3.5 Greenhouse Gas Emissions

This section describes the affected environment and regulatory setting for greenhouse gas (GHG) emissions and climate change. It also describes the impacts on GHG emissions and climate change that would result from implementation of the project and mitigation measures for significant impacts where feasible and appropriate.

Climate change is the cumulative effect of all natural and anthropogenic sources of GHGs on a global scale. The GHG emissions from an individual project, even a very large development project, would not individually generate sufficient GHG emissions to measurably influence global climate change. Consideration of a project's climate change impact, therefore, is essentially an analysis of a project's contribution to a cumulatively significant global impact through its emission of GHGs. While it is possible to examine the quantity of GHGs that would be emitted from individual project sources, it is not currently possible to link these GHGs emitted from a specific source or location to particular global climate changes.

Although environmental impacts associated with climate change cannot be directly linked to individual development projects, the State of California recognizes the link between development activities and GHG emissions and is in the process of developing standards for assessment and, ultimately, regulation of the GHG emissions associated with land use. The State of California, through Assembly Bill (AB) 32 and Executive Order S-3-05, has set statewide targets for the reduction of GHG emissions. The goal of AB 32 and Executive Order S-3-05 is to reduce future California GHG emissions in a state that is expected to experience rapid growth in population and economic output. While the California Environmental Quality Act (CEQA) focuses on reducing emissions associated with new development, other regulatory means will need to be implemented to reduce existing emissions.

Additional information on GHG emissions and the technical data used to prepare this section is provided in Appendix 3.4.

Issues identified in response to the Notice of Preparation (NOP) (Appendix 1) were considered in preparing this analysis. One comment pertaining to climate change was identified during the scoping meeting; this comment expressed concern over the impacts of the heat island effect related to the open asphalt parking lot planned for the Project.

Existing Conditions

Regulatory Setting

Federal

Although climate change and GHG reduction is a concern at the federal level, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. However, recent activity suggests that regulation may be forthcoming. Foremost among recent developments have been the U.S. Supreme Court's decision in *Massachusetts v. EPA*, the "Endangerment Finding," and the "Cause or Contribute Finding," which are described below. Despite these findings, the future of GHG regulations at the federal level is still uncertain.

In 2007, 12 states and cities, including California, in conjunction with several environmental organizations, sued the U.S. Environmental Protection Agency (EPA) to regulate GHGs as a pollutant, pursuant to the federal Clean Air Act (CAA). The court ruled that the plaintiffs had standing to sue, finding that GHGs fit within the CAA's definition of a pollutant and EPA's reasons for not regulating GHGs were insufficiently grounded. For the "Endangerment Finding", on December 7, 2009, the EPA administrator found that current and projected concentrations of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorinated carbons (PFCs), and sulfur hexafluoride (SF_6) threaten the public health and welfare of current and future generations. Additionally, the administrator found that combined emissions of CO_2, CH_4, N_2O, and HFCs from motor vehicles contribute to atmospheric concentrations and thus to the threat of climate change. Although the endangerment finding in itself does not place requirements on industry, it was an important step in EPA's process to develop GHG regulation.

President's Council on Environmental Quality Draft Guidance (2010). On February 18, 2010, Nancy Sutley, chair of the Council on Environmental Quality (CEQ), issued a memorandum providing guidance regarding consideration of the effects of climate change and GHG emissions under the National Environmental Policy Act (NEPA). The draft guidance suggests that the effects of projects directly emitting GHGs in excess of 25,000 metric tons of CO_2 equivalent (CO_2e) annually be considered in a qualitative and quantitative manner. CEQ does not propose this reference as a threshold for determining significance but as "a minimum standard for reporting emissions under the CAA." The draft guidance also recommends that the cumulative effects of climate change on a proposed project be evaluated. The draft guidance is still undergoing public comments and will not be effective until issued in final form.[1]

Corporate Average Fuel Economy Standards (2010/12). The current Corporate Average Fuel Economy (CAFE) standards, which went into effect in 2012 for vehicles, incorporate stricter fuel economy standards equivalent to those previously promulgated by the State of California (see Assembly Bill 1493 discussion below) into one uniform federal standard. The changes are expected to reduce GHG emissions from new vehicles by roughly 25 percent, relative to business-as-usual (BAU), by 2016.

In October 2012, EPA and the National Highway Traffic Safety Administration (NHSTA) established the final rule for fleet-wide passenger car and light truck model year 2017 to 2025. The new CAFE standards aim to reach an emission rating of 163 grams of CO_2 per mile, or the equivalent of 54.5 miles per gallon (mpg), by model year 2025. Fleet wide fuel economy standards will become more stringent with each subsequent model year through 2025. Due to a statutory requirement that NHSTA set average fuel economy standards five model years at a time, NHSTA requires that model years 2017 to 2022 have an industry fleet wide average of 40.3 to 41.0 mpg, and estimates 2025 model year vehicles will range from 48.7 to 49.7 mpg.[2]

[1] Council on Environmental Quality. 2010. Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions. Memorandum for Heads of Federal Departments and Agencies. February 18. Available: <http://ceq.hss.doe.gov/nepa/regs/Consideration_of_Effects_of_GHG_Draft_NEPA_Guidance_FINAL_02182010.pdf>. Accessed: April 5, 2013.

[2] U.S. Environmental Protection Agency. 2012. Federal Register. Vol. 77. No. 199. October 15, 2012. Rules and Regulations: 62627. Available: <http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/2017-25_CAFE_Final_Rule.pdf>. Accessed: October 2013.

State

With the passage of several pieces of legislation, including state senate and assembly bills and executive orders, California launched an innovative and proactive approach for addressing GHG emissions and climate change at the state level.

Executive Order S-3-05. The goal of this executive order is to reduce California's GHG emissions to (1) 2000 levels by 2010, (2) 1990 levels by 2020, and (3) 80 percent below the 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill (AB) 32.

Assembly Bill 32. The Global Warming Solutions Act of 2006 sets the same overall GHG emissions reduction goals outlined in Executive Order S-3-05 while further mandating that the California Air Resources Board (ARB) create a plan that includes market mechanisms and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

Executive Order S-01-07. Governor Schwarzenegger set forth the low-carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Senate Bill (SB) 97. Senate Bill (SB) 97 required the Governor's Office of Planning and Research (OPR) to develop amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Assembly Bill 1493—Pavley Rules (2002, Amendments 2009)/Advanced Clean Cars (2011). Known as "Pavley I," the AB 1493 standards were the nation's first GHG standards for automobiles. AB 1493 required ARB to adopt vehicle standards that would lower GHG emissions from new light-duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (referred to previously as "Pavley II," now referred to as the "Advanced Clear Cars" measure) has been proposed for vehicles built during model years 2017 through 2020. Together, the two standards are expected to increase average fuel economy to roughly 43 mpg by 2020 and reduce GHG emissions from the transportation sector in California by approximately 14 percent. In June 2009, EPA granted California's waiver request, enabling the state to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

EPA and CARB are currently working together on a joint rulemaking effort to establish GHG emissions standards for passenger vehicles built during the 2017 to 2025 model years. The Interim Joint Technical Assessment Report evaluated four potential future standards that ranged from 47 to 62 mpg by 2025.[3] The official proposal was released by both EPA and ARB on December 7, 2011, and unanimously approved by ARB on January 26, 2012.[4]

Renewable Energy Standard/Renewable Portfolio Standard (2002/2006/2011). SB 1078 (2002) and SB 107 (2006) created the Renewable Energy Standard (RES) program, which required electric

[3] U.S. Environmental Protection Agency. et. al. 2010. Interim Joint Technical Assessment Report: Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2017-2025. Available:< http://www.epa.gov/oms/climate/regulations/ldv-ghg-tar.pdf>. Accessed: February 20, 2013.

[4] California Air Resources Board. 2012. News Release - California Air Resources Board Approves Advanced Clean Car Rules. Release # 12-05. January 27, 2012. Available: <http://www.arb.ca.gov/newsrel/newsrelease.php?id=282>. Accessed: October 2013.

companies to increase their procurement of eligible renewable energy resources by at least 1 percent of their retail sales annually, until reaching 20 percent by 2010. SB 2X 1 (2011) required a Renewable Portfolio Standard (RPS, functionally the same thing as the RES) of 33 percent by 2020.

Building Energy Efficiency Standards (CCR Title 24). Building energy consumption is regulated under Title 24 of the CCR. The efficiency standards contained in this title apply to new construction, both residential and non-residential buildings, and regulate energy consumed for heating, cooling, ventilation, water, and lighting. The current Building Energy Efficiency Standards were adopted in 2008 and effective January 1, 2010. California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2013 Standards will continue to improve upon the current 2008 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2013 Standards will go into effect on July 1, 2014. The Project would adhere to the 2013 Standards. The analysis presented in this evaluation is based on the 2010 building standards.

State CEQA Guidelines (2013). The 2013 State CEQA Guidelines carryover Section 15064.4 that specifically addresses the significance of GHG emissions. Section 15064.4 calls for a good-faith effort to describe, calculate, or estimate GHG emissions. It further states that the significance of GHG impacts should include consideration of the extent to which the project would increase or reduce GHG emissions, exceed a locally applicable threshold of significance, and comply with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. The revisions also state that a project may be found to have a less-than-significant impact if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (Section 15064(h)(3)). However, the revised guidelines do not require or recommend a specific analysis methodology or provide quantitative criteria for determining the significance of GHG emissions.

Cap and Trade. The development of a cap-and-trade program was included as a key reduction measure of the ARB's AB 32 Climate Change Scoping Plan.[5] The cap and trade emissions trading program developed by ARB took effect on January 1, 2012, with enforceable compliance obligations beginning January 1, 2013. The cap and trade program aims to regulate the GHG emissions from the largest producers in the state by setting a statewide firm limit, or *cap*, on the allowable annual GHGs. The cap contains three compliance phases. In compliance period one, large emitters from the electricity and industrial sector come under the cap. In the second period, which commences in 2015, fuels will be subject to the cap. Compliance phase three includes all three sectors (electricity, industry, fuels) and runs until 2020.

Each sector receives GHG trading allowances in a different way. Electricity receives allowances from ARB through a blend of auctions and free allocations based on emissions. Industry, by contrast, receives allowances based on their efficiency relative to other capped companies in their sector (benchmarks). The cap, or amount capped entities are able to emit, will decrease over time (approximately 2 to 3 percent each year. Capped entities with more allowances than emissions may bank some allowances to cover future emissions or sell those allowances back to the market established under the program. Capped entities with emissions that exceed their allowances must purchase more allowances in order to comply with the program.

ARB administered the first auction on November 14, 2012, with many of the qualified bidders representing corporations or organizations that produce large amounts of GHG emissions, including

[5] California Air Resources Board. 2012. Cap-and-Trade Regulation Instructional Guidance. Chapter 1: How does the Cap-and-Trade Program Work? September 2012. Available: <http://www.arb.ca.gov/cc/capandtrade/guidance/chapter1.pdf>. Accessed: October 2013.

energy companies, agriculture and food industries, steel mills, cement companies, and universities.[6] It is anticipated that the program will cover around 350 to 400 businesses or *capped entities*, including those headquartered out of state if they operate facilities in California.

On November 13, 2012, the California Chamber of Commerce filed a lawsuit that claims the cap-and-trade "auction is not a 'fee schedule' authorized by AB 32," and that the auction of allowances is the equivalent of a tax, which would require an act of the California legislature. By most accounts, the claims are not expected to prevail because ARB under the Scoping Plan took great care to contrast cap-and-trade from a fee.

Local

Bay Area Air Quality Management District. Bay Area Air Quality Management District (BAAQMD) is the primary agency responsible for comprehensive air pollution control in the entire San Francisco Bay Area Air Basin (SFBAAB), including the City of Menlo Park (City). To that end, BAAQMD, a regional agency, works directly with the Association of Bay Area Governments (ABAG), the Metropolitan Transportation Commission (MTC), and local governments. On June 1, 2005, the BAAQMD Board of Directors adopted a resolution establishing a Climate Protection Program and acknowledging the link between climate protection and programs to reduce air pollution in the San Francisco Bay Area (Bay Area). A central element of BAAQMD's climate protection program is the integration of climate protection activities into existing BAAQMD programs. BAAQMD's climate protection program emphasizes collaboration with ongoing climate protection efforts at the local and state level, public education and outreach and technical assistance to cities and counties.

Although BAAQMD is responsible for regional climate change planning efforts, it does not have the authority to directly regulate the GHG emission issues associated with local plans and new development projects within the Bay Area. Instead, BAAQMD has used its expertise and prepared the BAAQMD CEQA Guidelines to indirectly address these issues. The purpose of the BAAQMD CEQA Guidelines is to assist lead agencies, as well as consultants, project proponents, and other interested parties, in evaluating potential air quality impacts of projects and plans proposed in the Bay Area. Specifically, the BAAQMD CEQA Guidelines explain the procedures that BAAQMD recommends be followed during the environmental review processes required by CEQA. The BAAQMD CEQA Guidelines provide direction on how to evaluate potential GHGs impacts, how to determine whether these impacts are significant, and how to mitigate these impacts.

BAAQMD recently updated its CEQA Guidelines and adopted revised CEQA significance thresholds on June 2, 2010.[7] The BAAQMD CEQA Guidelines were the subject of legal action claiming that BAAQMD needed to comply with CEQA prior to adopting its 2010 CEQA Guidelines and significance thresholds. On appeal, the appellate court ruled that adoption of guidelines and thresholds is not considered a project subject to CEQA review, and adoption of the significance thresholds was not arbitrary and capricious. As of the time of writing in February 2014, BAAQMD has yet to formally re-recommend its CEQA Guidelines and significance thresholds for use by local agencies, but has indicated a lead agency has the discretion to determine the appropriate thresholds of significance based on substantial evidence in the record.

[6] California Air Resources Board. 2012. California Air Resources Board Quarterly Auction 1. November 2012. Available: <http://www.arb.ca.gov/cc/capandtrade/auction/november_2012/auction1_results_2012q4nov.pdf>. Accessed: October 2013.

[7] Bay Area Air Quality Management District. 2010. Draft CEQA Air Quality Guidelines. May. Available: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx. Accessed: October 2013.

Given the appellate court ruling and the substantial evidence supporting the thresholds, BAAQMD is expected to recommend its CEQA Guidelines and thresholds at any time; therefore, the BAAQMD CEQA Guidelines and thresholds are utilized in this Draft EIR.

BAAQMD CEQA Guidelines encourage local governments to adopt a qualified GHG Reduction Strategy that is consistent with AB 32 goals. The qualified GHG reduction plan should identify goals, policies, and implementation measures that would achieve AB 32 goals for the entire community. Plans with horizon years beyond 2020 should consider continuing the downward reduction path set by AB 32 and move toward climate stabilization goals established in Executive Order S-3-05. The BAAQMD CEQA Guidelines describe a qualified GHG reduction plan adopted by a local jurisdiction as including the following elements.

- A GHG inventory for current year and forecast for 2020 (and for 1990 if the reduction goal is based on 1990 emission levels).
- An adopted GHG reduction goal for 2020 for the jurisdiction from all sources (existing and future) which is consistent with AB 32 goals and the AB 32 Scoping Plan.
- Identified feasible reduction measures to reduce GHG emissions for 2020 to the identified target, including application of relevant reduction measures in the AB 32 Scoping Plan that are within the jurisdiction of the local land use authority (such as building energy efficiency, etc.).
- A quantification of the reduction effectiveness of each of the feasible measures identified, including disclosure of calculation method and assumptions.
- Identified implementation steps and financing mechanisms to achieve the identified goal by 2020.
- Procedures for monitoring and updating the GHG inventory and reduction measures at least twice before 2020 or at least every 5 years.
- Identified responsible parties for implementation and a schedule for implementation.
- A certified CEQA document or equivalent.

Neither the City nor San Mateo County has a qualified GHG reduction strategy as defined in the BAAQMD CEQA Guidelines. The City's Climate Action Plan (CAP), described in more detail below, does not include all the required elements. Therefore, it is not a qualified GHG reduction strategy as defined by BAAQMD CEQA Guidelines.

Menlo Park Climate Action Plan. The City's Climate Action Plan (CAP) (adopted in May 2009)[8] proposes local emissions reduction strategies designed to help meet AB 32 targets. The CAP provides the emission inventory from 2005-2009, the emission forecast for year 2020, a reduction goal for 2020, and the recommendation for GHG reduction strategies. The City subsequently prepared the CAP Assessment Report in July 2011. This report clarified and updated the CAP and is now the primary strategy for the City to reduce GHG emissions. Based on the emission inventory and forecast for year 2020, and in order to meet AB 32 goals, the City adopted a GHG reduction target of 27 percent below the 2005 level by 2020 in June 2013.

The CAP Assessment Report recommends various community and municipal strategies for near-term and mid-term considerations. The emissions reduction strategies are generally focused on community

[8] City of Menlo Park. 2009. Climate Change Action Plan. Available: http://www.menlopark.org/departments/env/CAP2009Complete.pdf. Accessed: October 2013.

actions, since more than 99 percent of the emissions are from community sources. A cost benefit analysis of the selected strategies will be presented to City Council prior to implementation.

Menlo Park General Plan. The General Plan guides development and use of land within the City. Several goals and policies of the Land Use and Circulation Element of the General Plan apply broadly to GHG emissions, as follows.

> ***Goal I-G:*** To promote the preservation of open-space lands for recreation, protection of natural resources, the production of managed resources, protection of health and safety, and/or the enhancement of scenic qualities.
>
> *Policy I-H-2:* The use of water-conserving plumbing fixtures in all new public and private development shall be required.
>
> *Policy I-H-3:* Plant material selection and landscape and irrigation design for City parks and other public facilities and in private developments shall adhere to the City's Water Efficient Landscape Ordinance.
>
> *Policy I-H-7:* The use of reclaimed water for landscaping and any other feasible uses shall be encouraged.
>
> *Policy I-H-12:* Street orientation, placement of buildings, and use of shading should contribute to the energy efficiency of the community.
>
> *Policy II-A-12:* The City shall endeavor to provide for the safe, efficient, and equitable use of streets by pedestrians and bicyclists through good roadway design, maintenance, and effective traffic law enforcement.
>
> ***Goal II-B:*** To promote the use of public transportation.
>
> *Policy II-B-1:* The City shall consider transit modes in the design of transportation improvements and the review and approval of development projects.
>
> *Policy II-B-3:* The City shall promote improved public transit service and increased transit ridership, especially to office and industrial areas and schools.
>
> ***Goal II-C:*** To promote the use of alternatives to the single occupant automobile.
>
> *Policy II-C-1:* The City shall work with all Menlo Park employers to encourage employees to use alternatives to the single occupancy automobile in their commute to work.
>
> ***Goal II-D:*** To promote the safe use of bicycles as a commute alternative and for recreation.
>
> *Policy II-D-3:* The design of streets within Menlo Park shall consider the impact of street cross section, intersection geometrics, and traffic control devices on bicyclists.
>
> *Policy II-D-4:* The City shall require new commercial and industrial development to provide secure bicycle storage facilities on-site.

The following policies from the Open Space and Conservation Element of the City's General Plan pertain to the Project.

> ***Goal OSC4:*** Promote Sustainability and Climate Action Planning.
>
> *Policy OSC4.1:* Sustainable Approach to Land Use Planning to Reduce Resource Consumption. Encourage, to the extent feasible, (1) a balance and match between jobs and housing, (2) higher density residential and mixed-use development to be located adjacent to commercial centers and transit corridors, and (3) retail and office areas to be located within walking and biking distance of transit or existing and proposed residential developments.
>
> *Policy OSC4.2:* Sustainable Building. Promote and/or establish environmentally sustainable building practices or standards in new development that would conserve water and energy, prevent

stormwater pollution, reduce landfilled waste, and reduce fossil fuel consumption from transportation and energy activities.

Policy OCS4.3: Renewable Energy. Promote the installation of renewable energy technology, such as, on residences and businesses through education, social marketing methods, establishing standards, and/or provide incentives.

*Policy OCS4.*4: Vehicles Using Alternative Fuel. Explore the potential for installing infrastructure for vehicles that use alternative fuel, such as electric plug in recharging stations.

Policy OCS4.5: Energy Standards in Residential and Commercial Construction. Encourage projects to achieve a high level of energy conservation exceeding standards set forth in the California Energy Code for Residential and Commercial development.

Policy OCS4.6: Waste Reduction Target. Strive to meet the California State Integrated Waste Management Board per person target of waste generation per person per day through their source reduction, reuse, and recycling programs.

Policy OCS4.7: Waste Management Collaboration. Continue to support and participate in efforts such as the South Bayside Waste Management Authority, which provides waste reduction, recycling, and solid waste programs and solutions.

Policy OCS4.8: Waste Diversion. Develop and implement a zero waste policy, or implement standards, incentives, or other program that would lead the community towards a zero waste goal.

Policy OCS4.10: Energy Upgrade California. Consider actively marketing and providing additional incentives for residents and businesses to participate in local, state, and/or federal renewable or energy conservation programs.

Environmental Setting

Overview of Climate Change

Global climate change refers to changes in the normal[9] weather of the earth measured by alterations in wind patterns, storms, precipitation, and temperature relative to historical averages. Such changes vary considerably by geographic location. Over time, the earth's climate has undergone periodic ice ages and warming periods, as observed in fossil isotopes, ice core samples, and through other measurement techniques. Recent climate change studies use the historical record to predict future climate variations and the level of fluctuation that might be considered statistically normal given historical trends.

Temperature records from the Industrial Age (ranging from the late eighteenth century to the present) deviate from normal predictions in both rate and magnitude. Most modern climatologists predict an unprecedented warming period during the next century and beyond, a trend that is increasingly attributed to human-generated GHG emissions resulting from the industrial processes, transportation, solid waste generation, and land use patterns of the twentieth and twenty-first centuries. According to the Intergovernmental Panel on Climate Change (IPCC), GHG emissions associated with human activities have grown since pre-industrial times, increasing by 70 percent between 1970 and 2004.[10] Increased GHG emissions are largely the result of increasing fuel consumption, particularly the incineration of fossil fuels.

[9] "Normal" weather patterns include statistically normal variations within a specified range.

[10] Intergovernmental Panel on Climate Change. 2007. Summary for Policy Makers. In B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer, (eds.), Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007. Cambridge, U.K. and New York, NY, USA: Cambridge University Press. Page 3. Available: <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-spm.pdf>. Accessed: June 12, 2013.

The IPCC modeled several possible emissions trajectories to determine what level of reductions would be needed worldwide to stabilize global temperatures and minimize climate change impacts. Regardless of the analytic methodology used, global average temperature and sea level were predicted to rise under all scenarios.[11] In other words, there is evidence that emissions reductions can minimize climate change effects but cannot reverse them entirely. However, emissions reductions can reduce the severity of impacts. For example, the IPCC predicted that the range of global mean temperature change from year 1990 to 2100, given different emissions-reduction scenarios, could range from 1.1°C to 6.4°C.

Principal Greenhouse Gases

The primary GHGs generated by the Project would be carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and sulfur hexafluoride (SF_6). Note that PFCs and HFCs are not discussed as these gases are primarily generated by industrial processes, which are not anticipated as part of the Project.

To simplify reporting and analysis, methods have been set forth to describe emissions of GHGs in terms of a single gas. The most commonly accepted method to compare GHG emissions is the global warming potential (GWP) methodology defined in the IPCC reference documents.[12] The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2 equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2 (by definition, CO_2 has a global warming potential of 1).

Table 3.5-1 lists the global warming potential of CO_2, CH_4, N_2O, and SF_6, their lifetimes, and their concentrations in the atmosphere. Each of these gases is briefly described below.

Table 3.5-1. Lifetimes and Global Warming Potentials of Principal Greenhouse Gases

Greenhouse Gases	Global Warming Potential (over 100 years)	Lifetime (years)	Recent Atmospheric Concentration
CO_2	1	50–200	393 ppm
CH_4	21	9–15	1,874 ppb
N_2O	310	120	324 ppb
SF_6	23,900	3,200	7.5 ppt

Source:
Intergovernmental Panel on Climate Change. 1996. 1995: Science of Climate Change. (Second Assessment Report). Cambridge, U.K.: Cambridge University Press. 2001:388–390. Carbon Dioxide Information Analysis Center 2013.[13]

Notes:
ppb = parts per billion by volume.
ppm = parts per million by volume.
ppt = parts per trillion by volume.

[11] Intergovernmental Panel on Climate Change. 2007. Summary for Policy Makers. In Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Page 13. Available: <http://www.bcdc.ca.gov/planning/climate_change/maps/16_55/cbay_south.pdf>. Accessed: June 12, 2013.

[12] Intergovernmental Panel on Climate Change. 1996. 1995: Science of Climate Change. (Second Assessment Report). Cambridge, U.K.: Cambridge University Press. 2001: 241-280.

[13] Carbon Dioxide Information Analysis Center. 2013. *Recent Greenhouse Gas Concentrations*. Last Revised: February 2013. Available: <http://cdiac.ornl.gov/pns/current_ghg.html>. Accessed: December 17, 2013.

Carbon Dioxide. CO_2 is the most important anthropogenic GHG and accounts for more than 75 percent of all GHG emissions caused by humans. Its atmospheric lifetime of 50 to 200 years ensures that atmospheric concentrations of CO_2 will remain elevated for decades even after mitigation efforts to reduce GHG concentrations are promulgated.[14] The primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon). CO_2 can also be removed from the atmosphere by photosynthetic organisms. Atmospheric CO_2 has increased from a pre-industrial concentration of 280 parts per million (ppm) to 393 ppm.[15,16]

Methane. CH_4, the main component of natural gas, is the second most abundant GHG and has a GWP of 21.[17] Sources of anthropogenic emissions of CH_4 include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal.[18] Certain land uses also function as a both a source and sink for CH_4. For example, wetlands are a terrestrial source of CH_4, whereas undisturbed, aerobic soils act as a CH_4 sink (i.e., they remove CH_4 from the atmosphere).

Atmospheric CH_4 has increased from a pre-industrial concentration of 715 parts per billion (ppb) to 1,874 ppb.[19,20]

Nitrous Oxide. N_2O is a powerful GHG, with a GWP of 310.[21] Anthropogenic sources of N_2O include agricultural processes (e.g., fertilizer application), nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions. N_2O also is used in rocket engines, racecars, and as an aerosol spray propellant. Natural processes, such as nitrification and denitrification, can also produce N_2O, which can be released to the atmosphere by diffusion. In the United States, more than 70 percent of N_2O emissions are related to agricultural soil management practices, particularly fertilizer application.

[14] Intergovernmental Panel on Climate Change. 2007. Introduction. In B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer, (eds.), Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007. Cambridge, U.K. and New York, NY, USA: Cambridge University Press. Available: <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter1.pdf>. Accessed: April 5, 2013.

[15] Carbon Dioxide Information Analysis Center. 2013. *Recent Greenhouse Gas Concentrations*. Last Revised: February 2013. Available: <http://cdiac.ornl.gov/pns/current_ghg.html>. Accessed: December 17, 2013.

[16] Intergovernmental Panel on Climate Change. 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). Available: <http://www.ipcc.ch/ipccreports/ar4-wg1.htm>. Accessed: April 5, 2013.

[17] Intergovernmental Panel on Climate Change. 1996. 1995: Science of Climate Change. (Second Assessment Report). Cambridge, U.K.: Cambridge University Press.

[18] National Oceanic and Atmospheric Administration. 2013. Greenhouse Gases. Available: <http://www.ncdc.noaa.gov/cmb-faq/greenhouse-gases.php>. Accessed: October 2013.

[19] Carbon Dioxide Information Analysis Center. 2013. *Recent Greenhouse Gas Concentrations*. Last Revised: February 2013. Available: <http://cdiac.ornl.gov/pns/current_ghg.html>. Accessed: December 17, 2013.

[20] Intergovernmental Panel on Climate Change. 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). Available: <http://www.ipcc.ch/ipccreports/ar4-wg1.htm>. Accessed: April 5, 2013.

[21] Intergovernmental Panel on Climate Change. 1996. 1995: Science of Climate Change. (Second Assessment Report). Cambridge, U.K.: Cambridge University Press.

N_2O concentrations in the atmosphere have increased 18 percent from pre-industrial levels of 270 ppb to 324 ppb.[22,23]

Sulfur Hexafluoride. SF_6, a human-made chemical used as an electrical insulating fluid for power distribution equipment, in the magnesium casting, in semiconductor manufacturing, and also as a tracer chemical for the study of oceanic and atmospheric processes.[24] SF_6 is the most powerful of all GHGs listed in IPCC studies, with a GWP of 23,900.[25] SF_6 concentrations in the atmosphere have risen from 0 to more than 7.5 ppt since pre-industrial times.[26]

Greenhouse Gas Emissions Inventories

A GHG inventory is an accounting of the amount of GHGs emitted to or removed from the atmosphere over a specified period of time attributed to activities by a particular entity (e.g., annual emissions and reductions attributed to the state of California). A GHG inventory also provides information on the activities that cause emissions and removals, as well as the methods used to make the calculations. Table 3.5-2 outlines the most recent global, national, state, and local GHG inventories available to help contextualize the magnitude of potential Project-related emissions.

Project Site Inventory

Existing development at the Project site consists of a 217,396-square-foot (sf) warehouse and distillery industrial complex, which has been vacant since July 2011 (Commonwealth Site), and an in-use 20,462-sf light industrial building (Jefferson Site). However, due to the vacancy of the former distillery on the Commonwealth Site, no existing emissions are assumed at this location. Only the existing emissions associated with the current operations at the Jefferson Site are considered in the discussion below.

An inventory of the GHG emissions generated by existing uses at the Jefferson Site is provided in Table 3.5-3, below. The GHG emissions were estimated using the California Emission Estimator Model (CalEEMod), version 2011.1.1. The emissions of the individual GHG gases (CO_2, CH_4, and N_2O) were estimated and the total CO_2e emissions are calculated using the GWP for each gas. The inventory includes the following emissions.

- **Area Source Emissions.** Area source emissions are direct emissions sources including existing emissions from landscaping equipment. These emissions were estimated using CalEEMod default emission factors and land use assumptions.

[22] Carbon Dioxide Information Analysis Center. 2013. *Recent Greenhouse Gas Concentrations*. Last Revised: February 2013. Available: <http://cdiac.ornl.gov/pns/current_ghg.html>. Accessed: December 17, 2013.

[23] Intergovernmental Panel on Climate Change. 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). Available: <http://www.ipcc.ch/ipccreports/ar4-wg1.htm>. Accessed: April 5, 2013.

[24] U.S. Environmental Protection Agency. 2013. *F-Gases Emissions| Climate Change| US EPA*. Available: <http://epa.gov/climatechange/ghgemissions/gases/fgases.html#Trends>. Last revised: September 9, 2013. Accessed: October 2013.

[25] Intergovernmental Panel on Climate Change. 1996. 1995: Science of Climate Change. (Second Assessment Report). Cambridge, U.K.: Cambridge University Press.

[26] Carbon Dioxide Information Analysis Center. 2013. *Recent Greenhouse Gas Concentrations*. Last Revised: February 2013. Available: <http://cdiac.ornl.gov/pns/current_ghg.html>. Accessed: December 17, 2013.

Table 3.5-2. Global, National, and State Greenhouse Gas Emissions Inventories

Emissions Inventory	CO_2e (metric tons)
2004 IPCC Global GHG Emissions Inventory	49,000,000,000
2011 EPA National GHG Emissions Inventory	6,708,300,000
2010 ARB State GHG Emissions Inventory	451,600,000
2007 SFBAAB GHG Emissions Inventory	95,800,000

Sources:

- Bay Area Air Quality Management District. 2010. Source Inventory of Bay Area Greenhouse Gas Emissions. Available: <http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007_2_10.ashx>. Accessed: June 5, 2013.
- Intergovernmental Panel on Climate Change. 2007. Introduction. In B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer, (eds.), Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007. Cambridge, U.K. and New York, NY, USA: Cambridge University Press. Available: <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter1.pdf>. Accessed: April 5, 2013.
- California Air Resources Board. 2013. California Greenhouse Gas Inventory for 2000-2010 – by Category as Defined in the Scoping Plan. Last Reviewed: March 21, 2013. Available: <http://www.arb.ca.gov/cc/inventory/data/data.htm>. Accessed: April 5, 2013.
- U.S. Environmental Protection Agency. 2013. Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011: Executive Summary. Available: <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2011-ES-Executive-Summary.pdf>. Accessed: April 5, 2013.

CO_2e = carbon dioxide equivalent

- **Emissions Associated with Energy Use.** The generation of electricity through the combustion of fossil fuels typically yields CO_2, and to a much smaller extent, CH_4 and N_2O. By consuming electricity, existing facilities generate indirect GHG emissions. Electrical power is supplied to the Project site by Pacific Gas and Electric (PG&E). Accordingly, indirect GHG emissions from electricity usage are calculated using the PG&E carbon-intensity factor used by the City of 0.568 pounds per kilowatt hour (lb/kWh).[27] The combustion of natural gas onsite for heating and other purposes in buildings generates direct emissions of CO_2 and, to a much smaller extent, CH_4 and N_2O. Existing electricity and natural gas usage, which was used to estimate GHG emissions from existing facilities, is based on the existing usage data provided by the Sobrato Organization (Project Sponsor).
- **Emissions Associated with Water Supply.** GHG emissions are also generated by the infrastructure used to distribute and treat the domestic water supply and by infrastructure used to collect and treat wastewater. By consuming water and generating wastewater, development at the Jefferson Site contributes to these emissions. Emissions associated with the existing water demand were provided in the Water Supply Assessment (WSA) Report prepared for the Project.

[27] Menlo Park. 2012. Chapter 3.7, Greenhouse Gas Emissions, of the Facebook Campus Project - Environmental Impact Report. April.

- **Solid Waste Disposed Emissions.** According to EPA's emissions reporting protocol, emissions of CO_2 from solid waste interment are considered to be biogenic GHGs and part of the carbon cycle; therefore, they are typically not included in GHG emission inventories.[28] Nevertheless, fugitive CH_4 emissions associated with solid waste management have been estimated for use in this analysis based on the method used by CalEEMod.
- **Vehicular Emissions.** Employee and visitor vehicle trips associated with existing land uses represent the largest portion of the existing emissions inventory. GHG emissions associated with existing vehicle trips were estimated using the employee trips shown in Section 3.3, *Transportation and Traffic*, CalEEMod default emission factors for the year 2013, and CalEEMod default trip lengths for work-related trips in San Mateo County.
- **Urban Forest.** *Urban forest* refers to trees and other vegetation planted within developed areas, including residential trees, urban parks, and median trees. Unlike other sectors described above, urban forests are emissions sinks that actively sequester (i.e. remove) atmospheric CO_2. There are currently 45 trees on the Project site. Forestry emission sinks under existing and Project conditions were estimated using CalEEMod.

It is believed that the above sources represent the vast majority of the GHG emissions associated with existing development on the Jefferson Site. Existing facilities may emit a small amount of HFC emissions from leakage and service of refrigeration and air conditioning equipment and from disposal at the end of the life of the equipment; however, the contributions of these emissions to the total inventory are likely quite small. PFCs and SF_6 are typically used in industrial activities that are not conducted at the Project site. Ozone has characteristics of a GHG; however, unlike regulated GHGs, ozone in the troposphere is relatively short-lived and, therefore, has localized rather than global effects. According to ARB,[29] it is difficult to make an accurate determination of the contribution of ozone precursors (nitrogen oxides [NO_X] and reactive organic gases [ROGs]) to global warming. Therefore, the inventory presented in Table 3.5-3 represents an estimate of all emissions directly and indirectly associated with current onsite operations.

Predicted Effects of Climate Change

Climate change could have a number of adverse effects. Although these effects would have global consequences, in most cases they would not disproportionately affect any one site or activity. In other words, many of the effects of climate change are not site-specific. Emission of GHGs would contribute to the changes in the global climate, which would in turn, have a number of physical and environmental effects. A number of general effects are discussed below.

Sea Level Rise and Flooding. Measurements taken in the San Francisco Bay (Bay) indicate that the current rate of sea level rise is about 3.5 inches per century at Alameda and 8.4 inches per century at San Francisco.[30] Climate change effects on sea levels could lead to even higher rates of sea level rise (accelerated sea level rise).

[28] U.S. Environmental Protection Agency. 1995. AP 42, Fifth Edition: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources.

[29] California Air Resources Board. 2004. Fact Sheet, Climate Change Emission Control Regulations.

[30] California Department of Water Resources. 2006. Progress on Incorporating Climate Change into Planning and Management of California's Water Resources Technical Memorandum Report. Table 2-6. Available at: <http://www.water.ca.gov/climatechange/docs/DWRClimateChangeJuly06.pdf>. Last Accessed: June 12, 2013.

Table 3.5-3. Existing Operational Greenhouse Gas Emissions at the Project Site

	CO_2	CH_4	N_2O	CO_2e
Source Category	Metric tons/year			
Area	< 0.01	0	0	< 0.01
Energy Use[a]	1.33	0	0	1.34
Vehicular[b]	141.03	0.01	0	141.16
Water[c]	0.36	0.01	0	0.59
Waste[d]	1.66	0.1	0	3.73
Urban Forest	-31.15			-31.15
Total	113.23	0.12	0	115.67

Sources:

[a.] Sobrato Organization, 2013

[b.] DKS Associates, 2013

[c.] GHD, 2013

Notes:

Please refer to Appendix 3.4-1 for emission calculation assumptions and model inputs and outputs.

[a.] Based on the existing usage data provided by the Project Sponsor.

[b.] Based on the existing employee trips shown in Section 3.3, Transportation and Traffic and Appendix 3.3.

[c.] Existing water demand was provided in the Water Supply Assessment (WSA) Report (Appendix 3.13)

[d.] No existing waste data is available. Existing waste generation rate of tons per square feet is assumed to be the same as proposed Project.

Different scenarios and models used to predict sea level rise result in different estimates of the magnitude of sea level rise. For example, the California Climate Change Center predicts that accelerated sea level rise could result in a sea level rise in California of 4.3 to 28.2 inches above the existing mean sea level (msl) by 2099.[31] The California Climate Action Team (CAT) projects that sea levels could rise as much as 71.6 inches by the year 2099.[32]

In October 2011, the San Francisco Bay Conservation and Development Commission (BCDC) adopted the latest amendment to the Bay Plan. The Bay Plan states that the Bay will rise 10 to 17 inches by 2050, 17 to 32 inches by 2070, and 55 to 69 inches by the end of the century if current trends continue.[33]

[31] Cayan, D. P. Bromirski, K. Hayhoe, M. Tyree, M. Dettinger, and R. Flick. 2006. Projecting Future Sea Level. California Energy Commission. Table 3. July 2006. Available at:<http://www.energy.ca.gov/2005publications/CEC-500-2005-202/CEC-500-2005-202-SF.PDF>. Last Accessed: June 12, 2013.

[32] California Climate Action Team. 2006. Executive Summary, 2006 Final Climate Action Team Report to the Governor and Legislature. April. Available at: <http://www.water.ca.gov/climatechange/docs/DWRClimateChangeJuly06.pdf>. Last Accessed: October, 2013.

[33] San Francisco Bay Conservation and Development Commission. 2011. Resolution No. 11-08: Adoption of Bay Plan Amendment No. 1-08 Adding New Climate Change Findings and Policies to the Bay Plan; And Revising the Bay Plan Tidal Marsh and Tidal Flats; Safety of Fills; Protection of the Shoreline; and Public Access Findings and Policies. Page 11. Adopted October 2011. Available at:<http://www.bcdc.ca.gov/proposed_bay_plan/10-01Resolution.pdf>. Last Accessed: June 12, 2013.

In the future, precipitation events are predicted to vary in terms of timing, intensity, and volume according to many climate change models. Extreme storm events may occur with greater frequency.[34] Alterations in the flow regime and subsequent flood potential could also occur from effects of climate change on local and regional precipitation patterns. These issues are addressed in Section 3.9, *Hydrology and Water Quality*.

Water Supply. California Health and Safety Code Section 38501(a) recognizes that climate change "poses a serious threat to the economic well-being, public health, natural resources, and the environment of California," and notes, "the potential adverse impacts of [climate change] include…reduction in the quality and supply of water to the State from the Sierra snowpack." As most of the state, including the Bay Area, depends on surface water supplies originating in the Sierra Nevada, this water supply reduction is a concern.

Most of the scientific models addressing climate change show that the primary effect on California's climate would be a reduced snow pack and a shift in stream-flow seasonality. A higher percentage of the winter precipitation in the mountains would likely fall as rain rather than as snow in some locations, thereby reducing the overall snowpack. Further, as temperatures rise, snowmelt is expected to occur earlier in the year resulting in peak runoff that would likely come a month or so earlier. The end result of this would be that the state may not have sufficient surface storage to capture the resulting early runoff. As a result of absent construction of additional water storage projects, a portion of the current supplies would be lost to the oceans rather than be available for use in the state's water delivery systems.

Water Quality. Climate change could have adverse effects on water quality, which would, in turn, affect the beneficial uses (habitat, water supply, etc.) of surface water bodies and groundwater. The changes in precipitation discussed above could result in increased sedimentation, higher concentration of pollutants, higher dissolved oxygen levels, increased temperatures, and an increase in the amount of runoff constituents reaching surface water bodies. Sea level rise, discussed above, could result in the encroachment of saline water into freshwater bodies.[35]

Ecosystems and Biodiversity. Climate change is expected to have effects on diverse types of ecosystems, from alpine to deep sea habitat. As temperatures and precipitation change, seasonal shifts in vegetation would occur; this could affect the distribution of associated flora and fauna species. As the range of species shifts, habitat fragmentation could occur, with acute impacts on the distribution of certain sensitive species. The IPCC states that "[a]pproximately 20-30 percent of plant and animal species assessed so far are likely to be at increased risk of extinction if increases in global average

[34] U.S. Environmental Protection Agency. 2013. Climate Change Indicators in the United States| Weather and Climate. Available at: <http://www.epa.gov/climatechange/science/indicators/weather-climate/index.html>. Last updated: April 22, 2013. Last Accessed: June 12, 2013.

[35] Intergovernmental Panel on Climate Change. 2007. Summary for Policy makers. In Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.). Cambridge University Press, Cambridge, United Kingdom, 1000 pp. Available: <http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg2_report_impacts_adaptation_and_vulnerability.htm>. Last Accessed: June 12, 2013.

temperature exceed 1.5-2.5°C" relative to pre-industrial levels.[36] Shifts in existing biomes could also make ecosystems vulnerable to encroachment of foreign species. These disruptions can cause ripple effects in food webs for a wide range of organisms. In general terms, climate change is expected to put a number of stressors on ecosystems, with potentially catastrophic effects on biodiversity.[37]

Human Health Impacts. Climate change may also increase the risk of vector-borne infectious diseases, particularly those found in tropical areas and spread by insects, such as Lyme disease and West Nile Virus. The presence of harmful bacteria and *Cryptosporidium* and *Giardia*, water-borne parasites, could also increase in the event of heavy rainfall or flooding and contaminate drinking water. While these health impacts would largely affect tropical areas in other parts of the world, effects would also be felt in California. Warming of the atmosphere would be expected to increase ground-level ozone, which could adversely affect individuals with heart and respiratory problems, such as asthma. Extreme heat events would also be expected to occur with more frequency and could adversely affect sensitive populations, such as the elderly and children. Finally, the water supply impacts and seasonal temperature variations expected as a result of climate change could affect the viability of existing agricultural operations, making the food supply more vulnerable.[38]

Heat Island Effect. Although not a direct cause by climate change, the impact of the heat island effect may be exasperated by the increase frequency of heating days due to climate change. The heat island effect is created by paved urban areas that tend to absorb rather than reflect solar radiation due to dark asphalt surfaces, resulting in greater temperatures above and surrounding these areas than nearby rural areas. According to EPA, this effect can result in greater energy demands for air conditioning, increased air pollution and GHG emissions due to these increased energy demands, heat-related illness and mortality, and effects on water quality.[39]

Environmental Impacts

This section describes the impact analysis relating to GHGs and climate change for the Project. It describes the methods used to determine the impacts of the Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Project would be considered to have a significant effect if it would result in any of the conditions listed below.

[36] Intergovernmental Panel on Climate Change. 2007. Summary for Policy makers. In Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.). Cambridge University Press, Cambridge, United Kingdom, 1000 pp. Available: <http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg2_report_impacts_adaptation_and_vulnerability.htm>. Last Accessed: June 12, 2013.

[37] U.S. Environmental Protection Agency. 2013. Ecosystems Impacts & Adaptation. Available:<http://www.epa.gov/climatechange/impacts-adaptation/ecosystems.html>. Last Updated: April 22, 2013. Last Accessed June 12, 2013.

[38] U.S. Environmental Protection Agency. 2013. Human Health Impacts & Adaptation. Available at:<http://www.epa.gov/climatechange/impacts-adaptation/health.html#impactsdiseases>. Last Updated: May 14, 2013. Last Accessed: June 12, 2013.

[39] U.S. Environmental Protection Agency. 2013. Heat Island Effect. Available at: <http://www.epa.gov/hiri/>. Last updated: March 7, 2013. Last Accessed: June 12, 2013.

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Climate Change

The State CEQA Guidelines are currently silent on whether CEQA evaluations should address the potential impacts of climate change on a project.

The Court of Appeals recently found that while an EIR must analyze environmental effects that may result from a project, it is not required to examine the effects of the environment on the project (see *Ballona Wetland Foundation v. City of Los Angeles*, 201 Cal. App. 4th 455). The *Ballona* decision potentially eliminates the need for lead agencies in the second appellate district to consider impacts of climate change on proposed projects. Unless legislation overturns the *Ballona* decision,[40] courts throughout the state will be presented with the case as precedent. Nonetheless, courts outside the second district will have the discretion to differ in their interpretation of the State CEQA Guidelines and may find that an analysis of climate change effects on proposed projects is required.[41] Accordingly, a discussion of the climate change issue has been included in this EIR for informational purposes.

Construction Emissions

Construction emissions represent a small portion of overall emissions in the Bay Area. Unlike operational emissions, they are also temporary and limited to the construction period. BAAQMD has not established a quantitative threshold for the evaluation of construction-related GHG emissions. However, BAAQMD recommends that GHG emissions from construction be quantified and disclosed and that a determination regarding the significance of these GHG emissions be made with respect to whether a project is consistent with the AB 32 GHG emission reduction goals. The BAAQMD further recommends that best management practices (BMPs) be incorporated to reduce GHG emissions during construction, as feasible and applicable. BMPs may include using alternative-fueled (e.g., biodiesel, electric) construction vehicles and equipment for at least 15 percent of the fleet, using at least 10 percent of local building materials, and recycling or reusing at least 50 percent of construction waste or demolition materials.[42] The significance of construction GHG emissions is therefore evaluated by considering the overall magnitude of emissions, as well as determining whether the Project has incorporated feasible BMPs.

Operational Emissions

BAAQMD's CEQA Guidelines outline advisory GHG thresholds for operational emissions of GHGs for both stationary sources that require a district permit to operate, and projects other than stationary sources.[43]

[40] On March 21, 2012, the California Supreme Court denied case review and depublication requests submitted by several environmental organizations.

[41] Menlo Park is in the first district.

[42] Bay Area Air Quality Management District. 2010. Draft CEQA Air Quality Guidelines. Available: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx. Accessed: October 2013.

[43] Bay Area Air Quality Management District. 2010. Draft CEQA Air Quality Guidelines. May. Available: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx. Accessed: October 2013.

The City has independently reviewed the BAAQMD proposed thresholds and determined that they are supported on substantial evidence and are appropriate for use to determine significance in the environmental review of this Project. Specifically, the City has determined that the BAAQMD thresholds are well-grounded on regulations, scientific evidence, and scientific reasoning concerning air quality and GHG emissions. Using these thresholds for the Project also allows a rigorous standardized approach of determining whether the Project would cause a significant air quality impact. BAAQMD's Justification Report explains the agency's reasoning for adopting the thresholds.[44] Below is a summary of the basis upon which the BAAQMD's thresholds were developed.

The stationary source threshold for permitted sources is 10,000 MT of CO_2e per year and is used to evaluate the emergency generator testing emissions.

For project emissions other than permitted stationary sources, BAAQMD has three options that can be used for comparison based on the lead agency's discretion.

- Compliance with a qualified GHG Reduction Strategy; or
- Annual emissions less than 1,100 metric tons of CO2e per year; or
- Annual emissions of less than 4.6 metric tons of CO2e per service population[45] (MT CO_2e/SP/yr).

As described in the *Regulatory Setting*, although the City has a greenhouse gas reduction target and a CAP, they do not constitute a qualified GHG reduction plan as defined in the BAAQMD CEQA Guidelines. Accordingly, compliance with a qualified GHG reduction strategy is not an option. Emissions from a project of this magnitude are likely to exceed the second threshold, 1,100 MT of CO_2e per year. BAAQMD recommends that land-use driven projects be analyzed using either the second or the third threshold, which is a GHG efficiency metric. GHG efficiency metrics were developed from the emissions rates at the state level for the land use sector that would accommodate projected growth (as indicated by population and employment growth) under trend forecast conditions allowing for consistency with the goals of AB 32 (i.e., 1990 GHG emissions levels by 2020).[46] The land use efficiency metric is appropriate because the threshold can be applied evenly to all project types (residential or commercial/retail only or mixed use) and uses only the land use inventory that is comprised of all land use projects. For this Project, the efficiency goal of 4.6 MT CO_2e per service population per year has been selected by the City, as the Lead Agency, as the threshold of significance for the land use related emissions of the Project combined with the amortized construction emissions.

Methods for Analysis

The analysis of climate change impacts involves determining a GHG emission inventory for the Project sources that then can be used as a comparison to thresholds of significance to determine if the Project would result in cumulative impacts. This section describes the methodology that was used to develop the GHG emissions inventories associated with the Project. As recommended by the BAAQMD CEQA

[44] Bay Area Air Quality Management District. 2009. Revised Draft Options and Justification Report: California Environmental Quality Act Thresholds of Significance. October. San Francisco, CA.

[45] Service population is the sum of residents and employees of a land use development project.

[46] Bay Area Air Quality Management District. 2009. Revised Draft Options and Justification Report: California Environmental Quality Act Thresholds of Significance. October. San Francisco, CA.

Guidelines,[47] these inventories consider the following categories of GHG emissions: construction, area sources, energy use, water use, waste disposed, traffic, and stationary source emissions (which, in this case, consist solely of emergency generator testing). The CalEEMod model was used to assist in quantifying the GHG emissions in the inventories for the Project presented in this Draft EIR.

Legislation and rules regarding climate change, as well as the scientific understanding of the extent to which different activities emit GHGs, continue to evolve; as such, the inventories in this report are a reflection of the guidance and knowledge currently available.

Construction Emissions

There are three major construction phases associated with development of the Project site: demolition, excavation and grading, and building construction. CalEEMod was used in quantifying the construction emissions based on the construction activities and the anticipated schedule and durations provided by the Project Sponsor. The construction equipment list was developed independently by ICF, using CalEEMod defaults as a basis, and verified by the Project Sponsor. GHG emissions from these construction phases are largely attributable to fuel use from construction equipment and vehicle trips. The primary GHG emissions generated by these sources are CO_2, CH_4, and N_2O, which were estimated using the CalEEMod. The CalEEMod model inputs and assumptions are provided for reference in Appendix 3.4-2.

Operational Emissions

Direct emissions from traffic and area sources and indirect emissions from energy, water use, wastewater, and waste management would occur every year after buildout. Emergency generator testing would also occur periodically. The CalEEMod model was used to assist in quantification of the operational emissions, except for emergency generator testing, which was based on the manufacturer-specified emission factors for the proposed diesel generators and the emission factors from OFFROAD2011. This methodology is also discussed in Section 3.4, *Air Quality*.

Project-specific data and assumptions used to estimate the operational GHG emissions for each source category are briefly described below within the additional information and CalEEMod model assumptions provided in Appendix 3.4-1.

- **Area Source Emissions.** Proposed emissions generated by these area sources were estimated using the same approach described for the existing Project site inventory above.
- **Emissions Associated with Energy Use.** The combustion of natural gas on-site for heating, cooking, and other purposes in buildings generates direct emissions of GHG emissions. The onsite electricity usage generates indirect GHG emissions through the combustion of fossil fuels to generate electrical power. Proposed emissions generated by electricity and natural gas usage were estimated using the site-specific data provided by the Project Sponsor. The electricity and natural gas analysis takes into account that the Project would meet Title 24 standards.
- **Emissions Associated with Water Supply.** Proposed emissions associated with interior and exterior water demand were estimated using the same approach described for the existing Project site inventory above.

[47] Bay Area Air Quality Management District. 2010. Draft CEQA Air Quality Guidelines. May. Available: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx. Accessed: October 2013.

- **Solid Waste Disposed Emissions.** Proposed fugitive CH_4 emissions associated with solid waste management have been estimated for use in this analysis based on the site-specific data provided by the Project Sponsor. The Project would recycle 50 percent of total office waste (about 88 tons per year) and compose all the food waste (about 19.3 tons per year), which would result in a reduction of about 59 percent of the solid waste generated at the site, according to the data provided by the Project Sponsor.
- **Vehicular Emissions.** Vehicle emissions associated with proposed employee and visitor vehicle trips were estimated using the same approach described for the existing Project site inventory above. Note the analysis of motor vehicle emissions does not include the effects of the proposed TDM Plan/Program associated with the Project as discussed in Chapter 2, *Project Description*.
- **Emissions Associated with Generator Test.** Emergency generators emit GHGs when they are tested to ensure proper functioning. It was assumed that each of the two emergency generators would be tested once per week for 30 minutes, as specified by the Project Sponsor. To calculate emissions, the horsepower rating of the engine is multiplied by an emission factor for each pollutant and the total number of hours operated per year. Manufacturer-specified emission factors were obtained from information supplied by the Project Sponsor.
- **Urban Forest.** Emission associate with proposed emission sinks were estimated using the same approach described for the existing Project site inventory above. There would be 474 new trees planted at the Project site to replace the 44 existing trees.

Because the Project would replace existing operations at the Project site, operational emissions generated by the existing businesses would be replaced with operational emissions associated with the Project. Therefore, net operational emissions increase at the Project site is calculated by taking into account the existing operational emissions at the Jefferson Site[48] as a credit and subtracting the existing emissions at the Jefferson Site from the operational emissions associated with the Project.

Impacts and Mitigation Measures

Impact GHG-1: Greenhouse Gas Emissions during Project Construction. The Project would generate greenhouse gas emissions during Project construction. (PS)

Project construction would generate emissions of CO_2, CH_4, and N_2O from mobile and stationary construction equipment exhaust, and employee and haul truck vehicle exhaust. Estimated construction emissions associated with the Project are summarized in Table 3.5-4. There are three major construction phases associated with development of the Project site: demolition of the existing structures, excavation/grading, and building construction. For purposes of this analysis, it is anticipated that the construction process would start in approximately April 2014 with the demolition of the existing buildings and would continue over approximately 15 months, with full buildout by approximately mid-2015.[49] Construction emissions are estimated based on the construction activities and the anticipated schedule and durations provided by the Project Sponsor. Detailed information on emissions modeling and quantification methds is provided in Appendix 3.4-2.

[48] As previously indicated, no existing emissions are assumed at the Commonwealth Site, while current operations at the Jefferson Site represent existing emissions.

[49] When the NOP for this Project was issued in August 2012, a start date of April 2014 was anticipated. Therefore, the analysis presented in this EIR assumes an April 2014 construction start date. However, due to unforeseen delays, it is anticipated that the actual start date will be later. The construction dates are estimates and used for analytical purposes only; the delayed construction start date does not impact the accuracy of the analysis.

As shown in Table 3.5-4, Project construction would generate approximately 862 MT of CO_2e during the construction period. This is equivalent to adding 169 typical passenger vehicles per year[50] to the road during the construction period.[51] The construction emissions are primarily the result of diesel-powered construction equipment and heavy-duty haul trucks. Because construction emissions would cease once construction is complete, they are considered short-term.

Table 3.5-4. Project Construction Greenhouse Gas Emissions

	CO_2	CH_4	N_2O	CO_2e
Construction Phase			Metric tons	
Demolition	183.39	0.02	0.00	183.73
Excavation and Grading	48.36	0.00	0.00	48.43
Building Construction (2014)[a]	339.20	0.03	0.00	339.91
Total 2014 Annual Emissions	570.96	0.05	0.00	572.06
Building Construction (2015)[a]	289.33	0.02	0.00	289.78
Total Construction Emission	860.29	0.07	0.00	861.84

Notes:

Please refer to Appendix 3.4-2 for a summary of phases assumed during each construction period.

a. Building construction would occur in both 2014 and 2015 based on the construction schedule provided by the Project Sponsor.

As discussed above, BAAQMD's CEQA Guidelines do not recommend a GHG emission threshold for construction-related emissions. Therefore, the construction GHG impact is considered ***potentially significant***.

MITIGATION MEASURE. Because BAAQMD recommends implementation of BMPs to help control and reduce GHG emissions, the BMPs listed below are recommended for reducing construction-related GHG emissions. As discussed in Chapter 2, *Project Description*, the Project would recycle approximately 75 percent of all debris resulting from demolition and excavation activities during construction. The construction-related GHG impact is considered ***less than significant*** with implementation the Project Sponsor's commitment to recycle 75 percent of construction debris and the other BAAQMD-recommended BMPs, deemed feasible, as listed in Mitigation Measure GHG-1.1.

GHG-1.1: Implement BAAQMD Best Management Practices for Construction. The Project Sponsor shall require all construction contractors to implement the BMPs recommended by the BAAQMD to reduce GHG emissions. Emission reduction measures shall include, at a minimum, the use of local building materials of at least 10 percent, the reuse of materials, such as concrete on site of at least 20 percent, and the use of alternative fueled vehicles for construction vehicles/equipment.

[50] A typical passenger vehicle emits about 5.1 metric tons of carbon dioxide per year (EPA 2011).

[51] U.S. Environmental Protection Agency. 2011. Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle. December. Available: <http://www.epa.gov/otaq/climate/documents/420f11041.pdf>. Accessed: October 2013.

Impact GHG-2: Greenhouse Gas Emissions During Project Operation. The Project would not generate significant greenhouse emissions during operation. (LTS)

Project operation would generate direct and indirect GHG emissions. Sources of direct emissions include mobile vehicle trips, natural gas combustion, and landscaping activities. Indirect emissions would be generated by electricity generation and consumption, waste and wastewater generation, and water use. Emission sinks that remove atmospheric CO_2 include trees and vegetation planted on the Project site. Similar emissions sources and sinks are currently operating on the Project site at the existing office and commercial buildings. Emissions generated by these uses represent existing conditions, against which the Project must be evaluated.

Estimated operations emissions under both existing and Project conditions are summarized in Table 3.5-5. The difference in operational emissions between the Project and the existing commercial uses represents the net new impact of the Project. Note that operational emissions associated with the Project reflect design features associated with building energy use and waste disposal. Please refer to Chapter 2, *Project Description*, for a discussion of design features that would help to reduce GHG emissions. The electricity and natural gas analysis takes into account that the Project would meet CalGreen/Title 24 standards (based on the 2010 Building Energy Efficiency Standards). The 2013 Building Energy Efficiency Standards will go into effect on July 1, 2014 will continue to improve upon the current 2010 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The Project would adhere to the 2013 Standards. The Project would also recycle about 34 percent of the solid waste generated at the site, according to the data provided by the Project Sponsor.

Table 3.5-5 summarizes the GHG emissions and the comparison to the applicable threshold of significance. The emergency generator testing emissions of approximately 4 MT of CO_2e per year are well below the stationary source threshold of 10,000 MT of CO_2e per year. The operational emissions result in approximately 3.5 MT of CO_2e per service population per year, which is less than the threshold of 4.6 MT of CO_2e per service population per year.

Based on the justification that BAAQMD utilized in establishing its threshold of significance for GHGs, it is not necessary to consider the impacts of other foreseeable projects such as the Tier 1 and Tier 2 projects. As stated on page 2-1 of BAAQMD's CEQA Guidelines:

> 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. BAAQMD's approach to developing a Threshold of Significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions needed to move us towards climate stabilization. If a project would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact, and would be considered significant.

As stated above, the Project would not generate GHG emissions above the threshold and, therefore, in combination with present and future projects, would not contribute to a significant cumulative impact. The impact of operational GHG emissions is considered ***less than significant***.

Impact GHG-3: Conflicts with Applicable Greenhouse Gas Emission Plans, Policies, and Regulations. The Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (LTS)

The Project would not pose any explicit conflict with the applicable list of ARB GHG reduction strategies outlined in the Climate Change Scoping Plan designed to meet the objectives of AB 32 to reduce GHG emissions to 1990 levels by 2020. Many of the reduction strategies outlined in the Scoping Plan require statewide action by government, industry, or both. Some of the measures are applicable to the Project that do not require government action, such as improving building energy use, constructing green buildings, water efficiency, and reducing solid waste through recycling, many of which have been incorporated as part of the Project.

The Project is consistent with AB 32 goals by virtue of the City's reliance on the BAAQMD's AB 32 derived per-capita efficiency threshold of 4.6 MT of CO2e per service population per year under Impact GHG-2, above. The BAAQMD threshold was based on the 1990 GHG emission level divided by the service population for 2020. Since the Project's GHG emissions fall below this BAAQMD threshold derived from AB 32 attainment goals, the Project would not conflict with AB 32 and its associated planning efforts.

The General Plan includes goals and policies in the Open Space and Conservation Element that focus on GHG emissions and climate change. In addition, a number of goals and policies from the Land Use and Circulation Element in the General apply broadly to planning efforts aimed to reduce GHG emissions. The Project would be consistent and would not conflict with a variety of General Plan goals and policies, as listed earlier in this document *Regulatory Setting*.

In 2009, the City published a CAP that outlines a number of municipal and community emissions reduction strategies. In 2011, a CAP Assessment Report was published, which evaluates the recent GHG emissions and suggests new GHG reduction strategies to consider. On July 26, 2011, the City Council approved that the strategies listed in this new assessment replace the strategies from the 2009 CAP. Table 3.5-6 presents the community strategies contained in the CAP and correlates each to a specific element or mitigation measure of the Project that address the strategy.

A review of Table 3.5-6 indicates that the Project is consistent with all of the strategies that would reasonably be applicable to a land use development project. In addition, the Project would implement several GHG reduction measures as discussed in Chapter 2, *Project Description*. These measures include including installing conduit in the parking lots to accommodate potential electric vehicle charging stations, "quick chargers", and potential photovoltaic arrays; designing the electrical panels to account for the future load of potential charging stations; structurally accounting for rooftop loads for potential photovoltaic arrays or a potential solar thermal hot water system; and locating future shafts for tubing of a thermal hot water system. Furthermore, as indicated above, the Project would adhere to the 2013 Building Energy Efficiency Standards.

Beyond the goals of AB 32, Executive Order S-3-05 sets a goal of reducing emissions to 80 percent below 1990 emissions by 2050. AB 32 met one of S-3-05 objectives of reducing GHG emissions to 1990 levels by 2020. At this time, no specific strategies have been identified to reach the 2050 goal. The technologies needed to reach this goal are unknown and speculative but will likely be a result of technologies that reduce building energy use, water use, improve vehicle economy and decarbonization of the fuel supply for vehicles and electricity generation. Furthermore, it is unknown if the Project will have been modified from the use and design evaluated in this Draft EIR, as land uses may change within this time frame. Therefore, it is too speculative at this time to assess if the Project is consistent with the GHG emission goal for 2050.

Table 3.5-5. Project Operations Greenhouse Gas Emissions

	CO_2	CH_4	N_2O	CO_2e
Source Category	Metric tons/year			
Existing Operations [a]				
Area	< 0.01	0	0	< 0.01
Energy Use	1.33	0	0	1.34
Vehicular	141.03	0.01	0	141.16
Waste	1.66	0.1	0	3.73
Water	0.36	0.01	0	0.59
Urban Forest	-31.15			-31.15
Total	127.36	0.08	0	115.67
Proposed Operations [b]				
Area	< 0.01	0	0	< 0.01
Energy Use	729.6	0.03	0.01	734.68
Vehicular	3,940.46	0.15	0	3,943.59
Waste	9.13	0.54	0	20.46
Water	12.05	0	0.01	13.89
Urban Forest	-57.35			-57.35
Total without Generator	4,633.89	0.72	0.02	4,655.27
Net Emission Increase [c]	4,520.66	0.60	0.02	4,539.60
Net Emission Increase Service Population [d]				3.5
BAAQMD Threshold (MT CO_2e/SP/yr)				4.6
Exceed Thresholds?				No
Proposed Emergency Operation				
Generator	4.20	0.001	0.00	4.23
BAAQMD Threshold for Stationary Source				10,000
Exceed Thresholds?				No

Notes:

Please refer to Appendix 3.4-1 for emission calculation assumptions and model inputs and outputs.

a. Represents emissions associated with existing commercial uses currently operating on the Project site. These emissions would cease with implementation of the Project. No emissions are assumed for the currently unoccupied portion of the Project site.

b. Represents emissions associated with the Project. Emissions are modeled for the first operational year of 2016. Modeling accounts for the following design strategies: solid waste recycle rate of about 59 percent; and Title 24 standard (based on the 2010 Building Energy Efficiency Standards) for electricity and natural gas usage.

c. Represents the net Project impact, or the change in emissions relative to existing conditions.

d. The Project buildout would have capacity of approximately 1,300 office employees. The 3.5 Service Population threshold was calculated by dividing net GHG emissions by the number of employees at buildout (4540/1300), for a project Service Population of 3.5.

In addition, the MTC and ABAG are responsible for developing the local sustainable community strategy (SCS) that implements SB 375 GHG reductions. On July 18, 2013, MTC and ABAG jointly approved *Plan Bay Area*, which is the region's 2040 Regional Transportation Plan and includes the region's SCS. The SCS is required to promote compact, mixed-use commercial and residential development and *Plan Bay Area* fulfills this requirement by accelerating efforts to emphasize, encourage, and expand infill growth and development. Because the Project would include redevelopment of previously developed parcels, the Project is consistent with the goals of *Plan Bay Area* to promote infill development, thereby ensuring consistency with SB 375 reduction requirements.

Table 3.5-6. Climate Action Plan Strategies to be Implemented at the Community Level

CAP Strategies	Project Compliance
Energy Efficiency	
Consider adopting Sustainable Development/Green Building standards that exceed California's 2010 Green Building Code (CalGreen) for Residential and Commercial	The Project would meet CalGreen/Title 24 and any amendments required by the City, which would provide 15 percent greater energy efficiency than the California Energy Code. Project lighting would be designed to follow the performance standards set by LEED.
Consider actively marketing and providing additional incentives for residents to participate in the new Regional Energy Upgrade California Program	This strategy is not applicable to local development as it is a City-sponsored education program designated for further study.
Expand Menlo Park Municipal Water District Conservation Programs	This strategy is not applicable to local development as it is a City-sponsored program designated for further study.
Consider developing an Energy Efficiency/ Renewable Energy Program for Residential sector	This strategy is not applicable to local development as it is a City sponsored program designated for residential sector and not commercial.
Develop a commercial energy efficiency program to encourage businesses to participate in a free energy efficiency audit when business license is issued or renewed	This strategy is not applicable to local development as it is a City-sponsored program designated for further study.
Consider local energy efficiency and renewable energy financing program	This strategy is not applicable to local development as it is a City-sponsored program designated for further study.
Consider development of an ordinance for energy and water efficiency standards for transfer of title transactions	This strategy is not applicable to local development as it is a City-sponsored program designated for further study.
Transportation	
Consider amending the City's General Plan to include new sustainability policies, goals and programs	These strategies are designated for further study and would be City-sponsored policies, goals and programs that are not developed at this time and therefore not applicable to the Project.
Consider social marketing programs/ campaigns to promote alternative transportation (walking, biking, public transit, etc.)	This strategy is not applicable to local development as it is a City-sponsored education program designated for further study. The Project's TDM program already includes this.

Table 3.5-6. Climate Action Plan Strategies to be Implemented at the Community Level

CAP Strategies	Project Compliance
Consider implementation for City Car Sharing Program	The Project would have parking spaces available for the implementation of car share programs.
Implement Bike Improvements	The Project would include bicycle storage facilities and showers and changing rooms.
Solid Waste	
Consider adopting a Zero Waste Policy with 75 percent diversion by 2020 and 90 percent diversion by 2030.	These strategies are designated for further study and would be City-sponsored infrastructure and/or ordinance efforts to reduce solid waste disposal that would not be applicable to a land use project.
Consider adopting a mandatory Commercial Recycling Ordinance	These strategies are designated for further study and would be City-sponsored infrastructure and/or ordinance efforts to reduce solid waste disposal that would not be applicable to a land use project. The Project would recycle 50 percent of its office waste and compose the food waste. In addition, the Project would recycle approximately 75 percent of all debris resulting from demolition and excavation activities during construction.
Other	
Establish Climate Action Plan monitoring and progress reporting program	These strategies are designated for further study and would be City-sponsored policies, goals, and programs that are not applicable to the Project.
Expand Green Business Certification Program/Include Green Business education to new business permit applicants	This strategy is not applicable to local development as it is a City-sponsored education program designated for further study.
Consider amending the City's General Plan to include a "GHG Reduction Strategy" as outlined in the new CEQA Guidelines	These strategies are designated for further study and would be City sponsored policies, goals and programs that are not developed at this time and therefore not applicable to the Project.
Develop social marketing campaign to educate residents on reducing their personal greenhouse gas emissions.	This strategy is not applicable to local development as it is a City sponsored education program designated for further study.
Develop a promotion and education program to encourage local and or organic food production	This strategy is not applicable to local development as it is a City sponsored education program designated for further study.

Table 3.5-6. Climate Action Plan Strategies to be Implemented at the Community Level

CAP Strategies	Project Compliance
Consider an educational program and/or local ordinance to limit vehicle idling	This strategy is not applicable to local development as it is a City-sponsored program and ordinance designated for further study. Additionally, the ARB has already implemented a heavy-duty truck idling emission reduction program that restricts truck idling to five minutes.
Research opportunities to improve methane capture at Marsh Road Landfill (Methane Emissions Mitigation)	These strategies are designated for further study and would be City-sponsored infrastructure and/or ordinance efforts to reduce emissions from solid waste disposal at a specific facility that would not be applicable to a land use project.

Source: City of Menlo Park. 2011. Climate Action Plan Assessment Report. July, Available: http://www.menlopark.org/departments/env/Menlo_CAP_Assessment_Report_2010_12_14_draft_final_final6.pdf. Accessed: October 2013; ICF 2013.

The Project would not conflict with any applicable plans or policies that do not require speculation as to future emission reductions that could occur based on technologies not yet developed. Therefore, the Project's impact relative to conflicts with applicable plans and policies would be ***less than significant***.

Impact GHG-4: Exposure of Property and People to Climate Change. The Project would not result in the exposure of property and persons to the physical effects of climate change, including flooding, public health, and wildfire risk. (LTS)

As discussed earlier under *Predicted Effect of Climate Change*, several impacts on the environment are expected throughout California as a result of global climate change. The extent of these effects is still being defined as climate modeling tools become more refined. Regardless of the uncertainty in precise predictions, it is widely understood that substantial climate change is expected to occur in the future. As discussed above, potential climate change impacts in California and the Bay Area include sea level rise, extreme heat events, increased energy consumption, increase in infectious diseases and respiratory illnesses, reduced snowpack and water supplies, increased water consumption, and potential increase in wildfires.

The Project site is located in an area subject to future sea level rise inundation. According to the National Oceanic and Atmospheric Administration (NOAA) online Sea Level Rise and Coastal Flooding Impact Viewer,[52] and maps available from the BCDC,[53] the northern portion of the Jefferson Site would potentially be subject to inundation with an expected mid-century sea level rise (1.3 and 1.57 feet by 2050). The buildings at the Commonwealth Site would not be subject to mid-century sea level rise.

[52] NOAA. 2013. Sea Level Rise and Coastal Flooding Impact Viewer. Accessed: October 28, 2013. Available: http://csc.noaa.gov/digitalcoast/tools/slrviewer.

[53] San Francisco Bay Conservation and Development Commission. 2007. San Francisco Bay Scenarios for Sea Level Rise Index Map. Available: http://www.bcdc.ca.gov/planning/climate_change/index_map.shtml. Accessed: April 16, 2013.

In addition to sea level rise, a range of other potential climate change impacts may affect the Project, including increased temperatures and heat stress days. However, the Project would not exacerbate these issues; rather, energy efficient building materials associated with the Project could reduce potential heat-related climate change impacts on employees. Likewise, while regional water supplies are subject to potential future climate change effects that could impact water supplies, the Project includes water-efficiency measures that would help alleviate demand for scarce statewide water resources. The Project would provide landscaping throughout the Project site with a variety of shade trees planted in the surface parking lot, which would also help reduce the heat island effect that may be exasperated by the increased frequency of heating days due to climate change.

As identified above, although the Project site could potentially be affected by the projected sea level rise from mid-century to the end of century, it is unknown if the Project would be in existence at this time. Moreover, the Project would incorporate designs to reduce exposure of property or persons to the potential effects of climate change. Consequently, the impact of climate change on the Project is considered ***less than significant***.

Cumulative Impacts

GHGs and climate change are exclusively cumulative impacts, and there is no non-cumulative GHG emission impact from a climate change perspective.[54] Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors), which are primarily pollutants of regional and local concern. GHGs are emitted by countless sources worldwide, accumulate in the atmosphere and have long atmospheric lifetimes. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Therefore, GHG impacts are inherently cumulative. In accordance with scientific consensus regarding the cumulative nature of GHGs, the analysis above considers the cumulative contribution of project-related GHG emissions and no additional cumulative impact analysis has been provided.

[54] California Air Pollution Control Officers Association. 2008. CEQA & Climate Change. January. Available: <http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA-White-Paper.pdf>. Accessed: January 10, 2014.