

CHAPTER 10 GREENHOUSE GASES

10.1 EXISTING SETTING

This chapter evaluates greenhouse gas (GHG) emissions that would be generated by construction and occupancy of the Alpine Sierra Subdivision (proposed project) and the potential for those GHG emissions to contribute to global climate change. GHG emissions associated with the proposed project are evaluated relative to federal, state, and local policies, regulations, and standards related to GHGs and climate change. Climate change is considered a significant cumulative impact because although most single projects would not contribute significantly to climate change, cumulative emissions from many projects could affect global GHG concentrations and the climate system.

GHG emissions estimates were prepared using the California Emissions Estimator Model (CalEEMod) 2013.2.2. The resulting technical support materials are provided in Appendix G to this Draft Environmental Impact Report (EIR).

Greenhouse Gases and Climate Change

The Earth's climate has undergone many changes during its history, ranging from ice ages to long periods of warmth. Natural factors such as volcanic eruptions, changes in the Earth's orbit, and the amount of energy from the sun have affected global temperatures and, thus, Earth's climate. "Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer)" (EPA 2013). The term "climate change" is often used interchangeably with the term "global warming"; however, "climate change" is preferred, as it helps convey that there are other changes in addition to rising temperatures.

Heat retention within the atmosphere is an essential process to sustain life on Earth. The natural process through which heat is retained in the troposphere (the lower portion of the atmosphere) is called the "greenhouse effect." The greenhouse effect traps heat in the troposphere through a threefold process: 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 long-wave (thermal) radiation emitted back toward Earth is the underlying process of the greenhouse effect. This natural process contributes to regulating Earth's temperature, without which the temperature of Earth would be about 0°F (-18°C) instead of its present 57°F (14°C) (NCDC 2012).

Gases that trap heat in the atmosphere are often called “greenhouse gases.” Principal GHGs are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone, and water vapor. Some GHGs, such as CO₂, CH₄, and N₂O, occur naturally and are emitted into the atmosphere through natural processes and human activities. Emissions of CO₂ are largely byproducts of fossil-fuel combustion, whereas CH₄ results mostly from off-gassing associated with agricultural practices and landfills. Human-caused GHGs, which are associated with certain industrial products and processes, have a much greater heat-absorption potential than CO₂. They include fluorinated gases such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃). The major GHGs emitted by human activities remain in the atmosphere for periods ranging from decades to centuries, as summarized in Table 10-1, Global Warming Potential and Atmospheric Lifetimes of Select GHGs; therefore, it is virtually certain that atmospheric concentrations of GHGs will continue to rise over the next few decades (EPA 2011). The current version of the California Emissions Estimator Model (CalEEMod) (version 2016.3.1) assumes that the GWP for CH₄ is 25 (which means that emissions of 1 MT of CH₄ are equivalent to emissions of 25 MT of CO₂), and the GWP for N₂O is 298, based on the IPCC Fourth Assessment Report (IPCC 2007). The GWP values identified in CalEEMod were applied to the project.

Table 10-1
Global Warming Potential and Atmospheric Lifetimes of Select GHGs

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)
Carbon Dioxide (CO ₂)	50–200	1
Methane (CH ₄)	12±3	28-36
Nitrous Oxide (N ₂ O)	120	265-298
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: Tetrafluoromethane (CF ₄)	50,000	6,500
PFC: Hexafluoroethane (C ₂ F ₆)	10,000	9,200
Sulfur Hexafluoride (SF ₆)	3,200	23,900

Source: EPA 2013.

In 2011, transportation generated 38% of California’s GHG emissions, followed by the industrial sector (21%), electricity generation (19%), commercial and residential (10%), agriculture and forestry (7%), and other sources (5%) (CARB 2013). Emissions of CO₂ and N₂O are byproducts of fossil fuel combustion, among other sources. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills. Sinks of CO₂ include uptake by vegetation and dissolution into the ocean.

GHGs play a critical role in Earth's radiation budget by trapping infrared radiation emitted from the Earth's surface, which could have otherwise escaped to space. This phenomenon, known as the "greenhouse effect," keeps the Earth's atmosphere near the surface warmer than it would be otherwise, and allows for successful habitation by humans and other forms of life. Prominent GHGs contributing to this process are CO₂, CH₄, N₂O, and certain refrigerants such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and HFCs.

Global warming potential (GWP) is a measure of how much a given mass of a single GHG is estimated to contribute to global warming. It is a relative scale that compares the gas in question to that of the same mass of CO₂ (whose GWP is 1). In this analysis, CH₄ is assumed to have a GWP of 21 and N₂O has a GWP of 310. Refrigerants have GWPs that range from 76 up to 12,240. Consequently, using each pollutant's GWP, emissions of CO₂, CH₄, N₂O, CFCs, HCFCs, and HFCs can be converted into a CO₂ equivalent (CO₂e) (CCAR 2009).

Fossil fuels contain carbon. Combustion of these fuels releases carbon that was previously stored underground into the active carbon cycle, thus increasing concentrations of GHGs in the atmosphere. Emissions of GHGs in excess of natural ambient concentrations enhance the greenhouse effect and contribute to what is termed "global warming," a trend of unnatural warming of the Earth's natural climate. Increases in these gases lead to more absorption of radiation and warm the lower atmosphere further, thereby increasing evaporation rates and temperatures near Earth's surface. Further, this warming is leading to other substantial changes in global climate patterns and weather conditions. Climate change is a global problem, and GHGs are global pollutants, unlike criteria pollutants (such as ozone, carbon monoxide, and particulate matter) and toxic air contaminants, which are pollutants of regional and local concern.

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and the United Nations Environment Programme. IPCC's mission is to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, including the potential impacts and options for adaptation and mitigation. IPCC predicts substantial increases in global temperatures of between 1.1°C to 6.4°C, depending on the scenario (IPCC 2013).

Climate change could affect California's natural environment in the following ways (California Energy Commission 2012):

- Rising sea levels along the California coastline, particularly in San Francisco and the Sacramento–San Joaquin River Delta due to ocean expansion.
- Extreme heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent.

- An increase in heat-related human deaths and infectious diseases, and a higher risk of respiratory problems caused by deteriorating air quality.
- Reduced snow pack and stream flow in the Sierra Nevada, affecting water supplies and winter recreation.
- Potential increase in the severity of winter storms, affecting peak stream flows and flooding.
- Changes in growing-season conditions that could affect California agriculture, causing variations in crop quality and yield.
- Changes in distribution of plant and wildlife species due to changes in temperature, competition of colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.
- Increased occurrence of drought and increased severity of drought.

Similar changes as these noted above for California would also occur in other parts of the world.

These changes in California's climate and ecosystems could occur at a time when California's population is expected to increase from 34 million to 59 million by the year 2040 (California Energy Commission 2012). If actions are not taken to reduce GHG emissions, the anticipated increase in population would also lead to increases in the amount of anthropogenic GHG emissions and the number of people potentially affected by climate change.

10.2 REGULATORY FRAMEWORK

Air quality and GHGs are monitored through the efforts of various international, federal, state, regional, and local government agencies. The agencies work jointly and individually to improve air quality through legislation, regulations, planning, policymaking, education, and a variety of programs. The agencies responsible for regulating and improving air quality in Placer County are discussed below.

10.2.1 Federal Regulations

Environmental Protection Agency

On April 2, 2007, in *Massachusetts v. U.S. Environmental Protection Agency*, the Supreme Court directed the U.S. Environmental Protection Agency (EPA) administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the EPA administrator was required to follow the language of Section 202(a) of the Clean Air Act. On December 7, 2009,

the EPA administrator signed a final rule with two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- The EPA administrator found that elevated concentrations of GHGs—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the “endangerment finding.”
- The EPA administrator further found that the combined emissions of GHGs—CO₂, CH₄, N₂O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to 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 regulating GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act

The Energy Independence and Security Act of 2007 would do the following, which would aid in the reduction of national GHG emissions:

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

Federal Vehicle Standards

In response to the U.S. Supreme Court ruling discussed above, the Bush Administration issued Executive Order 13432 in 2007 directing the EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the National Highway Traffic Safety Administration (NHTSA) issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011; and, in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, President Barack Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of CO₂ in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021, and NHTSA intends to set standards for model years 2022–2025 in a future rulemaking.

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

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

10.2.2 State Regulations

Several state-level actions have been taken to limit GHG emissions. Those actions are described below.

Executive Order S-3-05

On June 1, 2005, California Governor Arnold Schwarzenegger issued Executive Order S-3-05. It included the following GHG emissions reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80% below 1990 levels. To meet these targets, the governor directed several state agencies to cooperate in the development of a climate action plan. The secretary of the California EPA leads the Climate Action Team, whose goal is to implement emissions reduction programs identified in the climate action plan and to report on the progress made toward meeting the emissions reduction targets established in the executive order.

In adopting AB 32, the Global Warming Solutions Act of 2006, and SB 32, the Global Warming Solutions Act of 2006: emissions limit, discussed below, the Legislature did not adopt the 2050 horizon-year goal from EO S-3-05.

Assembly Bill 1493

Assembly Bill (AB) 1493 (Pavley) was enacted to address GHG emissions from the transportation sector, which accounts for more than half of California's CO₂ emissions. As required by AB 1493, the California Air Resources Board (CARB) established GHG emissions standards for model year 2009 and subsequent year passenger vehicles, light-duty trucks, and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state. The near-term (2009–2012) standards resulted in a reduction of an estimated 22% in GHG emissions compared to the emissions from the 2002 fleet; mid-term (2013–2016) standards will result in a reduction of approximately 30%.

To authorize California to implement these regulations, EPA granted California a waiver under the federal Clean Air Act, which ordinarily preempts state regulation of motor vehicle emissions standards. In addition, CARB revised the motor vehicle GHG standards to harmonize the state program with the national program for 2012–2016 model years. The revised regulations became effective on April 1, 2010.

California Global Warming Solutions Act of 2006 (Assembly Bill 32)

To further the goals established in Executive Order S-3-05, the legislature enacted AB 32 (Nuñez and Pavley), the California Global Warming Solutions Act of 2006. This bill established the target for 2020 set by the executive order—reducing GHG emissions to the 1990 levels—as a regulatory requirement. In addition, AB 32 assigned CARB the responsibility of carrying out and developing the programs and requirements necessary to achieve the goals of AB 32.

In adopting AB 32, the California legislature established a cap on statewide GHG emissions, and set forth a regulatory framework to achieve the corresponding reduction in statewide emissions levels. AB 32 regulates CO₂, CH₄, N₂O, HFCs, PFCs, and sulfur hexafluoride.

AB 32 requires that CARB do the following:

- Adopt early action measures to reduce GHGs.
- Establish a statewide GHG emissions cap for 2020 based on 1990 emissions.
- Adopt mandatory reporting rules for significant GHG sources.
- Adopt and regularly update a scoping plan indicating how emissions reductions will be achieved via regulations, market mechanisms, and other actions.
- Adopt regulations needed to achieve the maximum technologically feasible and cost-effective reductions in GHGs.

Executive Order S-1-07

Issued on January 18, 2007, Executive Order S-1-07 sets a declining Low Carbon Fuel Standard (LCFS) for GHG emissions measured in CO₂e grams 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% by 2020. 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 regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources such as algae, wood, and agricultural waste. In addition, the LCFS aims to drive the availability of plug-in hybrid, battery electric, and fuel-cell-power motor vehicles. The LCFS is anticipated to replace 20% of the fuel used in motor vehicles with alternative fuels by 2020.

California's Scoping Plan and GHG Emissions Cap

In the adopted Climate Change Scoping Plan (Scoping Plan) (CARB 2008), CARB lays out the GHG reductions that need to be achieved and the types of measures that will be used to reach them. The Scoping Plan predicts that under a no action taken (NAT) scenario, 2020 GHG emissions would equal 596 million metric tons CO₂e. Consequently, compared to the 1990 GHG emissions inventory, emissions would need to be reduced by 169 million metric tons CO₂e in 2020. This represents a 30% GHG reduction from the 1990 levels to be achieved by 2020. In 2011, CARB updated the projected GHG emissions to reflect the effects of the economic downturn, finding that a reduction of 21% from the projected NAT scenario would be necessary to achieve the statewide emissions targets. This 21% reduction assumes that the NAT scenario does not account for the effect of additional GHG regulations that have been adopted. CARB found that if using a NAT scenario that accounts for those additional regulations, specifically the increased renewable energy standard (the Renewable Portfolio Standard) and reductions in vehicle emissions (under a regulation referred to as Pavley I), a reduction from that NAT scenario of 16% would be needed to achieve the established targets.

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. Key elements of the Scoping Plan are as follows:

- Expanding and strengthening existing energy efficiency programs, and building and appliance standards.
- Achieving a statewide renewables energy mix of 33%.

- 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% 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 LCFS.
- 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 California’s long-term commitment to AB 32 implementation.

Senate Bill 375

Senate Bill (SB) 375 encourages housing and transportation planning on a regional scale, in a manner designed to reduce vehicle use and associated GHG emissions. As required under this law, CARB assigned regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035. The targets apply to the regions in the state covered by the 18 Metropolitan Planning Organizations, including the Sacramento Area Council of Governments. If Metropolitan Planning Organizations do not meet the GHG reduction targets, transportation projects will not be eligible for funding programmed after January 1, 2012. CARB adopted regional reduction targets in 2010. For the Sacramento Area Council of Governments area, the adopted reduction targets call for a 7% reduction by 2020 and a 16% reduction by 2025.

SB 375 also requires each Metropolitan Planning Organization to include a Sustainable Communities Strategy in its Regional Transportation Plan (or an Alternative Planning Strategy, if it is not feasible to adopt a Sustainable Communities Strategy that meets regional GHG reduction targets). The Sustainable Communities Strategy must set forth a vision for growth for the region while taking into account transportation, housing, environmental, and economic needs. The Sustainable Communities Strategy is the blueprint by which the region will meet its GHG emissions reductions target if there is a feasible way to do so.

Executive Order B-30-15

Executive Order (EO) B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. To facilitate achievement of this goal, EO B-30-15 calls for an update to CARB’s Scoping Plan to express the 2030 target in terms of MMT

CO₂E. The EO also calls for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets. Sector-specific agencies in transportation, energy, water, and forestry were required to prepare GHG reduction plans by September 2015, followed by a report on action taken in relation to these plans in June 2016. EO B-30-15 does not require local agencies to take any action to meet the new interim GHG reduction threshold.

SB 32 and AB 197

SB 32 and AB 197 (enacted in 2016) are companion bills that set a new statewide GHG reduction targets; make changes to CARB's membership, and increase legislative oversight of CARB's climate change-based activities; and expand dissemination of GHG and other air quality-related emissions data to enhance transparency and accountability. SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 also added two members of the Legislature to CARB as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and TACs from reporting facilities; and, requires CARB to identify specific information for GHG emissions reduction measures when updating the scoping plan.

Executive Order S-13-08

Governor Arnold Schwarzenegger issued Executive Order S-13-08 on November 14, 2008. The executive order is intended to hasten California's response to the impacts of global climate change, particularly sea level rise. It directs state agencies to take specified actions to assess and plan for such impacts, including requesting the National Academy of Sciences to prepare a Sea Level Rise Assessment Report; directing the Business, Transportation, and Housing Agency to assess the vulnerability of the state's transportation systems to sea level rise; and requiring the Office of Planning and Research and the Natural Resources Agency to provide land use planning guidance related to sea level rise and other climate change impacts.

The executive order also required state agencies to develop adaptation strategies to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years. The adaption strategies report summarizes key climate change impacts to the state for the following areas: public health, ocean and coastal resources, water supply and flood protection, agriculture, forestry, biodiversity and habitat, and transportation and energy infrastructure. The report then recommends strategies and specific responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

Executive Order S-3-05

In June 2005, Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80% below 1990 levels by 2050. The California EPA secretary is required to coordinate efforts of various agencies to collectively and efficiently reduce GHGs. The Climate Action Team is responsible for implementing global warming emissions reduction programs. Representatives from several state agencies comprise the Climate Action Team. The Climate Action Team fulfilled its report requirements through the March 2006 Climate Action Team Report to the governor and the legislature. The 2009 Climate Action Team Biennial Report, published in April 2010, expands on the policy outlined in the 2006 assessment. The 2009 report provides new information and scientific findings regarding the development of new climate and sea level projections using new information and tools that have recently become available and evaluates climate change within the context of broader social changes, such as land use changes and demographics. The 2009 report also identifies the need for additional research in several different aspects that affect climate change in order to support effective climate change strategies. The aspects of climate change determined to require future research include vehicle and fuel technologies, land use and smart growth, electricity and natural gas, energy efficiency, renewable energy and reduced carbon energy sources, low GHG technologies for other sectors, carbon sequestration, terrestrial sequestration, geologic sequestration, economic impacts and considerations, social science, and environmental justice. Subsequently, the 2010 Climate Action Team Report to Governor Schwarzenegger and the California Legislature reviews past climate action milestones including voluntary reporting programs, GHG standards for passenger vehicles, the LCFS, a statewide renewable energy standard, and the cap-and-trade program. Additionally, the 2010 report includes a cataloging of recent research and ongoing projects; mitigation and adaptation strategies identified by sector (e.g., agriculture, biodiversity, electricity, and natural gas); actions that can be taken at the regional, national, and international levels to mitigate the adverse effects of climate change; and today's outlook on future conditions.

Executive Order B-30-15

On April 29, 2015, Governor Jerry Brown issued an executive order which identified an interim GHG reduction target in support of targets previously identified under S-3-05 and AB 32. Executive Order B-30-15 set an interim target goal of reducing GHG emissions to 40% below 1990 levels by 2030 as one way to keep California on a trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in S-3-05. To facilitate achievement of this goal, B-30-15 calls for an update to CARB's Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent. The

Executive Order also calls for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets. 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. The Executive Order does not require local agencies to take any action to meet the new interim GHG reduction threshold. It is important to note that Executive Order B-30-15 was not adopted by a public agency through a public review process that requires analysis pursuant to CEQA Guidelines section 15064.4 and that it has not been subsequently validated by a statute as an official GHG reduction target of the State of California. The Executive Order itself states it is “not intended to create, and does not, create any rights or benefits, whether substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers employees, or any other person.”

Senate Bill X1 2

SB X1 2 expands the Renewable Portfolio Standard by establishing a goal of 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% 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 adds local, publicly owned electric utilities to the Renewable Portfolio Standard. The California Public Utilities Commission established the quantity of electricity products from eligible renewable energy resources to be procured by retail sellers to achieve targets of 20% by December 31, 2013; 25% by December 31, 2016; and 33% by December 31, 2020. The statute also requires that the governing boards for local, publicly owned electric utilities establish the same targets, and the governing boards are responsible for ensuring compliance with these targets. The California Public Utilities Commission is responsible for enforcement of the Renewable Portfolio Standard for retail sellers, and the California Energy Commission and CARB enforce the requirements for local, publicly owned electric utilities.

California Code of Regulations Title 17, Sections 95100–95133

On December 6, 2007, CARB approved a regulation mandating the reporting of GHG emissions from major sources, pursuant to the California Global Warming Solutions Act of 2006. Sections 95100–95133 of Title 17 of the California Code of Regulations include mandatory reporting that applies to major sources, including cement plants, refineries, and electricity generating facilities.

California Building Code

The California Building Code (CBC) contains standards that regulate the method of use, properties, performance, and types of materials used in the construction, alteration, improvement, repair, and rehabilitation of buildings and other improvements to real property. The CBC is adopted every 3 years by the Building Standards Commission. In the interim, the Building Standards Commission adopts annual updates to make necessary mid-term corrections. The CBC standards apply statewide; however, a local jurisdiction may amend a CBC standard if the jurisdiction makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

Green Building Standards

In essence, green buildings standards are indistinguishable from any other building standards. Both are contained in the CBC and regulate the construction of new buildings and improvements. The only practical distinction between the two is that the focus of traditional building standards is protecting public health and safety, and the focus of green building standards is to improve environmental performance (BSC 2011).

AB 32, which mandates reduction in GHG emissions in California to 1990 levels by 2020, increased the urgency around the adoption of green building standards. In the Scoping Plan for implementation of AB 32, CARB identified energy use as the second largest contributor to California's GHG emissions, constituting roughly 25% of all such emissions. In recommending a green building strategy as one element of the Scoping Plan, CARB estimated that green building standards would reduce GHG emissions by approximately 26 million metric tons CO₂e by 2020 (BSC 2011).

2010 Green Building Code

On January 12, 2010, the Building Standards Commission adopted the 2010 California Green Building Standards Code, otherwise known as the CALGreen Code. In addition to the new statewide mandates, CALGreen encourages local governments to adopt more stringent voluntary provisions, known as Tier 1 and Tier 2 provisions, to further reduce emissions, improve energy efficiency, and conserve natural resources. If a local government adopts one of the tiers, the provisions become mandates for all new construction within that jurisdiction. The most significant features of the 2010 CALGreen Code include the following (BSC 2011):

- 20% mandatory reduction in indoor water use, with voluntary goal standards for 30%, 35%, and 40% reductions.

- Separate indoor and outdoor water meters to measure nonresidential buildings' indoor and outdoor water use, with a requirement for moisture-sensing irrigation systems for larger landscape projects.
- Diversion of 50% of construction waste from landfills, increasing voluntarily to 65% and 75% for new homes and 80% for commercial projects.
- Mandatory periodic inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings larger than 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies.
- Mandatory use of low-pollutant-emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.

Senate Bill 1771

SB 1771, enacted in September 2000, added Chapter 6 (commencing with Section 42800) to Part 4 of Division 26 of the Health and Safety Code, and added Chapter 8.5 (commencing with Section 25730) to Division 15 of the Public Resources Code, relating to air pollution. SB 1771 specified the creation of a nonprofit organization, the California Climate Action Registry. The California Climate Action Registry helps various California entities establish GHG emissions baselines. In addition, the California Climate Action Registry enables participating entities to voluntarily record their annual GHG emissions inventories.

Governor's Office of Planning and Research

The Governor's Office of Planning and Research amended the CEQA Guidelines, effective March 18, 2010, to provide guidance to public agencies regarding the analysis and mitigation of GHG emissions and the effects of GHG emissions in CEQA documents. Guidance on determining the significance of impacts from GHG emissions is provided in the amendments, in addition to additional guidance on determining thresholds of significance. The guidance suggests a careful judgment be made by the lead agency that should make a good-faith effort based on available information to describe, calculate, or estimate the amount of GHG emissions resulting from a project. A lead agency can use a model or methodology to quantify GHG emissions from a project, or rely on a qualitative analysis or performance-based standards. When assessing the significance of impacts from GHG emissions on the environment, lead agencies can consider the extent to which the project may increase or reduce GHGs compared to the existing environmental setting; whether project emissions exceed a threshold of significance determined applicable to the project; and/or the extent to which the project complies with adopted regulations or requirements to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. When adopting thresholds of significance, a lead agency may 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.

If GHG emissions of a project are determined to be significant, feasible means of mitigating GHG emissions, such as the following, must be applied:

- Measurement of the reduction of emissions required as part of the lead agency’s decision.
- Reductions in emissions resulting from project through project features, design, or other measures.
- Off-site measures, including offsets, to mitigate a project’s emissions.
- Measures that sequester GHG gases.
- If a GHG reduction plan, ordinance, regulation, or other similar plan is adopted, mitigation may include project-by-project measures, or specific measures or policies found in the plan that reduces the cumulative effect of emissions.

10.2.3 Local Regulations

Placer County Air Pollution Control District

To evaluate the impacts of projects on global climate change, the Placer County Air Pollution Control District (PCAPCD) has established significance thresholds for GHG emissions. Thresholds used to determine significance are from the PCAPCD document *Placer County Air Pollution Control District Policy –Review of Land Use Projects under CEQA* and are shown below.

The PCAPCD document *Placer County Air Pollution Control District Policy –California Environmental Quality Act Thresholds of Significance –Justification Report* notes the following in describing how each of the thresholds should be applied.

1. Bright-line Threshold of 10,000 metric tons of CO₂e per year for the construction and operational phases of land use projects as well as the stationary source projects
2. Efficiency Matrix for the operational phase of land use development projects when emissions exceed the De Minimis Level, and
3. De Minimis Level for the operational phases of 1,100 metric tons of CO₂e per year.

GHG emissions from projects that exceed 10,000 MT CO₂e/yr would be deemed to have a cumulatively considerable contribution to global climate change. The De Minimis Level for the operational phases of 1,100 MT CO₂e/yr represents an emissions level which can be considered as less than cumulatively considerable and be excluded from the further GHG impact analysis.

Projects with GHG emissions which exceed the De Minimis Level of 1,100 MT CO₂e/yr, but less than 10,000 MT CO₂e/yr can still be found less than cumulatively considerable when the result of project related efficiency analysis would meet one of conditions in the efficiency matrix for the applicable land use setting and land use type provided.

Placer County General Plan

The Placer County General Plan Air Quality section of the Natural Resources Element provides guidance in land use and development policies for implementation by the Placer County Air Pollution Control District (APCD). The General Plan (Placer County 2013) does not include any policies specific to climate change or reduction in GHGs. However, the following General Plan policies are applicable to the proposed project:

Goal 6.F To protect and improve air quality in Placer County.

6.F.5: The County shall encourage project proponents to consult early in the planning process with the County regarding the applicability of Countywide indirect and area wide source programs and transportation control measures (TCM) programs. Project review shall also address energy-efficient building and site designs, and proper storage, use, and disposal of hazardous materials.

6.F.6: The County shall require project-level environmental review to include identification of potential air quality impacts and designation of design and other appropriate mitigation measures or offset fees to reduce impacts. The County shall dedicate staff to work with project proponents and other agencies in identifying, ensuring the implementation of, and monitoring the success of mitigation measures.

6.F.7: The County shall encourage development to be located and designed to minimize direct and indirect air pollutants.

6.F.8: The County shall submit development proposals to the PCAPCD for review and comment in compliance with CEQA prior to consideration by the appropriate decision-making body.

Alpine Meadows General Plan

The Alpine Meadows General Plan was adopted in 1968, prior to any widespread knowledge about climate change. The plan does not include any goals or polices that address GHGs or climate change.

10.3 IMPACTS

10.3.1 Methods of Analysis

The discussion below presents the methodologies used to conduct the air quality and climate change analysis, as well as to assess the significance of the impacts evaluated in this section.

Greenhouse Gas Emissions Methodology

The issue of global climate change is inherently a cumulative issue as the GHG emissions of individual projects cannot be shown to have any material effect on global climate. Thus, the proposed project's impact to climate change is addressed only as a cumulative impact.

To provide a full understanding of the proposed project's potential contribution to climate change, the project's short-term construction-related and long-term operational GHG emissions were estimated using the CalEEMod software. The model quantifies direct GHG emissions from construction and operation (including vehicle use), as well as indirect GHG emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Emissions are expressed in annual metric tons of CO₂ equivalent units of measure (i.e., MT CO₂e), based on the global warming potential of the individual pollutants. The model estimates emissions for a variety of sources, including transportation, electricity use, natural gas use, and solid waste disposal. The model estimates GHG emissions of CO₂, CH₄, and N₂O and then converts them to carbon dioxide equivalents (CO₂e) using global warming potential of 21 for CH₄ and 310 for N₂O.

The GHG emissions that would result from the proposed project and from Alternative B were estimated using the CalEEMod modeling program. The modeling reflects the anticipated operational conditions of the project site, including all residential units that would be constructed under each project alternative. Emissions from motor vehicle use were estimated based on the assumption that 75% of the homes would be second-homes or vacation homes, as indicated in the Traffic Impacts Analysis prepared for the project (Appendix E). Assumptions regarding trip lengths and frequency of long-distance trips made by vacationers arriving to and departing from the site are documented in the Alpine Sierra Trip Assumptions summary in Appendix G.

10.3.2 Significance Criteria

The analysis below evaluates potentially significant project impacts related to GHG emissions based on the following significance criteria:

- 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?

To determine the significance of the project's GHG emissions, the Placer County APCD's GHG thresholds are compared to the estimate of GHG emissions associated with the proposed project.

10.3.3 Project Impacts

Impact 10.1

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

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A Impacts

Construction of Alternative A would result in short-term GHG emissions through the use of construction equipment, off-site trucks hauling construction materials, and worker trips. Operation of Alternative A would result in GHG emissions from vehicular traffic, area sources (use of propane, landscaping), electrical generation, water supply, and solid waste generation.

Dudek prepared an analysis of GHG emissions for Alternative A using CalEEMod; the analysis and modeling output files are provided in Appendix G to this EIR. As shown in Table 10-2, Alternative A GHG Emissions, construction of Alternative A would generate between 323 and 438 metric tons of CO₂e emissions during each year of construction. As these emissions are less than the Placer County APCD threshold for GHG emissions, project construction would result in **less than significant** impacts related to GHG emissions and climate change.

As shown in Table 10-3, the CalEEMod modeling reflects an estimated 1,037 tons per year of CO₂e emissions during project operation at full build out in year 2021. This is slightly below the Placer County APCD's De Minimus threshold of 1,100 metric tons of CO₂e emissions; therefore, project operation would result in a **less than significant** impact related to GHG emissions and climate change and no mitigation measures are required.

Table 10-2
Alternative A GHG Construction Emissions

Construction Year	CO ₂ e Emissions (metric tons)
2017	323.56
2018	438.02
2019	432.45
2020	324.11

Source: Appendix G Alt A construction and operation annual

Table 10-3
Alternative A GHG Operational Emissions

Source	GHG Emissions (Tons per year)
Area Sources	50.28
Energy Demand	309.67
Mobile Sources	636.83
Offroad equipment	13.42
Stationary equipment	0.00
Waste	16.36
Water Consumption	11.18
Total Operational	1,037.74

Source: Appendix G Alt A construction and operation annual, Alt A adjusted annual VMT totals

Alternative B Impacts

The construction and operational GHG emissions from Alternative B would be similar to and slightly less than the GHG emissions from Alternative A. As shown in the CalEEMod modeling output files in Appendix G and in Table 10-4, Alternative B GHG Construction Emissions, annual GHG emissions during construction of Alternative B would range between 326 and 469 metric tons CO₂e. As this would be less than the Placer County APCD threshold of 1,100 tons, construction of Alternative B would result in **less than significant** impacts related to GHG emissions and climate change.

Operational GHG emissions for Alternative B are reflected in Table 10-5. The CalEEMod modeling reflects an estimated 961.41 tons per year of CO₂e emissions during operation of Alternative B. This is slightly lower than the annual GHG emissions under Alternative A because Alternative B would result in slight reductions in consumption of energy and water, wastewater generation and vehicle miles travelled, as indicated in the CalEEMod modeling and assumptions in Appendix G. The Alternative B GHG emissions are below the Placer County APCD threshold of 1,100 metric tons of CO₂e emissions; therefore, operation of Alternative B would result in a **less than significant** impact related to GHG emissions and climate change and no mitigation is required.

Table 10-4
Alternative B GHG Construction Emissions

Construction Year	CO ₂ E Emissions (metric tons)
2017	326.54
2018	468.74
2019	462.68
2020	346.70

Source: Appendix G Alt B construction and operation annual

Table 10-5
Alternative B GHG Operational Emissions

Source	GHG Emissions (Tons per year)
Area Sources	41.12
Energy Demand	284.93
Mobile Sources	595.34
Offroad equipment	13.42
Stationary equipment	0.00
Waste	13.36
Water Consumption	13.24
Total Operational	961.41

Source: Appendix G Alt B construction and operation annual, Alt B adjusted annual VMT totals

Mitigation Measures

No mitigation measures are required.

Impact 10.2

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

Significance and Mitigation	Alternative A	Alternative B
Significance before mitigation:	Less than significant	Less than significant
Mitigation measures:	None required	None required
Significance after mitigation:	Less than significant	Less than significant

Alternative A and Alternative B Impacts

The project site is designated for residential development under the County's Alpine Meadows General Plan and the County's zoning ordinance. Development of the project under Alternative A or Alternative B would be consistent with regional land use plans. As discussed in Impact

10.1, implementation of the project under either alternative would result in GHG emissions that would remain below the APCD's recommended threshold of 1,100 metric tons of CO₂e and the project would have a **less than significant** impact with respect to compliance with GHG reduction plans. Thus, the project would comply with applicable plans, policies, and regulations adopted for the purpose of reducing the emissions of GHGs and no mitigation would be required.

Mitigation Measures

No mitigation measures are required.

INTENTIONALLY LEFT BLANK