race, ethnicity, or income	<i>Consistent.</i> The project is designed to provide a range of housing and lifestyle opportunities on an equitable, non-discriminatory basis.
	Ensure access to jobs, services, and recreation for populations with fewer transportation choices	<i>Consistent.</i> The project will provide access to jobs, services and recreation on an equitable, non-discriminatory basis.

Table 2.6-9
Consistency Analysis with the Goals and
Policy Objectives of SANDAG's San Diego Forward

Goal	Policy Objectives	Consistency Analysis
<i>Healthy Environment</i>		
The transportation system should promote environmental sustainability and foster efficient development patterns that optimize travel, housing, and employment choices. The system should encourage growth away from rural areas and closer to existing and planned development.	Develop transportation improvements that respect and enhance the environment	<i>Consistent:</i> The environmental impacts of the transportation improvements proposed by the project are studied in the EIR and, where significant impacts have been identified, feasible mitigation has been identified. Where impacts are determined to be significant and unavoidable, the EIR evaluates all feasible measure and explains why the impact would remain significant.
	Reduce greenhouse gas emission from vehicles and continue to improve air quality in the region	<i>Consistent:</i> The project includes several measures to reduce GHGs related to mobile sources. For example, the project includes PDF-GHG-3 (shuttle program with nearby employment centers), and PDF-AQ-7 (providing 246 workforce housing units); see Table 1-3 in Chapter 1, Project Description, and Section 2.6.4 for detailed description.
	Make transportation investments that result in healthy and sustainable communities	<i>Consistent. The project is designed to facilitate non-vehicular modes of transportation and near employment centers, thereby reducing vehicle miles traveled and emissions.</i>

Source: SANDAG 2011, Table 2.1.

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