
GREENHOUSE GAS EMISSIONS

INTRODUCTION

This chapter discusses the potential impacts of the implementation of the proposed Project on the local and regional air quality. Residential development projects generally contribute to air quality pollutants through construction-phase emissions and dust and operational emissions including vehicle emissions.

The discussion of criteria pollutants and toxic air contaminants in this chapter is based on the Air Quality Technical Report prepared for this EIR by Illingworth & Rodkin, included in Appendix C.

SETTING

GREENHOUSE GASES

Gases that trap heat in the Earth's atmosphere are called greenhouse gases, or GHGs. These gases play a critical role in determining the Earth's surface temperature. Part of the solar radiation that would have been reflected back into space is absorbed by these gases, resulting in a warming of the atmosphere. Without natural GHGs, the Earth's surface would be about 61 degrees cooler.¹ This phenomenon is known as the greenhouse effect. However, scientists have proven that emissions from human activities such as electricity generation, vehicle emissions and even farming and forestry practices have elevated the concentration of GHGs in the atmosphere beyond naturally occurring concentrations, enhancing the greenhouse effect that contributes to the larger process of global climate change. The six primary GHGs are:

- Carbon dioxide (CO₂), emitted when solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products are burned;
- Methane (CH₄), produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, incomplete fossil fuel combustion, and water and wastewater treatment;
- Nitrous oxide (N₂O), typically generated as a result of soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning;
- Hydrofluorocarbons (HFCs), primarily used as refrigerants;
- Perfluorocarbons (PFCs), originally introduced as alternatives to ozone depleting substances and typically emitted as by-products of industrial and manufacturing processes; and
- Sulfur hexafluoride (SF₆), primarily used in electrical transmission and distribution.

¹ California Climate Action Team, Report to Governor Schwarzenegger and the California Legislature, April 2006

Though there are other contributors to global warming, these six GHGs are identified explicitly by the U.S. Environmental Protection Agency (EPA) as threatening the public health and welfare of current and future generations, and other contributors make up a relatively small portion of the overall GHGs.²

The Global Warming Potential (GWP) concept is used to compare the ability of each GHG to trap heat in the atmosphere relative to CO₂, which, after water vapor, is the most abundant GHG. CO₂ has a GWP of 1, expressed as CO₂ equivalent (CO₂e). Other GHGs, such as methane and nitrous oxide are commonly found in the atmosphere at much lower concentrations, but with higher warming potentials, having CO₂e ratings of 21 and 310, respectively. Trace gases such as chlorofluorocarbons and hydro chlorofluorocarbons, which are halocarbons that contain chlorine, have much greater warming potential. Fortunately these gases are found at much lower concentrations and many are being phased out as a result of global efforts to reduce destruction of stratospheric ozone. In the United States in 2019, CO₂ emissions account for over 80 percent of the GHG emissions, followed by methane at about 10 percent, nitrous oxide at about 7 percent, with trace GHGs making up the remainder.³

IMPLICATIONS OF CLIMATE CHANGE

According to the California Air Resources Board (CARB), some of the potential impacts in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years.⁴ Several recent studies have attempted to explore the possible negative consequences that climate change, left unchecked, could have in California.

Below is a summary of some of the potential effects reported in an array of studies that could be experienced in California as a result of global warming and climate change:

- Air Quality – Higher temperatures, conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. For other pollutants, the effects of climate change and/or weather are less well studied, and even less well understood.⁵ If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thus ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat related deaths, illnesses, and asthma attacks throughout the State.⁶

² US EPA, Overview of Greenhouse Gases, accessed at <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>

³ U.S. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2019*. April 14, 2021, Table 2-1: Recent Trends in U.S. Greenhouse Gas Emissions and Sinks.

⁴ California Air Resources Board (CARB), 2006c. Public Workshop to Discuss Establishing the 1990 Emissions Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions, Sacramento, CA. December 1.

⁵ U.S. EPA, 2007, op. cit.

⁶ California Climate Change Center (CCCC), *Our Changing Climate: Assessing the Risks to California*, CEC-500-2006-077, July 2006.

- Water Supply – Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. For example, models that predict drier conditions (i.e., parallel climate model [PCM]) suggest decreased reservoir inflows and storage and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions (i.e., HadCM2) project increased reservoir inflows and storage, and increased river flows.⁷
- Hydrology – As discussed above, climate change could potentially affect the amount of snowfall, rainfall and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes: expansion of seawater as the oceans warm, and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could also jeopardize California’s water supply. In particular, saltwater intrusion would threaten the quality and reliability of the state’s major fresh water supply that is pumped from the southern portion of the Sacramento/San Joaquin River Delta. Increased storm intensity and frequency could affect the ability of flood-control facilities (including levees) to handle storm events. Sea levels are projected to rise in the Bay up to an additional 55 inches by the end of the century as global climate change continues. Sea level rise of this magnitude would increasingly threaten California's coastal regions with more intense coastal storms, accelerated coastal erosion, threats to vital levees, and disruption of inland water systems, wetlands, and natural habitats. Residents may also be affected if wastewater treatment is compromised by inundation from rising sea levels, given that a number of treatment plants discharge to the Bay.⁸
- Agriculture – California has a \$30 billion agricultural industry that produces half the country’s fruits and vegetables. The California Climate Change Center (CCCC) notes that higher CO2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater ozone pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year that certain crops, such as wine grapes, bloom or ripen, and thus affect their quality.⁹
- Ecosystems and Wildlife – Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. In 2004, the Pew Center on Global Climate Change released a report examining the possible impacts of climate change on ecosystems and wildlife.¹⁰ The report outlines four major ways in which it is thought that climate change could affect plants and animals: (1) timing of ecological events; (2) geographic range; (3) species’ composition within communities; and (4) ecosystem processes such as carbon cycling and storage.

⁷ Brekke, L.D., et al, 2004. “Climate Change Impacts Uncertainty for Water Resources in the San Joaquin River Basin, California.” *Journal of the American Water Resources Association*. 40(2): 149–164. Malden, MA, Blackwell Synergy for AWRA.

⁸ Association of Bay Area Governments and Metropolitan Transportation Commission, *Plan Bay Area 2040*. Adopted July 18, 2013.

⁹ California Climate Change Center (CCCC), 2006, op. cit.

¹⁰ Parmesan, C. and H. Galbraith, *Observed Impacts of Global Climate Change in the U.S.*, Arlington, VA: Pew Center on Global Climate Change, November 2004.

GREENHOUSE GAS INVENTORY

As mentioned above, the primary GHG generated by human activity is CO₂. Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO₂ emissions (and thus substantial increases in atmospheric concentrations).

- U.S. Emissions: In 2019, the United States emitted about 6,558.3 million metric tons of CO₂e.¹¹
- State of California Emissions: The 2020 GHG target of 431 million metric tons of CO₂e was met in 2016 and has continued to go down since. In 2018, California emitted approximately 425 million metric tons of CO₂e, amounting to approximately 10.7 metric tons per person. Transportation was the source of 40 percent of the state's GHG emissions, followed by industrial sources at 21 percent, electricity generation at 15 percent, and all other sources making up the remaining 24 percent. Since the peak level in 2004, California's GHG emissions have generally followed a decreasing trend.¹²
- Bay Area Emissions: BAAQMD most recently updated the GHG emission inventory (based on 2015 emissions), as presented in the 2017 Clean Air Plan, with total emissions of 85 million MTCO₂e. In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of the Bay Area's GHG emissions, accounting for 41% of the Bay Area's emissions in 2015. Stationary sources were the second largest contributors of GHG emissions with about 26% of total emissions. Buildings account for about 10% of the Bay Area's GHG emissions primarily through heating and cooking activities, and energy production accounted for 14% percent. Emissions related to fugitive gasses, waste, and agriculture make up the remainder with approximately 4%, 3%, and 1% of the total Bay Area 2015 GHG emissions, respectively.¹³

REGULATORY SETTING

FEDERAL

Global Change Research Act (1990)

In 1990, Congress passed and President George H.W. Bush signed Public Law 101-606, the Global Change Research Act. The purpose of the legislation was to:

“. . . Require the establishment of a United States Global Change Research Program aimed at understanding and responding to global change, including the cumulative effects of human activities and natural processes on the environment, to promote discussions towards international protocols in global change research, and for other purposes.”

To that end, the Global Change Research Information Office was established in 1991 (it began formal operation in 1993) to serve as a clearinghouse of information. The Act requires a report to Congress every four years on the environmental, economic, health and safety consequences of climate change;

¹¹ U.S. EPA, 2000, op. cit.

¹² California Air Resources Board, California Greenhouse Gas Emissions for 2000 to 2018: Trends of Emissions and Other Indicators, 2020 Edition.

¹³ Bay Area Air Quality Management District, *Clean Air Plan 2017: Spare the Air, Cool the Climate*, Adopted April 2017.

however, the first and only one of these reports to date, the National Assessment on Climate Change, was not published until 2000. In February 2004, operational responsibility for the Global Change Research Information Office shifted to the U.S. Climate Change Science Program.

GHG Emissions pursuant to the Clean Air Act (2007)

On April 2, 2007, in *Massachusetts v. EPA*, 549 U.S. 497, the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act. The Court held that the 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, Administrator Lisa Jackson signed a final action, under Section 202(a) of the Clean Air Act, finding that six key well-mixed GHGs constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to the climate change problem.

This action was a prerequisite for implementing GHG emissions standards. Current efforts include issuing GHG emission standards for new motor vehicles, developing and implementing renewable fuel standard program regulations, proposing carbon pollution standards for new power plants, setting GHG emissions thresholds to define when permits are required for new and existing industrial facilities under the Clean Air Act, and establishing a GHG reporting program.

Energy Independence and Security Act (2007)

The Energy Independence and Security Act of 2007 were intended to move the U.S. toward greater energy independence and security. This energy bill increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022. It also tightens the Corporate Average Fuel Economy standards that regulate the average fuel economy in the vehicles produced by each major automaker.

National Fuel Efficiency Policy Standards

On May 7, 2010, the U.S. Department of Transportation and EPA jointly issued national fuel efficiency and GHG emissions standards for model year 2012-2016 passenger vehicles and light duty trucks. The National Highway Traffic Safety Administration (NHTSA) issued Corporate Average Fuel Economy (CAFE) standards for model year 2012-2016 passenger cars and light trucks under the Energy Policy and Conservation Act and Energy Independence and Security Act and EPA issued national GHG emissions standards under the federal Clean Air Act. These joint GHG and fuel economy standards represented the first phase of the national program to improve fuel economy and reduce GHG emissions from U.S. light-duty vehicles. Starting with 2012 model year vehicles, the rules require automakers to improve fleet-wide fuel economy and reduce fleet-wide GHG emissions by approximately five percent every year. When adopted, these regulations were expected to result in a 2016 fleet average of 35.5 miles per gallon (mpg), conserve about 1.8 billion barrels of oil and reduce nearly 1 billion tons of GHG emissions over the lives of the vehicles covered.

In 2012, NHTSA established final passenger car and light truck CAFE standards for model year 2017 through model year 2021. Those CAFE standards required, on an average industry fleet-wide basis for cars and trucks combined, 40.3 to 41 mpg in model year 2021. EPA's GHG standards, which were consistent with NHTSA's CAFE standards, were projected to require 163 grams/mile of CO₂ in model year 2025.

On August 28, 2014, EPA and NHTSA finalized the new national program that would reduce GHG emissions and improve fuel economy for all new cars and trucks sold in the U.S. EPA proposed the first-ever national GHG emissions standards under the Clean Air Act, and NHTSA proposed CAFE

standards under the Energy Policy and Conservation Act. This national program allows automobile manufacturers to build a single light-duty national fleet that satisfies all requirements under both federal programs and the standards of California and other states. This program is expected to increase fuel economy to the equivalent of 54.5 miles per gallon for cars and light-duty trucks by model year 2025.

In October 2016, the EPA and NHTSA, on behalf of the Department of Transportation, established rules for a comprehensive Phase 2, Heavy-Duty (HD) national program to reduce GHG emissions and fuel consumption from new on-road medium- and heavy-duty vehicles and engines. This Phase 2 program is expected to result in fuel reductions of between 71 and 83 billion gallons, and achieve GHG reductions of between 959 and 1,098 MMT, CO₂eq.¹⁴

STATE OF CALIFORNIA

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California. There are currently no state regulations in California that establish ambient air quality standards for GHGs. However, California has passed laws directing CARB to develop actions to reduce GHG emissions, and several state legislative actions related to climate change and GHG emissions have come into play in the past decade.

Recent State Regulatory Actions Related to GHG Emissions

Executive Order S-3-05 – California GHG Reduction Targets

Executive Order (EO) S-3-05 was signed by Governor Arnold Schwarzenegger in 2005 to set GHG emission reduction targets for California. The three targets established by this EO are as follows: (1) reduce California's GHG emissions to 2000 levels by 2010, (2) reduce California's GHG emissions to 1990 levels by 2020, and (3) reduce California's GHG emissions by 80 percent below 1990 levels by 2050.

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

Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, codified the State's GHG emissions target by directing CARB to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, the CARB, CEC, California Public Utilities Commission (CPUC), and Building Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05, which has a target of reducing GHG emissions 80 percent below 1990 levels.

A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State's main strategies to reduce GHGs from business-as-usual emissions projected in 2020 back down to 1990 levels. Business-as-usual (BAU) is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system.

As directed by AB 32, CARB has also approved a statewide GHG emissions limit. On December 6, 2007, CARB staff resolved an amount of 427 million metric tons (MMT) of CO₂e as the total statewide GHG 1990 emissions level and 2020 emissions limit. The limit is a cumulative statewide

¹⁴ Federal Register, Vol. 81, No. 206, Tuesday, October 25, 2016, Rules and Regulations.

limit, not a sector- or facility-specific limit. CARB updated the future 2020 BAU annual emissions forecast, due to the economic downturn, to 545 MMT of CO₂e. Two GHG emissions reduction measures currently enacted that were not previously included in the 2008 Scoping Plan baseline inventory were included, further reducing the baseline inventory to 507 MMT of CO₂e. Thus, an estimated reduction of 80 MMT of CO₂e is necessary to reduce statewide emissions to meet the AB 32 target by 2020.

Executive Order B-30-15 & Senate Bill 32 GHG Reduction Targets – 2030 GHG Reduction Target

In April 2015, Governor Brown signed EO B-30-15, which extended the goals of AB 32, setting a greenhouse gas emissions target at 40 percent of 1990 levels by 2030. On September 8, 2016, Governor Brown signed Senate Bill (SB) 32, which legislatively established the GHG reduction target of 40 percent of 1990 levels by 2030. In November 2017, CARB issued *California’s 2017 Climate Change Scoping Plan*.¹⁵ While the State is on track to exceed the AB 32 scoping plan 2020 targets, this plan is an update to reflect the enacted SB 32 reduction target.

SB 32 was passed in 2016, which codified a 2030 GHG emissions reduction target of 40 percent below 1990 levels. CARB is currently working on a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The proposed Scoping Plan Update was published on January 20, 2017 as directed by SB 32 companion legislation AB 197. The mid-term 2030 target is considered critical by CARB on the path to obtaining an even deeper GHG emissions target of 80 percent below 1990 levels by 2050, as directed in Executive Order S-3-05. The Scoping Plan outlines the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure, providing a blueprint to continue driving down GHG emissions and obtain the statewide goals.

The new Scoping Plan establishes a strategy that will reduce GHG emissions in California to meet the 2030 target (note that the AB 32 Scoping Plan only addressed 2020 targets and a long-term goal). Key features of this plan are:

- Cap and Trade program places a firm limit on 80 percent of the State’s emissions;
- Achieving a 50-percent Renewable Portfolio Standard by 2030 (currently at about 29 percent statewide);
- Increase energy efficiency in existing buildings;
- Develop fuels with an 18-percent reduction in carbon intensity;
- Develop more high-density, transit-oriented housing;
- Develop walkable and bikeable communities;
- Greatly increase the number of electric vehicles on the road and reduce oil demand in half;
- Increase zero-emissions transit so that 100 percent of new buses are zero emissions;
- Reduce freight-related emissions by transitioning to zero emissions where feasible and near-zero emissions with renewable fuels everywhere else; and
- Reduce “super pollutants” by reducing methane and hydrofluorocarbons or HFCs by 40 percent.

In the updated Scoping Plan, CARB recommends statewide targets of no more than 6 metric tons CO₂e per capita (statewide) by 2030 and no more than 2 metric tons CO₂e per capita by 2050. The statewide per capita targets account for all emissions sectors in the State, statewide population

¹⁵ California Air Resource Board, 2017. *California’s 2017 Climate Change Scoping Plan: The Strategy for Achieving California’s 2030 Greenhouse Gas Targets*. November. Web: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf

forecasts, and the statewide reductions necessary to achieve the 2030 statewide target under SB 32 and the longer-term State emissions reduction goal of 80 percent below 1990 levels by 2050.

Executive Order B-55-18 – Carbon Neutrality

In 2018, a new statewide goal was established to achieve carbon neutrality as soon as possible, but no later than 2045, and to maintain net negative emissions thereafter. CARB and other relevant state agencies are tasked with establishing sequestration targets and create policies/programs that would meet this goal.

Senate Bill 375 – California's Regional Transportation and Land Use Planning Efforts (2008)

California enacted legislation (SB 375) to expand the efforts of AB 32 by controlling indirect GHG emissions caused by urban sprawl. SB 375 provides incentives for local governments and applicants to implement new conscientiously planned growth patterns. This includes incentives for creating attractive, walkable, and sustainable communities and revitalizing existing communities. The legislation also allows applicants to bypass certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Development of more alternative transportation options that would reduce vehicle trips and miles traveled, along with traffic congestion, would be encouraged. SB 375 enhances CARB's ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035. CARB works with the metropolitan planning organizations (e.g. Association of Bay Area Governments [ABAG] and Metropolitan Transportation Commission [MTC]) to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its GHG reduction targets. A similar process is used to reduce transportation emissions of ozone precursor pollutants in the Bay Area.

Senate Bill 350 - Renewable Portfolio Standards

In September 2015, the California Legislature passed SB 350, which increases the states Renewables Portfolio Standard (RPS) for content of electrical generation from the 33 percent target for 2020 to a 50 percent renewables target by 2030.

Senate Bill 100 – Current Renewable Portfolio Standards

In September 2018, SB 100 was signed by Governor Brown to revise California's RPS program goals, furthering California's focus on using renewable energy and carbon-free power sources for its energy needs. The bill would require all California utilities to supply a specific percentage of their retail sales from renewable resources by certain target years. By December 31, 2024, 44 percent of the retails sales would need to be from renewable energy sources, by December 31, 2026 the target would be 40 percent, by December 31, 2017 the target would be 52 percent, and by December 31, 2030 the target would be 60 percent. By December 31, 2045, all California utilities would be required to supply retail electricity that is 100 percent carbon-free and sourced from eligible renewable energy resource to all California end-use customers.

State of California Building Codes

The California Green Building Standards Code (CALGreen Code) is part of the California Building Standards Code under Title 24, Part 11.¹⁶ The CALGreen Code encourages sustainable construction standards that involve planning/design, energy efficiency, water efficiency resource efficiency, and environmental quality. These green building standard codes are mandatory statewide and are

¹⁶ See: <https://www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen#:~:text=CALGreen%20is%20the%20first%2Din,to%201990%20levels%20by%202020.>

applicable to residential and non-residential developments. The most recent CALGreen Code (2019 California Building Standard Code) was effective as of January 1, 2020.

The California Building Energy Efficiency Standards (California Energy Code) is under Title 24, Part 6 and is overseen by the California Energy Commission (CEC). This code includes design requirements to conserve energy in new residential and non-residential developments, while being cost effective for homeowners. This Energy Code is enforced and verified by cities during the planning and building permit process. The current energy efficiency standards (2019 Energy Code) replaced the 2016 Energy Code as of January 1, 2020. Under the 2019 standards, single-family homes are predicted to be 53 percent more efficient than homes built under the 2016 standard due to more stringent energy-efficiency standards and mandatory installation of solar photovoltaic systems. For nonresidential developments, it is predicted that these buildings will use 30 percent less energy due to lightening upgrades.¹⁷

REGIONAL AND LOCAL

Sustainable Communities Strategy

Metropolitan Transportation Commission (MTC) is the federally recognized metropolitan planning organization for the nine county Bay Area, which includes San Mateo County and the Town of Portola Valley. Adopted July 26, 2017, by the MTC and the Association of Bay Area Governments (ABAG), Plan Bay Area 2040 includes the region's Sustainable Communities Strategy and the Regional Transportation Plan. The Sustainable Communities Strategy lays out how the region will meet GHG reduction targets set by CARB.

The Draft 2050 Plan Bay Area was under review during the drafting of this report, but not yet adopted.

Bay Area Air Quality Management District and the Clean Air Plan

The Project site falls within the San Francisco Bay Area Air Basin and therefore under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). BAAQMD provides a document titled *California Environmental Quality Act Air Quality Guidelines* (“Guidelines”), which provides guidance for consideration by lead agencies, consultants, and other parties evaluating air quality impacts in the San Francisco Bay Area Air Basin conducted pursuant to CEQA. The document includes guidance on evaluating and mitigating greenhouse gas emissions impacts. The most recent version of the Guidelines is dated May 2017. The updated CEQA Guidelines revised significance thresholds, assessment methodologies, and mitigation strategies for criteria pollutants, air toxics, odors, and greenhouse gas emissions.

In 1991, BAAQMD, together with MTC and ABAG prepared the Bay Area’s first Clean Air Plan or CAP. The CAP was developed to address compliance with the California Clean Air Act. Since 1991, there have been a few revisions to the original plan, including a total revision in 2010 and again in 2017. The current CAP, the 2017 version, includes a multi-pollutant strategy represented by 85 control strategies to simultaneously reduce emissions and ambient concentrations of ozone, fine particulate matter, toxic air contaminants, as well as greenhouse gases that contribute to climate change.¹⁸

¹⁷ See: https://www.energy.ca.gov/sites/default/files/2020-03/Title_24_2019_Building_Standards_FAQ_ada.pdf

¹⁸ Bay Area Air Quality Management District, *Clean Air Plan 2017: Spare the Air, Cool the Climate*, Adopted April 2017.

The CAP includes the Bay Area's first-ever comprehensive Regional Climate Protection Strategy (RCPS), which identifies potential rules, control measures, and strategies that the BAAQMD can pursue to reduce GHG in the Bay Area. Measures of the 2017 CAP addressing the transportation sector are in direct support of Plan Bay Area, which was prepared by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) and includes the region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan. Highlights of the 2017 Clean Air Plan control strategy include:

- **Limit Combustion:** Develop a region-wide strategy to improve fossil fuel combustion efficiency at industrial facilities, beginning with the three largest sources of industrial emissions: oil refineries, power plants, and cement plants.
- **Stop Methane Leaks:** Reduce methane emissions from landfills and oil and natural gas production and distribution.
- **Reduce Exposure to Toxics:** Reduce emissions of toxic air contaminants by adopting more stringent limits and methods for evaluating toxic risks at existing and new facilities.
- **Put a Price on Driving:** Implement pricing measures to reduce travel demand.
- **Advance Electric Vehicles:** Accelerate the widespread adoption of electric vehicles.
- **Promote Clean Fuels:** Promote the use of clean fuels and low or zero carbon technologies in trucks and heavy-duty vehicles.
- **Accelerate Low Carbon Buildings:** Expand the production of low-carbon, renewable energy by promoting on-site technologies such as rooftop solar and ground-source heat pumps.
- **Support More Energy Choices:** Support community choice energy programs throughout the Bay Area.
- **Make Buildings More Efficient:** Promote energy efficiency in both new and existing buildings.
- **Make Space and Water Heating Cleaner:** Promote the switch from natural gas to electricity for space and water heating in Bay Area buildings.

To achieve the goals of the CAP, it identifies 85 emissions control measures for implementation by BAAQMD in collaboration with local government agencies, the business community, and Bay Area residents. The control measures target the following emissions sources:

- Stationary sources (40 measures);
- Transportation (23 measures);
- Energy (2 measures);
- Buildings (4 measures);
- Agriculture (4 measures);
- Natural and working lands (3 measures);
- Waste management (4 measures);
- Water (2 measures);
- Super-GHGs (3 measures); and
- Further study (miscellaneous stationary, building, and agriculture sources) (11 measures).

Town of Portola Valley

The Town of Portola Valley developed a Sustainability Element to their General Plan in January 2009. The element is intended to help the community achieve its goal of ensuring sustainability by the reduction of GHG emissions, green building for new and existing structures, protection of water resources, protection of the natural environment, and community education and involvement. An overarching goal of reducing carbon emissions to 1990 levels by the year 2020 and to 80% below 1990 levels by the year 2050 was established with the adoption of the General Plan's Sustainability Element.¹⁹ The Sustainability Element is not a “qualified GHG Reduction Strategy” under state regulations, meaning that consistency with its goals and objectives does not replace quantification of impacts for development projects in Portola Valley.

The California Energy Commission (CEC) updates the California Building Energy Efficiency Standards every three years, in alignment with the California Code of regulations. Title 24 Parts 6 and 11 of the California Building Energy Efficiency Standards and the California Green Building Standards Code (CALGreen) address the need for regulations to improve energy efficiency and combat climate change. The 2019 CALGreen standards include substantial changes intended to increase the energy efficiency of buildings. For example, the code encourages the installation of solar and heat pump water heaters in low-rise residential buildings. The 2019 California Code went before Town Council in December 2019 for approval, with an effective date of January 1, 2020.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

The following thresholds are based on Appendix G of the CEQA Guidelines:

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

The CEQA Guidelines state that, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. The analysis in this chapter is based on the thresholds presented in the latest BAAQMD Guidelines (May 2017), as detailed under each impact discussion below.

GREENHOUSE GAS EMISSIONS AND CLIMATE ACTION PLAN CONSISTENCY

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

BAAQMD has determined that GHG emissions and global climate change represent cumulative impacts. No single project could generate enough GHG emissions to noticeably change the global average temperature, but the combination of GHG emissions from past, present, and future projects contribute substantially to the phenomenon of global climate change and its associated environmental impacts. In developing thresholds of significance for GHG emissions, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a

¹⁹ Town of Portola Valley. *Town of Portola Valley General Plan, Sustainability Element*, adopted January 26, 2009.

project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse GHG emissions impacts.²⁰

Impact GHG-1: Increased GHG Emissions. Construction and operation of the proposed Project would be additional sources of GHG emissions, primarily through consumption of fuel for transportation and energy usage on an ongoing basis. However, the GHG emissions level would be below applicable significance thresholds and would therefore be a *less-than-significant* impact.

GHG emissions associated with development of the proposed project would occur over the short-term from construction activities, consisting primarily of emissions from equipment exhaust and worker and vendor trips. There would also be long-term operational emissions associated with vehicular traffic within the project vicinity, energy and water usage, and solid waste disposal. Emissions for the proposed project are discussed below and were analyzed using the methodology recommended in the BAAQMD CEQA Air Quality Guidelines.

Significance Thresholds

For quantified emissions, the BAAQMD's CEQA Air Quality Guidelines recommended an efficiency threshold of 4.6 metric tons (MT) per capita or, if a project is too small to meet the efficiency threshold, an overall emissions threshold of 1,100 metric tons. These thresholds were developed based on meeting the 2020 GHG targets set in the scoping plan that addressed AB 32. Development of the project would occur beyond 2020, so a threshold that addresses a future target is appropriate.

Although BAAQMD has not published a quantified threshold for 2030 yet, this assessment uses a "Substantial Progress" efficiency metric of 2.8 MT CO_{2e}/year/service population and an overall emissions threshold of 660 MT CO_{2e}/year based on the GHG reduction goals of EO B-30-15. The service population metric of 2.8 is calculated for 2030 based on the 1990 inventory and the projected 2030 statewide population and employment levels.²¹ The 2030 overall emissions threshold is a 40 percent reduction of the 2020 1,100 MT CO_{2e}/year threshold.

A project would need to exceed both the efficiency and overall emissions thresholds to be considered to have a significant impact with respect to GHG emissions.

Emissions Qualification and Conclusions

CalEEMod was used to predict GHG emissions from operation of the site assuming full build-out of the project. The project land use types and size and other project-specific information were input to the model, as discussed in more detail in Attachment C.

During construction of the project, greenhouse gases would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically uses fossil-based fuels to operate. BAAQMD does not have an adopted threshold of significance for construction-related GHG emissions. Per standard procedures for analysis, quantification of construction has been annualized over the average lifetime of a building (40 years) and assessed with the operational analysis below.

²⁰ Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, May 2017, p. 2-1.

²¹ Association of Environmental Professionals, 2016. *Beyond 2020 and Newhall: A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California*. April.

Operationally, greenhouse gases would be emitted through building operation including use of landscaping equipment (area) and the distribution, consumption, and/or disposal of energy, water, and waste as well as emission from vehicles traveling to and from the site (mobile), as detailed in **Table 10.1** below.

Table 10.1: Annual Project GHG Emissions

Emission Sources	MTCO₂e/yr
Construction (annualized over 40 years)	12
Area	3
Energy	103
Mobile	236
Water and Waste	22
Total	376
<i>Overall Emissions CEQA Threshold (2030)</i>	<i>660</i>
Per Capita¹ Emissions (MT CO₂e/year/per capita)	3.6
<i>Efficiency CEQA Threshold (2030)</i>	<i>2.8</i>
<i>Exceed Both Thresholds?</i>	<i>No</i>
¹ Based on a population of 101 residents calculated using the Town of Portola Valley's average 2.58 persons per household for the 39 units. See discussion of population and housing in Chapter 17 of this EIR for additional information. Source: CalEEMod, see Appendix C.	

To be considered an exceedance of significance thresholds, the project must exceed both the GHG overall emissions threshold and the efficiency threshold, as they are intended to capture small or large projects respectively. If it can be demonstrated that a project is below one of the thresholds, then that project does not exceed both thresholds and would not have a significant impact.

As shown in Table 10.1, the Project would not exceed the 660 MT CO₂e/year overall emissions threshold in 2030 and therefore is below significance levels as a small project with low levels of emissions and the Project's impact with respect to GHG emissions would be ***less than significant***.

CONSISTENCY WITH GHG REDUCTION PLANS

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

CEQA Guidelines section 15183.5 permits public agencies to use local GHG reduction plans to analyze impacts under this threshold provided the local reduction plan meets special requirements, including a quantification of existing and projected local GHG emissions, performance standards designed to reduce those emissions and adoption at a public hearing following environmental review. The Project is not located in a community with an adopted qualified GHG Reduction Strategy, so consistency with such a plan cannot be analyzed. Emissions associated with the development of the proposed Project were analyzed per the 2017 BAAQMD CEQA Air Quality Guidelines. BAAQMD's thresholds and methodologies take into account implementation of state-wide regulations and plans, such as the AB 32 Scoping Plan and adopted state regulations such as Pavley and the low carbon fuel

standard. (See the Air Quality section for a related analysis of the Project's consistency with the Clean Air Plan.)

Additionally, the Town requires new development to complete a Build It Green checklist as part of its Green Building Ordinance. Build It Green is a nonprofit organization focused on reducing carbon emissions by connecting more homes to clean power and advanced energy technologies. Their checklists are used to estimate a *GreenPoint* Rating score, which the Town uses to assess if a new development project meets the requirements of the Town's Green Building Ordinance. The applicant has completed the checklist and identified 173 points, including but not limited to points for roof-top solar panels, electric vehicle charging stations, energy efficient appliances and lighting, water efficient appliances and fixtures, construction-period waste diversion, environmentally-friendly building materials and finishes, and resource-efficient landscaping. A minimum of 75 points are required per the Town's Green Building Ordinance. Therefore, the Project meets and exceeds minimum requirements for sustainability under Town's requirements.

Therefore, the Project is consistent with relevant plans, policies, and regulations related to GHG emissions and there would be *no impact* in this regard.