

4.7 GREENHOUSE GAS EMISSIONS

This section provides a discussion of global climate change (GCC), existing regulations pertaining to GCC, and an analysis of greenhouse gas (GHG) emissions associated with the proposed Tirador Residential Development Project (proposed project). This section summarizes information provided in the *Air Quality and Greenhouse Gas Emissions Analysis* (LSA 2020) that was prepared for the project. The *Air Quality & Greenhouse Gas Emissions Analysis* is included in Appendix B of this Draft Environmental Impact Report (EIR).

4.7.1 Scoping Process

The City of San Juan Capistrano (City) received 11 comment letters during the public review period of the Initial Study/Notice of Preparation (IS/NOP). For copies of the IS/NOP comment letters, refer to Appendix A of this EIR. No comment letters included comments related to GHG emissions.

4.7.2 Methodology

The *Air Quality and Greenhouse Gas Emissions Analysis* (LSA 2020) was prepared for the proposed project. Impacts related to GHG emissions and GCC were assessed in accordance with methodologies recommended by California Air Resources Board (CARB) and the Southern California Air Quality Management District (SCAQMD). GHG emissions are typically measured in terms of pounds or tons of “CO₂ equivalents” (CO₂e). The latest version of the California Emissions Estimator Model (CalEEMod) (v2016.3.2), which was released by the SCAQMD in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air quality districts on October 17, 2017, was used to determine construction and operational GHG emissions of the proposed project. The length of construction is based on estimates provided by the Project Applicant; construction of the proposed project is anticipated to start in 2021 and is estimated to last approximately 20 months. Operational GHG emissions were based on area source and energy use emissions as well as the estimated traffic trip generation rates from the *Traffic Impact Analysis for the Tirador Residential Development Project, San Juan Capistrano, Orange County, California* (TIA) (LSA, 2019) (Appendix H) which account for project-related vehicle emissions. Project-related emissions were modeled under the assumption that construction of the proposed project would occur in 11 phases (as shown in Table E of the *Air Quality and Greenhouse Gas Emissions Analysis*). The construction equipment list (as shown in Table F of the *Air Quality and Greenhouse Gas Emissions Analysis*) is used in the CalEEMod model to calculate on-site emissions for each construction phase.

4.7.3 Existing Environmental Setting

4.7.3.1 Global Climate Change

GCC is the observed increase in the average temperature of the Earth’s atmosphere and oceans along with other significant changes in climate (e.g., precipitation or wind) that last for an extended period of time. The term “global climate change” is often used interchangeably with the term “global warming,” but “global climate change” is preferred to “global warming” because it helps convey that there are other changes in addition to rising temperatures.

Climate change refers to any change in measures of weather (e.g., temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from natural factors (e.g., changes in the sun's intensity), natural processes within the climate system (e.g., changes in ocean circulation), or human activities (e.g., the burning of fossil fuels, land clearing, or agriculture). The primary observed effect of GCC has been a rise in the average global tropospheric¹ temperature of 0.36°F per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling shows that further warming may occur, which may induce additional changes in the global climate system during the current century. Changes to the global climate system, ecosystems, and the environment of the State could include higher sea levels, drier or wetter weather, changes in ocean salinity, changes in wind patterns, or more energetic aspects of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold, and increased intensity of tropical cyclones. Specific effects in the State might include a decline in the Sierra Nevada snowpack, erosion of the State's coastline, and seawater intrusion in the San Joaquin Delta.

Global surface temperatures have risen by 1.33°F ±0.32°F over the last 100 years. The rate of warming over the last 50 years is almost double that over the last 100 years (Intergovernmental Panel on Climate Change [IPCC] 2013). The latest projections, based on state-of-the-art climate models, indicate that temperatures in the State are expected to rise 3°F to 10.5°F by the end of the century (California Energy Commission 2006). The prevailing scientific opinion on climate change is that "most of the warming observed over the last 60 years is attributable to human activities" (IPCC 2013). Increased amounts of carbon dioxide (CO₂) and other GHGs are the primary causes of the human-induced component of warming. The observed warming effect associated with the presence of GHGs in the atmosphere (from either natural or human sources) is often referred to as "the greenhouse effect."²

4.7.3.2 Primary Greenhouse Gases

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced GCC are:³

- Carbon dioxide (CO₂);
- Methane (CH₄);
- Nitrous oxide (N₂O);
- Hydrofluorocarbons (HFCs);

¹ The troposphere is the zone of the atmosphere characterized by water vapor, weather, winds, and decreasing temperature with increasing altitude.

² The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." Just as the glass in a greenhouse allows heat from sunlight in and reduces the amount of heat that escapes, GHGs like CO₂, CH₄, and N₂O in the atmosphere keep the Earth at a relatively even temperature. Without the greenhouse effect, the Earth would be a frozen globe; thus, the *naturally occurring* greenhouse effect is necessary to keep our planet at a comfortable temperature.

³ The GHGs listed are consistent with the definition in Assembly Bill 32 (Government Code 38505), as discussed later in this memorandum.

- Perfluorocarbons (PFCs); and
- Sulfur hexafluoride (SF₆).

Over the last 200 years, human activities have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere and enhancing the natural greenhouse effect, which some scientists believe can cause global warming. While GHGs produced by human activities include naturally occurring GHGs (e.g., CO₂, CH₄, and N₂O), some gases (e.g., HFCs, PFCs, and SF₆) are completely new to the atmosphere. Certain other gases (e.g., water vapor) are short-lived in the atmosphere compared to these GHGs, which remain in the atmosphere for significant periods of time and contribute to climate change in the long term. Water vapor is generally excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes (e.g., oceanic evaporation). For the purposes of this analysis, the term “GHGs” will refer collectively to the six gases identified in the bulleted list provided above.

These gases vary considerably in terms of global warming potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. GWP is based on several factors, including the relative effectiveness of a gas in absorbing infrared radiation and the length of time that the gas remains in the atmosphere (“atmospheric lifetime”). The GWP of each gas is measured relative to CO₂, the most abundant GHG. The definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO₂ over a specified time period. GHG emissions are typically measured in terms of metric tons¹ of “CO₂ equivalents” (metric tons [MT] of CO₂e). For example, N₂O is 298 times more potent at contributing to global warming than CO₂. Table 4.7.A identifies the GWP for each GHG analyzed.

Table 4.7.A: Global Warming Potential for Selected Greenhouse Gases

Pollutant	Lifetime (Years)	Global Warming Potential (100-year) ¹
Carbon Dioxide (CO ₂)	~100 ²	1
Methane (CH ₄)	12	25
Nitrous Oxide (N ₂ O)	121	298

Source: CARB. First Update to the Climate Change Scoping Plan (2014).

¹ The 100-year global warming potential estimates are from Section 8.7.1.2 of The Global Warming Potential Concept in the IPCC 2007 Fourth Assessment Report (AR4). Website: http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm (accessed November 2019).

² CO₂ has a variable atmospheric lifetime and cannot be readily approximated as a single number.

CARB = California Air Resources Board

CO₂ = carbon dioxide

IPCC = Intergovernmental Panel on Climate Change

¹ A metric ton is equivalent to approximately 1.1 tons.

The following discussion summarizes the characteristics of the six primary GHGs.

Carbon Dioxide. In the atmosphere, carbon generally exists in its oxidized form as CO₂. Natural sources of CO₂ include the respiration (breathing) of humans, animals, and plants; volcanic outgassing; decomposition of organic matter; and evaporation from the oceans. Human-caused sources of CO₂ include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. The Earth maintains a natural carbon balance, and when concentrations of CO₂ are upset, the system gradually returns to its natural state through natural processes. Natural changes to the carbon cycle work slowly, especially compared to the rapid rate at which humans are adding CO₂ to the atmosphere. Natural removal processes (e.g., photosynthesis by land- and ocean-dwelling plant species) cannot keep pace with this extra input of human-made CO₂, and consequently the gas is building up in the atmosphere. The concentration of CO₂ in the atmosphere has risen approximately 30 percent since the late 1800s.¹

The transportation sector remained the largest source of GHG emissions in 2017, representing 40 percent of the State's GHG emission inventory.² The largest emissions category within the transportation sector is on-road, which consists of passenger vehicles (cars, motorcycles, and light-duty trucks) and heavy-duty trucks and buses. Emissions from on-road sources constitute more than 92 percent of the transportation sector total. Industry and electricity generation were the State's second- and third-largest categories of GHG emissions, respectively.

Methane. CH₄ is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources of CH₄ include fires, geologic processes, and bacteria that produce CH₄ in a variety of settings (most notably, wetlands) (USEPA 2010). Anthropogenic sources include rice cultivation, livestock, landfills and waste treatment, biomass burning, and fossil fuel combustion (e.g., the burning of coal, oil, and natural gas). As with CO₂, the major removal process of atmospheric CH₄—a chemical breakdown in the atmosphere—cannot keep pace with source emissions, and CH₄ concentrations in the atmosphere are increasing.

Nitrous Oxide. N₂O is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. N₂O is also a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion sources emit N₂O. The quantity of N₂O emitted varies according to the types of fuel, technology, and pollution control devices used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N₂O emissions in the State.

¹ California Environmental Protection Agency (Cal/EPA). 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature. Website: http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF (accessed November 2019).

² Cal/EPA. Air Resources Board. 2019. California GHG Emission Inventory. Website: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2017/ghg_inventory_trends_00-17.pdf (accessed January 2020).

Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride. HFCs are primarily used as substitutes for O₃-depleting substances regulated under the Montreal Protocol.¹ PFCs and SF₆ are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no aluminum or magnesium production in the State; however, the rapid growth in the semiconductor industry, which is active in the State, has led to greater use of PFCs. However, there are no known project-related emissions of these three GHGs; therefore, these substances are not discussed further in this analysis.

4.7.3.3 Emissions Sources and Inventories

An emissions inventory that identifies and quantifies the primary human-generated sources and sinks of GHGs is a well-recognized and useful tool for addressing climate change. This section summarizes the latest information on global, national, State, and local GHG emission inventories. However, because GHGs persist for a long time in the atmosphere, accumulate over time, and are generally well mixed, their impact on the atmosphere and climate cannot be tied to a specific point of emission.

Global Emissions. Worldwide emissions of GHGs in 2017 totaled 25.6 billion MT of CO₂e (UNFCCC 2019).² Global estimates are based on country inventories developed as part of the programs of the United Nations Framework Convention on Climate Change (UNFCCC).

United States Emissions. In 2017, the United States emitted approximately 6.456 billion MT of CO₂e, down from 7.4 billion MT of CO₂e in 2007. United States emissions decreased by 0.5 percent from 2016 to 2017. This decrease was largely driven by a decrease in emissions from fossil fuel combustion, which was a result of multiple factors including a continued shift from coal to natural gas and increased use of renewables in the electric power sector, and milder weather that contributed to less overall electricity use. In 2017, the total United States GHG emissions were approximately 13 percent less than 2005 levels (USEPA 2019).

State of California Emissions. According to CARB emission inventory estimates, the State emitted approximately 424 million metric tons of CO₂e (MMT of CO₂e) emissions in 2017. This is a decrease of 5 MMT of CO₂e from 2016 and below the 2020 target of 431 MMT of CO₂e (CARB 2019).

The CARB estimates that transportation was the source of approximately 37 percent of the State's GHG emissions in 2017. The transportation sector remains the largest source of GHG emissions, accounting for 40 percent (CARB 2019). Followed by electricity generation (both in-state and out-of-state) at 15 percent and industrial sources at 21 percent. The remaining sources of GHG emissions were residential and commercial activities at 9 percent, agriculture at 8 percent, high-GWP gases at 4.3 percent, and recycling and waste at 2 percent (CARB 2019).

¹ The Montreal Protocol is an international treaty that was approved on January 1, 1989, and was designated to protect the O₃ layer by phasing out the production of several groups of halogenated hydrocarbons that are believed to be responsible for O₃ depletion and are also potent GHGs.

² United Nations Framework Convention on Climate Change (UNFCCC). 2019. GHG data from UNFCCC. Website: <https://unfccc.int/process/transparency-and-reporting/greenhouse-gas-data/ghg-data-unfccc> (accessed December 2019).

Existing Project Site Emissions. The project site is currently undeveloped and vacant. The existing project site is characterized by dirt and scattered ruderal vegetation, is irregular in shape, and is relatively flat with a slight slope to the east/southeast. There are no current emissions associated with the undeveloped site.

4.7.4 Regulatory Setting

4.7.4.1 Federal Regulations

Prior to the last decade, there had been no concrete federal regulations of GHGs or major planning for climate change adaptation. The following are federal actions regarding GHGs and fuel efficiency over the last decade.

GHG Endangerment. In *Massachusetts vs. Environmental Protection Agency*, 549 U.S. 497, which was decided on April 2, 2007, the United States Supreme Court found that four GHGs, including CO₂, are air pollutants subject to regulation under Section 202(a)(1) of the federal Clean Air Act (CAA). The Court held that the USEPA Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the USEPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

- **Endangerment Finding:** The Administrator found that the current and projected concentrations of the six key well-mixed GHGs (i.e., CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆) in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare.

These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles, as discussed in the section titled “Clean Vehicles” below. After a lengthy legal challenge, the United States Supreme Court declined to review an Appeals Court ruling that upheld the USEPA Administrator’s findings.

4.7.4.2 State Regulations

Assembly Bill 32. In September 2006, the California State Legislature enacted AB 32, which requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. “GHGs” as defined under AB 32 include CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride (NF₃), has also been added to the list of GHGs. CARB is the State agency charged with monitoring and regulating sources of GHGs. CARB approved the 1990 GHG emissions level of 427 MMT of CO₂e on December 6, 2007. Therefore, emissions generated in California in 2020 are required to be equal to or less than 427 MMT of CO₂e. Emissions in 2020 in a “business as usual” (BAU) scenario were estimated to be 596 MMT of CO₂e, which do not account

for reductions from AB 32 regulations. At that level, a 28.4 percent reduction was required to achieve the 427 MMT of CO₂e 1990 inventory. In October 2010, CARB prepared an updated 2020 forecast to account for the recession and slower forecasted growth. The forecasted inventory without the benefits of adopted regulation is now estimated at 545 MMT of CO₂e. Therefore, under the updated forecast, a 21.7 percent reduction from BAU is required to achieve 1990 levels.

CARB Scoping Plan. The CARB 2008 Scoping Plan contains measures designed to reduce the State's emissions to 1990 levels by the year 2020 to comply with AB 32. The Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector having a different emission reduction target. Most of the measures target the transportation and electricity sectors.

In November 2017, CARB released the final 2017 Scoping Plan Update, which identifies the State's post-2020 reduction strategy. The 2017 Scoping Plan Update reflects the 2030 target of a 40 percent reduction below 1990 levels, set by Executive Order (EO) B-30-15 and codified by SB 32. Key programs that the Scoping Plan Update builds upon include the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, and much cleaner cars, trucks, and freight movement utilizing cleaner, renewable energy and strategies to reduce CH₄ emissions from agricultural and other wastes. The 2017 Scoping Plan establishes a new emissions limit of 260 MMT of CO₂e for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030.

Senate Bill 32 and Assembly Bill 197. On September 8, 2016, former Governor Brown signed SB 32 and its companion bill, AB 197. SB 32 requires the State to reduce statewide GHG emissions to 40 percent below 1990 levels by 2030, a reduction target that was first introduced in EO B-30-15. The new legislation builds upon the AB 32 goal of 1990 levels by 2020 and provides an intermediate goal to achieving EO S-3-05, which sets a statewide GHG reduction target of 80 percent below 1990 levels by 2050. AB 197 created a legislative committee to oversee regulators to ensure that CARB not only responds to the Governor, but to the Legislature as well.

Senate Bill 375 – Sustainable Communities and Climate Protection Act of 2008. Passing the Senate on August 30, 2008, SB 375 was signed by former Governor Brown on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: (1) requires Metropolitan Planning Organizations (MPOs) to include sustainable community strategies in their Regional Transportation Plans (RTPs) for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for implementation of the strategies.

Executive Order S-3-05. Former Governor Arnold Schwarzenegger announced on June 1, 2005, through EO S-3-05, the following reduction targets for GHG emissions:

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

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be a mid-term target. Because this is an Executive Order, the goals are not legally enforceable for local governments or the private sector.

Executive Order B-30-15. On April 29, 2015, former Governor Brown issued EO B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. EO B-30-15 aligns California's GHG reduction targets with those of leading international governments ahead of the United Nations Climate Change Conference in Paris in late 2015. In addition, EO B-30-15 sets a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050, and directs the CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of MMT of CO₂e. EO B-30-15 also requires the State's climate adaptation plan to be updated every 3 years, and for the State to continue its climate change research program, among other provisions. As with EO S-3-05, EO B-30-15 is not legally enforceable for local governments and the private sector. Legislation that would update AB 32 to make post-2020 targets and requirements a mandate is in process in the State Legislature.

Executive Order B-55-18 and Senate Bill 100. SB 100 and EO B-55-18 were signed by former Governor Brown on September 10, 2018. Under the existing renewables portfolio standard, 25 percent of retail sales are required to be from renewable sources by December 31, 2016, 33 percent by December 31, 2020, 40 percent by December 31, 2024, 45 percent by December 31, 2027, and 50 percent by December 31, 2030. SB 100 raises California's renewables portfolio standard requirement to 50 percent renewable resources target by December 31, 2026, and to achieve a 60 percent target by December 31, 2030. SB 100 also requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt hours of those products sold to their retail end-use customers achieve 44 percent of retail sales by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030. In addition to targets under AB 32 and SB 32, EO B-55-18 establishes a carbon neutrality goal for the State of California by 2045, and sets a goal to maintain net negative emissions thereafter. EO B-55-18 directs the California Natural Resources Agency, the California Environmental Protection Agency (Cal/EPA), the Department of Food and Agriculture, and the CARB to include sequestration targets in the Natural and Working Lands Climate Change Implementation Plan consistent with the carbon neutrality goal.

4.7.4.3 Regional Regulations

South Coast Air Quality Management District. The SCAQMD is the air pollution control agency for Orange County, as well as the urban portions of Los Angeles, Riverside, and San Bernardino Counties. The SCAQMD addresses the impacts to climate change from projects subject to SCAQMD permits as a lead agency if they are the only agency having discretionary approval for the project and acts as a responsible agency when a land use agency must also approve discretionary permits for the project. The SCAQMD acts as an expert commenting agency for impacts to air quality. This expertise carries over to GHG emissions, so the agency helps local land use agencies through the development of models and emission thresholds that can be used to address GHG emissions. All projects within the Basin are subject to SCAQMD rules and regulations in effect at the time of construction.

In 2008, SCAQMD formed a Working Group to identify GHG emissions thresholds for land use projects that could be used by local lead agencies in the Basin. The Working Group developed several different options that are contained in the SCAQMD 2008 draft guidance document titled *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans* (SCAQMD 2008b) that could be applied by lead agencies. On September 28, 2010, SCAQMD Working Group Meeting #15 provided further guidance, including a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency:

- **Tier 1.** Exemptions: If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.
- **Tier 2.** Consistency with a locally adopted GHG Reduction Plan: If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (i.e., city or county), project-level and cumulative GHG emissions are less than significant.
- **Tier 3.** Numerical Screening Threshold: If GHG emissions are less than the numerical screening-level threshold, project-level and cumulative GHG emissions are less than significant.

For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment of GHG emissions. SCAQMD, under Option 1, is proposing a "bright-line" screening-level threshold of 3,000 MT of CO₂e per year (CO₂e/yr) for all land use types or, under Option 2, the following land-use-specific thresholds: 1,400 MT of CO₂e/yr for commercial projects, 3,500 MT of CO₂e/yr for residential projects, or 3,000 MT of CO₂e for mixed-use projects. This bright-line threshold is based on a review of the Governor's Office of Planning and Research (OPR) database of CEQA projects. Based on its review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds identified above. Therefore, projects that do not exceed the bright-line threshold would have a nominal and therefore less than cumulatively considerable impact on GHG emissions:

- **Tier 4.** Performance Standards: If emissions exceed the numerical screening threshold, a more detailed review of the project's GHG emissions is warranted. SCAQMD has proposed an efficiency target for projects that exceed the bright-line threshold. The current recommended approach is per capita efficiency targets. SCAQMD is not recommending use of a percent emissions reduction target. Instead, SCAQMD proposes a 2020 efficiency target of 4.8 MT of CO₂e per year per service population (MT of CO₂e/yr/SP) for project-level analyses and 6.6 MT of CO₂e/yr/SP for plan-level projects (e.g., program-level projects such as general plans). The GHG efficiency metric divides annualized GHG emissions by the service population, which is the sum of residents and employees.

For the purpose of this analysis, a draft threshold of 3,500 MT of CO₂e/yr was used for residential developments such as the proposed project.

The SCAQMD has not presented a finalized version of these thresholds to the governing board.

The SCAQMD identifies the emissions level for which a project would not be expected to substantially conflict with any State legislation adopted to reduce statewide GHG emissions. As such, the utilization of a service population represents the rates of emissions needed to achieve a fair share of the State's mandated emissions reductions. Overall, SCAQMD identifies a GHG efficiency level that, when applied statewide or to a defined geographic area, would meet the year 2020 and post-2020 emissions targets as required by AB 32 and SB 32. If projects are able to achieve targeted rates of emissions per the service population, the State will be able to accommodate expected population growth and achieve economic development objectives, while also abiding by AB 32's emissions target and future post-2020 targets.

Regional Transportation Plan/Sustainable Communities Strategy. The Southern California Association of Governments (SCAG) is a regional council consisting of the following six counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. In total, the SCAG region encompasses 191 cities and over 38,000 square miles within Southern California. SCAG is the Metropolitan Planning Organization (MPO) serving the region under federal law, and serves as the Joint Powers Authority, the Regional Transportation Planning Agency, and the Council of Governments under State law. As the Regional Transportation Planning Agency, SCAG prepares long-range transportation plans for the Southern California region, including the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and the 2008 Regional Comprehensive Plan (RCP).

On April 7, 2016, SCAG adopted the 2016–2040 RTP/SCS. The 2016–2040 RTP/SCS is a long-range planning document that provides a common foundation for regional and local planning, policymaking, and infrastructure goals in the SCAG region. The overall vision for the 2016–2040 RTP/SCS is to allow for compact communities that are connected by numerous public transit options, are more walkable, and are safe for bicyclists. By promoting more compact communities and improving the regional transit system, SCAG's 2016–2040 RTP/SCS aims to reduce vehicular miles traveled and associated air quality and greenhouse gas emissions, promote active lifestyles, and fuel economic growth.

The 2016–2040 RTP/SCS establishes GHG emissions goals for automobiles and light-duty trucks for target years 2020 and 2035. Additionally, the RTP/SCS establishes an overall GHG target for the region consistent with both the statewide GHG-reduction targets for 2020 and post-2020 Statewide GHG reduction goals. Overall, the 2016–2040 RTP/SCS is supported by a combination of transportation and land use strategies that help the region achieve state GHG emission reduction goals and federal Clean Air Act requirements, preserve open space areas, improve public health and roadway safety, support the vital goods movement industry, and use resources more efficiently.

Regional Comprehensive Plan. In 2008, SCAG adopted the Regional Comprehensive Plan (RCP) for the purpose of providing a comprehensive strategic plan for defining and solving housing, traffic, water, air quality, and other regional challenges. The 2008 RCP has two primary objectives in implementing this strategic plan: (1) integrating transportation, land use, and air quality planning approaches, and (2) outlining key roles for public and private sector stakeholders to implement reasonable policies regarding transportation, land use, and air quality approaches. While the 2008 RCP outlines several policies to inform local decision-makers within the SCAG region with respect to

policy and planning decisions, these policies are considered recommendations and are not mandated by law.

4.7.4.4 Local Regulations

The City of San Juan Capistrano does not have any plans, policies, regulations, significance thresholds, or laws addressing climate change at this time. However, the City's General Plan Public Services and Utilities Element (1999) includes policies addressing energy conservation.

In April 2018, the City Council passed Resolution No. 18-04-17-04, which supports findings that human activities are a key contributor to climate change, as well as acknowledges that if left unaddressed, the consequences of climate change will adversely impact the public, especially the most vulnerable populations.

4.7.5 Thresholds of Significance

The thresholds for greenhouse gas emissions impacts used in this analysis are consistent with Appendix G of the *State CEQA Guidelines* and the City's *Local Guidelines for Implementing CEQA* (2019). The proposed project may be deemed to have a significant impact with respect to greenhouse gas emissions if it would:

Threshold 4.7.1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

Threshold 4.7.2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of greenhouse gases.

As stated above, for the purpose of this analysis, a draft threshold of 3,500 MT of CO₂e/yr was used for residential developments such as the proposed project.

4.7.6 Project Impacts

Threshold 4.7.1: Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant Impact.

Construction. During construction of the project, GHGs would be emitted through the operation of construction equipment and from worker and vendor vehicles, which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs (e.g., CO₂, CH₄, and N₂O). Furthermore, CH₄ is emitted during the fueling of heavy equipment. GHG emissions associated with project construction would occur over the short term from construction activities and would consist primarily of emissions from equipment exhaust. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

Table 4.7.B lists the annual GHG emissions from construction of the proposed project.

Table 4.7.B: Construction Greenhouse Gas Emissions

Construction Phase	Greenhouse Gas Emissions (MT/yr)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Site Preparation	26.32	<0.01	0	26.52
Existing Utility Relocation	26.32	<0.01	0	26.52
Grading	169.72	0.04	0	170.60
Backbone Infrastructure	49.85	0.01	0	50.22
Building Construction Model Phase 1 - 2021	176.90	0.03	0	177.54
Building Construction Model Phase 2 - 2022	127.66	0.02	0	128.13
Building Construction (Phase 2) - 2021	86.18	0.01	0	86.49
Building Construction (Phase 2) - 2022	288.92	0.04	0	289.98
Building Construction (Phase 3) - 2022	367.31	0.05	0	368.65
Paving (Phase 1) - 2022	21.35	<0.01	0	21.52
Architectural Coating (Phase 1) - 2022	5.03	<0.01	0	5.03
Building Construction (Phase 4) - 2022	365.08	0.05	0	366.40
Paving (Phase 2) - 2022	21.35	<0.01	0	21.52
Architectural Coating (Phase 2) - 2022	5.03	<0.01	0	5.03
Paving (Phase 3) - 2022	21.35	<0.01	0	21.52
Architectural Coating (Phase 3) - 2022	5.03	<0.01	0	5.03
Paving (Phase 4) - 2022	21.35	<0.01	0	21.52
Architectural Coating (Phase 4) - 2022	5.03	<0.01	0	5.03
Total Construction Emissions	1,789.77	0.30	0	1,797.24
Amortized over 30 years	59.66	<0.01	0	59.91

Source: Compiled by LSA (January 2020).

Note: Column totals may not add due to rounding from the model results.

CH₄ = methane

MT/yr = metric tons per year

CO₂ = carbon dioxide

N₂O = nitrous oxide

CO₂e = carbon dioxide equivalent

Per the SCAQMD guidance,¹ due to the long-term nature of the GHGs in the atmosphere, instead of determining significance of construction emissions alone, the total construction emissions are amortized over 30 years (an estimate of the life of the proposed project), added to the operational emissions, and compared to the applicable GHG significance threshold.

As shown in Table 4.7.B, construction of the proposed project would generate approximately 1,797.24 MT of CO₂e over the course of construction. The amortized construction emissions have been assessed as part of the annual average operation emissions, below. Because construction would be temporary (approximately 20 months), would cease upon project completion, and would not result in a permanent increase in emissions, impacts would be less than significant, and no mitigation is required.

¹ SCAQMD. 2008b. *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules, and Plans*. Website: [http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-\(ghg\)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2](http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2) (accessed April 2018).

Operation. Operation of the proposed project would generate GHG emissions from area and mobile sources and indirect emissions from stationary sources associated with energy consumption. Mobile-source emissions of GHGs would include project-generated vehicle trips associated with resident trips to and from the project site. Area-source emissions would be associated with activities including landscaping and maintenance of proposed land uses, natural gas for cooking and heating, and other sources. Increases in stationary-source emissions would also occur at off-site utility providers as a result of demand for electricity, natural gas, and water by the proposed use.

The GHG emission estimates presented in Table 4.7.C show the emissions associated with the level of development envisioned by the proposed project. Area sources include architectural coatings, consumer products, and landscaping. Energy sources include natural gas consumption for heating and cooking. As shown in Table 4.7.C, the proposed project, including amortized construction emissions, would generate 1,661.47 MT of CO₂e/yr. This level of project-related GHG emissions would fall below the SCAQMD bright-line screening threshold of 3,500 MT of CO₂e/yr for residential development. Therefore, GHG emissions generated by the project are not considered to be cumulatively contributable to statewide GHG emissions, and impacts would be less than significant. No mitigation is required.

Table 4.7.C: Operational Greenhouse Gas Emissions

Source	Pollutant Emissions (MT/yr)					
	Bio-CO ₂	NBio-CO ₂	Total CO ₂	CH ₄	N ₂ O	CO ₂ e
Total Construction emissions amortized over 30 years	0	59.66	59.66	<0.01	0	59.91
Area Sources	0	29.18	29.18	<0.01	<0.01	29.39
Energy Sources	0	334.23	334.23	0.01	<0.01	336.04
Mobile Sources	0	1,137.86	1,137.86	0.05	0	1,139.01
Waste Sources	18.55	0	18.55	1.10	0	45.95
Water Usage	2.73	39.27	42.00	0.28	<0.01	51.17
Total Proposed Project GHG Emissions	21.28	1,600.20	1,621.48	1.44	0	1,661.47

Source: Compiled by LSA (December 2019)

Note: Column totals may not add due to rounding from the model results.

Bio-CO₂ = biologically generated CO₂

CH₄ = methane

CO₂ = carbon dioxide

CO₂e = carbon dioxide equivalent

MT/yr = metric tons per year

N₂O = nitrous oxide

NBio-CO₂ = Non-biologically generated CO₂

SCAQMD = South Coast Air Quality Management District

Threshold 4.7.2: Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of greenhouse gases?

Less Than Significant Impact. The City of San Juan Capistrano does not currently have an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Applicable plans adopted for the purpose of reducing GHG emissions include CARB’s Scoping Plan and SCAG’s 2016–2040 RTP/SCS. A consistency analysis with these plans for the proposed project is presented below.

The CARB Scoping Plan is applicable to state agencies, but is not directly applicable to cities/counties and individual projects (i.e., the Scoping Plan does not require the City to adopt policies, programs, or regulations to reduce GHG emissions). However, new regulations adopted by the state agencies outlined in the Scoping Plan result in GHG emissions reductions at the local level. These regulations provide reductions in transportation emissions rates, increases in water efficiency in the building and landscape codes, and other statewide actions that would affect a local jurisdiction's emissions inventory from the top down. Statewide strategies to reduce GHG emissions include the low carbon fuel standards and changes in the corporate average fuel economy standards (e.g., Pavley I and Pavley II, and California Advanced Clean Cars program). Although measures in the Scoping Plan apply to State agencies and not the proposed project, the project's GHG emissions would be reduced by compliance with statewide measures that have been adopted since AB 32 and SB 32 were adopted. Therefore, the proposed project would not conflict with the CARB Scoping Plan, and impacts are considered less than significant.

San Juan Capistrano is a member city of the SCAG. SCAG's 2016–2040 RTP/SCS, adopted on April 7, 2016, is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. The RTP/SCS establishes GHG emissions goals for automobiles and light-duty trucks for 2020 and 2035 and establishes an overall GHG target for the region consistent with both the statewide GHG-reduction targets for 2020 and the post-2020 statewide GHG reduction goals. Table 4.7.D shows the proposed project's consistency with the 2016–2040 RTP/SCS goals.

As shown in Table 4.7.D, the proposed project would not conflict with the stated goals of the 2016–2040 RTP/SCS. As such, the proposed project would not interfere with SCAG's ability to achieve the region's 2020 and post-2020 mobile source GHG reduction targets outlined in the 2016–2040 RTP/SCS, and it can be assumed that regional mobile emissions will decrease consistent with the goals of the 2016–2040 RTP/SCS. Further, the proposed project is not considered regionally significant per *State CEQA Guidelines* Section 15206. Thus, the project would not conflict with the 2016–2040 RTP/SCS targets since those targets were established and are applicable on a regional level. Therefore, impacts related to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions would be less than significant, and no mitigation is required.

Table 4.7.D: Southern California Association of Governments RTP/SCS Goals

SCAG Measure	Project Consistency
<p>Goal 1: Align the plan investments and policies with improving regional economic development and competitiveness.</p>	<p>Not Applicable: This is not a project-specific policy and is therefore not applicable for the residential land uses.</p>
<p>Goal 2: Maximize mobility and accessibility for all people and goods in the region.</p>	<p>Consistent: Improvements to the transportation network in San Juan Capistrano are developed and maintained to meet the needs of local and regional transportation and to ensure efficient mobility. A number of regional and local plans and programs are used to guide development and maintenance of transportation networks, including but not limited to:</p> <ul style="list-style-type: none"> ● 2017 Orange County Congestion Management Program ● Caltrans Traffic Impact Studies Guidelines ● Caltrans Highway Capacity Manual ● SCAG RTP/SCS <p>The proposed project would not result in any significant impacts to the transportation network. Therefore, the proposed project would be consistent with Goal 2.</p>
<p>Goal 3: Ensure travel safety and reliability for all people and goods in the region.</p>	<p>Consistent: All modes of transit in San Juan Capistrano are required to follow safety standards set by corresponding regulatory documents. Pedestrian walkways and bicycle routes must follow safety precautions and standards established by local (e.g., City of San Juan Capistrano, County of Orange) and regional (e.g., SCAG, Caltrans) agencies. Roadways for motorists must follow safety standards established for the local and regional plans. The proposed project provides continuous sidewalks throughout the development to ensure pedestrian safety. Therefore, the proposed project would be consistent with Goal 3.</p>
<p>Goal 4: Preserve and ensure a sustainable regional transportation system.</p>	<p>Consistent: All new roadway developments and improvements to the existing transportation network must be assessed with some level of traffic analysis (e.g., traffic assessments, traffic impact studies) to determine how the developments would impact existing traffic capacities and to determine the needs for improving future traffic capacities.</p> <p>Therefore, the proposed project would be consistent with Goal 4.</p>
<p>Goal 5: Maximize the productivity of our transportation system.</p>	<p>Consistent: The local and regional transportation system would be improved and maintained to encourage efficiency and productivity. The City’s Public Works and Utility Department oversees the improvement and maintenance of all aspects of the public right-of-way on an as needed basis.</p> <p>The City also strives to maximize productivity of the region’s public transportation system (e.g., bus, bicycle) for residents, visitors, and workers coming into and out of San Juan Capistrano. The traffic study prepared for the proposed project determined that the proposed project would not result in any significant impacts to the transportation network. Therefore, the proposed project would be consistent with Goal 5.</p>

Table 4.7.D: Southern California Association of Governments RTP/SCS Goals

SCAG Measure	Project Consistency
<p>Goal 6: Protect the environment and health of our residents by improving air quality and encouraging active transportation (non-motorized transportation, such as bicycling and walking).</p>	<p>Consistent: The reduction of energy use, improvement of air quality, and promotion of more environmentally sustainable development are encouraged through the development of alternative transportation methods, green design techniques for buildings, and other energy reducing techniques. For example, development projects are required to comply with the provisions of the California Building and Energy Efficiency Standards and the Green Building Standards Code (CALGreen Code). The City also strives to maximize the protection of the environment and improvement of air quality by encouraging and improving the use of the region’s public transportation system (e.g., bus, bicycle) for residents, visitors, and workers coming into and out of San Juan Capistrano. The proposed project includes continuous sidewalks throughout the development and also includes a multi-use trail. Therefore, the proposed project would be consistent with Goal 6.</p>
<p>Goal 7: Actively encourage and create incentives for energy efficiency, where possible.</p>	<p>Not Applicable: This is not a project-specific policy and is therefore not applicable.</p>
<p>Goal 8: Encourage land use and growth patterns that facilitate transit and non-motorized transportation.</p>	<p>Consistent: See response to RTP/SCS Goal 6.</p>
<p>Goal 9: Maximize the security of our transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies.</p>	<p>Consistent: The City of San Juan Capistrano monitors existing and newly constructed roadways and transit routes to determine the adequacy and safety of these systems. Other local and regional agencies (e.g., Orange County Transportation Authority, Caltrans, and SCAG) work with the City to manage these systems. Security situations involving roadways and evacuations would be addressed in the County of Orange’s emergency management protocols (e.g., the Orange County Emergency Management Division’s Emergency Operations Center) developed in accordance with the state and federal mandated emergency management regulations. The proposed project would be consistent with Goal 9.</p>

Source: Compiled by LSA (December 2019).

CALGreen Code = California Green Building Standards Code

RTP/SCS = Regional Transportation Plan/Sustainable Communities Strategy

SCAG = Southern California Association of Governments

4.7.7 Level of Significance Prior to Mitigation

There would be no potentially significant impacts related to GHG emissions.

4.7.8 Regulatory Compliance Measures and Mitigation Measures

4.7.8.1 Regulatory Compliance Measures

No regulatory compliance measures are required for the proposed project.

4.7.8.2 Mitigation Measures

No mitigation is required for the proposed project.

4.7.9 Level of Significance after Mitigation

The proposed project would result in less than significant impacts with respect to GHG emissions and there would be no significant unavoidable adverse impacts of the proposed project.

4.7.10 Cumulative Impacts

As defined in Section 15130 of the *State CEQA Guidelines*, cumulative impacts are the incremental effects of an individual project when viewed in connection with the effects of past, current, and probable future projects within the cumulative impact area for GHG emissions. GHG emissions are global pollutants, and therefore, result in cumulative impacts by nature. Consequently, it is speculative to determine how an individual project's GHG emissions would impact California. As such, impacts identified under Section 4.7.6, Project Impacts, are not project-specific impacts to GCC, but are the proposed project's contribution to this cumulative impact. The impact of project-related GHG emissions would not result in a reasonably foreseeable cumulatively considerable contribution to GCC. Additionally, the proposed project, in conjunction with other cumulative projects, would be subject to all applicable regulatory requirements which would further reduce GHG emissions. Further, the proposed project would not conflict with SCAG's 2016–2040 RTP/SCS. Therefore, the project's cumulative contribution of GHG emissions would be less than significant and the project's cumulative GHG impacts would also be less than cumulatively considerable.

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