

## 4.3 GREENHOUSE GAS EMISSIONS

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### A. INTRODUCTION

This section addresses the greenhouse gas (GHG) emissions generated by construction and operation of the proposed Project. The analysis also addresses the consistency of the proposed Project with the policies of the Southern California Association of Governments (SCAG) and the City of Pasadena that are intended to reduce GHG emissions. Calculation worksheets, assumptions, and model outputs used in the analysis are included in **Appendix C** of this Draft EIR.

### B. ENVIRONMENTAL SETTING

#### 1. Greenhouse Gases and Climate Change

##### *a. Global Context*

GHGs are global pollutants that have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere for a long enough time to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule depends on multiple variables and cannot be pinpointed, more carbon dioxide (CO<sub>2</sub>) is currently emitted into the atmosphere than is sequestered. CO<sub>2</sub> sinks, or reservoirs, include vegetation and the ocean, which absorb CO<sub>2</sub> through photosynthesis and dissolution, respectively. These are two of the most common processes of CO<sub>2</sub> sequestration. Of the total annual human-caused CO<sub>2</sub> emissions, approximately 54 percent is sequestered through ocean uptake, northern hemisphere forest regrowth, and other terrestrial sinks within a year, whereas the remaining 46 percent of human-caused CO<sub>2</sub> emissions is stored in the atmosphere.

Similarly, effects of GHGs are borne globally, as opposed to localized air quality effects of criteria air pollutants and toxic air contaminants (TACs). The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; but that quantity is enormous, and no single project would be expected to measurably contribute to a noticeable incremental change in the global average temperature, or to a global, local, or microclimate.

GHGs with lower emissions rates than CO<sub>2</sub> may still contribute to climate change because they are more effective at absorbing outgoing infrared radiation than CO<sub>2</sub>. The concept of CO<sub>2</sub> equivalency (CO<sub>2</sub>e) is used to account for the different potentials of GHGs to absorb infrared radiation. This potential, known as the global warming potential (GWP) of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

However, emissions of methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) are generally much lower than those of CO<sub>2</sub>, and are associated with anaerobic microbial activity resulting from agricultural practices, flooded soils, and landfills. CH<sub>4</sub> and N<sub>2</sub>O have approximately 23 and 296 times the GWP of CO<sub>2</sub>, respectively.

**b. Greenhouse Effect**

GHGs play a critical role in determining the earth's surface temperature because these gases absorb solar radiation. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. The radiation absorbed by the earth is reradiated as lower-frequency infrared radiation, which is then selectively absorbed by GHGs in the earth's atmosphere. As a result, the greater the amount of GHGs in the atmosphere, the greater the amount of infrared radiation trapped, resulting in a warming of the atmosphere. This phenomenon is commonly referred to as the "greenhouse effect." Human activity has resulted in increased emissions of GHGs, primarily from the burning of fossil fuels (from motor vehicle travel, electricity generation, consumption of natural gas, industrial activity, manufacturing, etc.), deforestation, agricultural activity, and the decomposition of solid waste. Scientists refer to the global warming context of the past century as the "enhanced greenhouse effect" to distinguish it from the natural greenhouse effect.<sup>1</sup>

**c. Climate Change Effects for California**

Climate change could affect environmental conditions in California in a variety of ways. One effect of climate change is sea level rise. Sea levels along the California coast rose approximately 7 inches during the last century and are predicted to rise an additional 31–55 inches by 2100, depending on the future levels of GHG emissions.<sup>2</sup> Effects of sea level rise could include increased coastal flooding, saltwater intrusion (especially a concern in the low-lying Sacramento–San Joaquin Delta, where pumps delivering potable water to Southern California could be threatened), and disruption of wetlands.

As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the State if suitable

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1 Pew Center on Global Climate Change and the Pew Center on the States, *Climate Change 101: Understanding and Responding to Global Climate Change* (updated January 2011).

2 California Energy Commission, Climate Change Center, *Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California*, CEC-500-2012-007 (July 2012).  
<http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>.

conditions are no longer available. Additional concerns associated with climate change are a reduction in the snowpack, leading to less overall water storage in the mountains (the largest “reservoir” in the State), and increased risk of wildfire caused by changes in rainfall patterns and plant communities.

**d. Sources of Greenhouse Gas Emissions**

Land use decisions and future development projects pursuant to implementation of a general plan can affect the generation of GHG emissions from multiple sectors, resulting in direct or indirect GHG emissions. For example, electricity consumed in structures would indirectly cause GHGs to be emitted at a power plant. Residents, employees, shoppers, and visitors drive vehicles that generate GHG emissions, which are part of the transportation sector. Emissions of CO<sub>2</sub> are byproducts of fossil-fuel combustion and are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors.

**2. Existing Greenhouse Gas Emissions**

**a. State of California Emissions**

California is the second largest contributor of GHGs in the United States and the 16th largest in the world.<sup>3</sup> In 2014, California produced 441.54 million metric tons of carbon dioxide equivalents (MMTCO<sub>2</sub>e), including imported electricity and excluding combustion of international fuels and carbon sinks or storage. The largest source of GHGs in California is transportation, contributing to 36 percent of the State’s total GHG emissions. Industrial generation is the second largest source, contributing to 21 percent of the State’s GHG emissions. The Statewide inventory of GHGs by sector is shown in **Table 4.3-1, California GHG Inventory 2006–2014**.

**b. Existing Operational Emissions**

The Project Site is developed with existing multifamily residential structures. The estimated operational GHG emissions are based on the existing development within the Project Site and are presented in **Table 4.3-2, Existing Operational GHG Emissions**. The most current California Air Resources Board (CARB)-approved, South Coast Air Quality Management District (SCAQMD)-recommended modeling software, the California Emissions Estimator Model (CalEEMod), was used to estimate existing GHG operation generation.

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3 California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*, staff final report, CEC-600-2006-013-SF (December 2006).

**Table 4.3-1**  
**California GHG Inventory 2006–2014**

Main Sector	Emissions (MMTCO <sub>2</sub> e)								
	2006	2007	2008	2009	2010	2011	2012	2013	2014
Transportation <sup>a</sup>	184.13	184.17	172.99	166.16	162.78	159.47	159.47	157.99	159.53
Industrial <sup>b</sup>	92.94	89.71	90.18	87.70	90.99	90.49	90.63	93.10	93.22
Electric power	104.53	113.93	120.14	101.37	90.34	88.06	95.09	59.65	88.24
Commercial and residential	42.94	43.15	43.52	43.63	45.05	45.51	42.75	43.40	38.34
Agriculture	35.61	36.20	36.37	34.06	34.92	35.85	36.78	35.36	36.11
High GWP <sup>c,d</sup>	8.31	8.95	9.90	10.92	12.39	13.65	14.89	16.05	17.15
Recycled and waste	8.03	8.12	8.30	8.47	8.58	8.69	8.72	8.76	8.85
Total Emissions	476.50	484.23	481.41	452.32	445.05	441.71	448.33	444.31	441.54

Source: CARB (2016), [https://www.arb.ca.gov/cc/inventory/data/tables/ghg\\_inventory\\_scopingplan\\_2000-14.pdf](https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_2000-14.pdf).

<sup>a</sup> Includes equipment used in construction, mining, oil drilling, industrial and airport ground operations.

<sup>b</sup> Reflects emissions from combustion of natural gas, diesel, and lease fuel plus fugitive emissions.

<sup>c</sup> These categories are listed in the Industrial sector of CARB's GHG Emission Inventory sectors.

<sup>d</sup> This category is listed in the Electric Power sector of CARB's GHG Emission Inventory sectors.

**Table 4.3-2**  
**Existing Operational GHG Emissions**

GHG Emission Source	Emissions (MTCO <sub>2</sub> e/year)
Operational (mobile)	1,622.8
Area	40.1
Energy	735.2
Waste	41.6
Water	193.5
Total	2,633.2

Source: Refer to **Appendix C1** (Existing Annual).

## C. REGULATORY FRAMEWORK

### 1. State

#### a. *Assembly Bill 1493*

California Assembly Bill (AB) 1493 (Pavley), enacted on July 22, 2002, requires the CARB to adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. The CARB estimates that the regulation would reduce climate change emissions from the light-duty passenger vehicle fleet by

an estimated 18 percent in 2020 and by 27 percent in 2030.<sup>4</sup> On June 30, 2009, the US Environmental Protection Agency granted a waiver of Clean Air Act preemption to California for the State's GHG emission standards for motor vehicles beginning with the 2009 model year.

**b. *Executive Order S-3-05 and the Climate Action Team***

Executive Order (EO) S-3-05, which was signed by then governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the EO established the following total GHG emission targets:

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

The 2050 reduction goal represents what scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be an aggressive but achievable midterm target. To meet these targets, the governor directed the secretary of the California Environmental Protection Agency to lead a Climate Action Team made up of representatives from the Business, Transportation and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the CARB; the Energy Commission; and the Public Utilities Commission. The 2006 *Climate Action Team Report to Governor Schwarzenegger and the Legislature* contains recommendations and strategies to help ensure the targets in EO S-3-05 are met.<sup>5</sup>

**c. *Executive Order S-01-7***

Governor Schwarzenegger signed EO S-01-07 on January 18, 2007. The order mandated that a Statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also established a Low Carbon Fuel Standard (LCFS) for transportation fuels for California. The LCFS requires that the life-cycle of GHG emissions for the mix of fuels sold in California declines on average. Each fuel provided may meet the standard by selling fuel with lower carbon content,

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4 California Air Resources Board (CARB), *Climate Change Emission Control Regulations*, fact sheet (December 10, 2004).

5 State of California, Environmental Protection Agency, Climate Action Team, *Climate Action Team Report to Governor Schwarzenegger and the California Legislature*, [http://www.climatechange.ca.gov/climate\\_action\\_team/reports/index.html#catreports](http://www.climatechange.ca.gov/climate_action_team/reports/index.html#catreports) (March 2006). Accessed July 10, 2014.

using previously banked credits from selling fuel that exceeded the LCFS, or purchasing credit from other fuel providers who have earned credits. The reduction goal of 10 percent is expected to help meet other state goals such as AB 32, the Bioenergy Action Plan, and the CEC's 2003 Integrated Energy Policy Report.

**d. California Air Resources Board**

On October 24, 2008, the CARB released the first preliminary draft of recommended approaches for setting interim significance thresholds for GHGs under the California Environmental Quality Act (CEQA). The draft approach seeks to establish GHG thresholds and/or performance standards based on sector types, as defined in the 2008 Scoping Plan. Sectors identified in the 2008 Scoping Plan are transportation, electricity, industrial, commercial and residential, agricultural, high global warming potential, and recycling and waste. CARB has not yet finalized the proposed thresholds/performance standards.

**e. Assembly Bill 32**

In 2006, the California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 focuses on reducing GHG emissions in California. GHGs, as defined under AB 32, include CO<sub>2</sub>, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. CARB is the State agency charged with monitoring and regulating sources of emissions of GHGs that cause global warming as part of an effort to reduce emissions of GHGs.

The CARB Governing Board approved the 1990 GHG emissions level of 427 MMTCO<sub>2</sub>e on December 6, 2007. Therefore, by 2020, emissions in California are required to be at or below 427 MMTCO<sub>2</sub>e. Under the current "business as usual" (BAU) scenario, Statewide emissions are increasing at a rate of approximately 1 percent per year as noted below.

- 1990: 427 MMTCO<sub>2</sub>e
- 2004: 480 MMTCO<sub>2</sub>e
- 2008: 495 MMTCO<sub>2</sub>e
- 2020: 596 MMTCO<sub>2</sub>e

Under AB 32, the CARB published its *Final Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California*.<sup>6</sup> The CARB has 44 early action measures that apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. Of those early action measures, nine are considered discrete early action measures because they were adopted by the CARB and enforceable by January 1, 2010.<sup>7</sup> The CARB estimates that the 44 early action measures will result in reductions of at least 42 MMTCO<sub>2e</sub> by 2020, representing approximately 25 percent of the 2020 target.

CEQA is only discussed once in the Early Action Measures report. The California Air Pollution Control Officer's Association (CAPCOA) suggested that CARB work with local air districts on approaches to review GHG impacts under the CEQA process, including significance thresholds for GHGs for projects, and to develop a process for capturing reductions that result from CEQA mitigations. CARB's response to this recommendation in the report is as follows:

*The Governor's Office of Planning and Research is charged with providing statewide guidance on CEQA implementation. With respect to quantifying any reductions that result from project-level mitigation of GHG emissions, we would like to see air districts take a lead role in tracking such reductions in their regions.*<sup>8</sup>

The CARB approved the Climate Change Proposed Scoping Plan ("Scoping Plan") in December 2008. The Scoping Plan

*proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health.*<sup>9</sup>

As noted in the approved 2008 Scoping Plan, the projected total BAU emissions for year 2020 (estimated as 506.8 MMTCO<sub>2e</sub>) must be reduced by approximately 16 percent to achieve the CARB's approved 2020 emission target of 427 MMTCO<sub>2e</sub>. CARB updated the 2008 Scoping Plan in May 2014 ("Updated 2014 Scoping Plan").<sup>10</sup> The Updated 2014 Scoping Plan adjusted the 1990 GHG emissions level to 431

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6 CARB, *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration* (October 2007), [http://www.arb.ca.gov/cc/ccea/meetings/ea\\_final\\_report.pdf](http://www.arb.ca.gov/cc/ccea/meetings/ea_final_report.pdf). Accessed July 6, 2014.

7 Discrete early actions are regulations to reduce GHG emissions adopted by the CARB Governing Board and enforceable by January 1, 2010.

8 CARB, *Expanded List of Early Action Measures* (October 2007).

8 CARB, *Expanded List of Early Action Measures* (October 2007).

9 CARB, *Climate Change Scoping Plan: A Framework for Change* (December 2008), [http://www.arb.ca.gov/cc/scopingplan/document/adopted\\_scoping\\_plan.pdf](http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf). Accessed June 10, 2013.

10 CARB, *First Update to the Climate Change Scoping Plan* (May 2014).

MMTCO<sub>2e</sub>, while the updated 2020 GHG emissions forecast is 509 MMTCO<sub>2e</sub>, which took credit for certain GHG emission reduction measures already in place (e.g., the Renewable Portfolio Standard). As revised in 2014, the projected total BAU emissions for year 2020 must be reduced by approximately 15 percent to achieve the CARB's approved 2020 emission target of 431 MMTCO<sub>2e</sub>. The Updated 2014 Scoping Plan also recommend a 40 percent reduction in GHG emissions from 1990 levels by 2030 and a 60 percent reduction in GHG emissions from 1990 levels by 2040. In 2016, the Legislature passed Senate Bill (SB) 32, which codifies a 2030 GHG emissions reduction target of 40 percent below 1990 levels. With SB 32, the Legislature passed companion legislation AB 197, which provides additional direction for developing the Scoping Plan. ARB is moving forward with a second update to the Scoping Plan to reflect the 2030 target set (EO B-30-15 and codified by SB 32).

The 2008 Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the 2008 Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

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

In addition, the Scoping Plan differentiates between “capped” and “uncapped” strategies. “Capped” strategies are subject to the proposed cap-and-trade program.<sup>11</sup> The 2008 Scoping Plan states that the inclusion of these emissions within the cap-and-trade program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. “Uncapped” strategies include additional reductions that will not be subject to the cap-and-trade emissions requirements. They are provided as a margin of safety to help achieve required GHG emission reductions.

**f. Senate Bill 32**

On September 8, 2016, Governor Brown enacted SB 32, which extends AB 32 another 10 years to 2030 and increases the State’s objectives. SB 32 calls for Statewide reductions in GHG emissions to 40 percent below 1990 levels by 2030.

**g. Assembly Bill 197**

On September 8, 2016, Governor Jerry Brown enacted AB 197, which requires ARB to approve a statewide GHG emissions limit equivalent to the statewide GHG emission level in 1990 to be achieved by 2030. SB 32 requires ARB to prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions.

**h. Title 24 Energy Efficiency Standards**

Although not originally intended to reduce GHGs, California Code of Regulations, Title 24, Part 6: California’s Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California’s energy consumption. Since then, Title 24 has been amended with for the view of creating energy-efficient buildings that require less electricity and reduce fuel consumption, which in turn decreases GHG emissions. The 2013 Title 24 standards were adopted to respond, among other reasons, to the requirements of AB 32. The 2013 Building Energy

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11 The cap-and-trade program is a central element of AB 32 and covers major sources of GHG emissions in the State, such as refineries, power plants, industrial facilities, and transportation fuels. The regulation includes an enforceable GHG cap that will decline over time. CARB will distribute allowances, which are tradeable permits, equal to the emission allowed under the cap.

Efficiency Standards focused on several key areas to improve energy efficiency of newly constructed buildings and additions and alterations to existing buildings, and included requirements that would enable both demand reductions during critical peak periods and future solar electric and thermal system installations.<sup>12</sup> Specifically, new development projects constructed within California are subject to the mandatory planning and design, energy efficiency, water efficiency and conservation, material conservation and resources efficiency, and environmental quality measures of the California Green Building Standards (“CALGreen”) Code (California Code of Regulations, Title 24, Part 11).

California’s Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2016 update to the Building Energy Efficiency Standards again focuses on several key areas to improve the energy efficiency of both new and existing. The most significant efficiency improvements to the residential Standards include improvements for attics, walls, water heating, and lighting. The most significant efficiency improvements to the nonresidential Standards include alignment with the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 90.1 2013 national standards.<sup>13</sup> The 2016 Standards became effective on January 1, 2017.

## **2. Regional**

### **a. *Southern California Association of Governments’ Sustainable Communities Strategy***

The City of Pasadena is a member agency of the Southern California Association of Governments (SCAG). To fulfill its commitments as a metropolitan planning organization under the Sustainable Communities and Climate Protection Act, SCAG adopted the 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (“2016 RTP/SCS”). The 2016 RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. It is designed to reduce GHG emissions from passenger vehicles by 8 percent per capita by 2020, 13 percent per capita by 2035, and 21 percent per capita by 2040 when compared to 2005, exceeding the reductions that CARB currently requires. The 2016 RTP/SCS reaffirms the land use policies that were incorporated into the 2012–2035 RTP/SCS.

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12 California Energy Emission, *2013 Building Energy Efficiency Standards for Residential and Nonresidential Buildings*, CEC-400-2012-004-CMF-REV2 (May 2012). <http://www.energy.ca.gov/2012publications/CEC-400-2012-004/CEC-400-2012-004-CMF-REV2.pdf>.

13 California Energy Commission, *2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings*, CEC-400-2015-037 (June 2015), <http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf>.

SCAG is supporting several local governments throughout the region in the formation of Climate Action Plans (CAPs). In general, CAPs outlines strategies for reducing GHGs emissions in a cost-effective manner. Strategies outlined by CAPs in the SCAG region include designing green building guidelines for municipal buildings and facilities; implementing public electric-vehicle charging stations; and establishing energy retrofit incentive programs for residents.

**b. South Coast Air Quality Management District**

The Project is located in the South Coast Air Basin (“Air Basin”), which consists of Orange County, Los Angeles County (excluding the Antelope Valley portion), and the western nondesert portions of San Bernardino and Riverside Counties, in addition to the San Gorgonio Pass area in Riverside County. The SCAQMD is responsible for air quality planning in the Air Basin and for developing rules and regulations to bring the area into attainment of the ambient air quality standards. This is accomplished through air quality monitoring, evaluation, education, implementation of control measures to reduce emission from stationary sources, permitting and inspection of pollution sources, and enforcement of air quality regulations, as well as by supporting and implementing measures to reduce emissions from motor vehicles.

The SCAQMD adopted its “Policy on Global Warming and Stratospheric Ozone Depletion” on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the Air Quality Management Plan. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- Phase out the use and corresponding emissions of chlorofluorocarbons, methyl chloroform (1,1,1--trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- Phase out the large quantity use and corresponding emissions of hydrochlorofluorocarbons by the year 2000;
- Develop recycling regulations for hydrochlorofluorocarbons (e.g., SCAQMD Rules 1411 and 1415);
- Develop an emissions inventory and control strategy for methyl bromide; and
- Support the adoption of a California GHG emission reduction goal. In April 2008, SCAQMD convened a “GHG CEQA Significance Threshold Working Group” (“Working Group”) to provide guidance to local lead agencies on determining the significance of GHG emissions identified in CEQA documents.<sup>14</sup>

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15 CARB, *Greenhouse Gases (CEQA) Significance Thresholds*, <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds>.

In December 2008, SCAQMD staff presented the SCAQMD Governing Board with a significance threshold for commercial/residential projects that uses a tiered approach to determine a project's significance, with 3,000 metric tons per year of carbon dioxide equivalent (MTCO<sub>2</sub>e) as a screening numerical threshold. However, the SCAQMD has yet to formally adopt a GHG significance threshold for land use development projects (e.g., residential/commercial projects) and has formed a GHG Significance Threshold Working Group to further evaluate potential GHG significance thresholds.<sup>15</sup> The aforementioned Working Group was inactive from 2011 through 2016 and the SCAQMD has not formally adopted any GHG significance threshold for land use development projects such as the one analyzed in this Draft EIR.

In the latest guidance provided by the Working Group in September 2010, SCAQMD considered a tiered approach to determine the significance of residential and commercial projects. The draft-tiered approach is outlined in the meeting minutes dated September 29, 2010.<sup>16</sup> The tiers are as follows:

**Tier 1:** Applies if the project is exempt from further environmental analysis under existing statutory or categorical exemptions, there is a presumption of less than significant impacts with respect to climate change. If not, then the Tier 2 threshold should be considered.

**Tier 2:** Consists of determining whether or not the project is consistent with a GHG reduction plan that may be part of a local general plan, for example. The concept embodied in this tier is equivalent to the existing concept of consistency in the State CEQA Guidelines subsection 15064(h)(3), 15125(d), or 15152(a). Under Tier 2, if the proposed project is consistent with the qualifying local GHG reduction plan, it is not significant for GHG emissions. If there is not an adopted plan, then a Tier 3 approach would be appropriate.

**Tier 3:** Establishes a screening significance threshold level to determine significance. The Working Group provided a recommendation of 3,000 MTCO<sub>2</sub>e tons per year for residential projects.

**Tier 4:** Requires a more detailed review of the project's GHG emissions if the emissions exceed the Tier 3 screening threshold.

SCAQMD has identified an efficiency target for projects that exceed the screening threshold. The current recommended approach is per capita efficiency targets. SCAQMD is not recommending use of a

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15 CARB, *Greenhouse Gases (CEQA) Significance Thresholds*, <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds>.

17 City of Pasadena Planning & Development Department, *Green City Action Plan* (2006). Available at <http://cityofpasadena.net/GreenCity/>.

percentage emissions-reduction target. Instead, SCAQMD identified a 2020 efficiency target of 4.8 MTCO<sub>2</sub>e per year per service population (MTCO<sub>2</sub>e/year/SP) for project-level analyses and 6.6 MTCO<sub>2</sub>e/year/SP for plan-level projects (e.g., general plans). Service population is defined as the sum of the residential and employment populations provided by a project.

### 3. Local

#### a. *City of Pasadena Green City Action Plan*

The City of Pasadena developed an Action Plan<sup>17</sup> to create a more sustainable City capable of meeting growing demand and reducing impacts to natural resources. There are seven focus areas within the plan: (1) energy; (2) waste reduction; (3) urban design; (4) urban nature; (5) transportation; (6) environmental health; and (7) water. The Action Plan contains a wide range of initiatives, goals, and policies to conserve energy and water, reduce waste, address global warming, tailor urban design, protect natural habitats, improve transportation options, and reduce risks to human health.

#### b. *City of Pasadena Green Building Ordinance*

The proposed Project is a nonresidential building that encompasses more than 25,000 square feet of new construction and is therefore subject to the mandatory Tier 1 CALGreen standards as part of Pasadena's Green Building Ordinance.<sup>18</sup> Compliance with Pasadena's Green Building Practices Ordinance under the City's Tier 1 standards (as amended) would result in a 20 percent increase in building (Title 24) energy efficiency compared to the 2008 Building and Energy Efficiency Standards.<sup>19</sup> The City also requires compliance with prerequisite and elective measures to achieve an equivalent 40 Leadership in Energy and Environmental Design (LEED) points. The City's mandatory Green Building Ordinance's prerequisite and elective measures include:

- Designated parking requirements encompassing a minimum of 10 percent of parking capacity for fuel-efficient vehicles;
- Roofing materials with a high solar reflectance index (i.e., cool roofs);
- Water-efficient landscaping that achieves a 50 percent reduction in landscape irrigation water use;
- Low-flow fixtures that achieve a 20 percent reduction in indoor water use; and

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17 City of Pasadena Planning & Development Department, *Green City Action Plan* (2006). Available at <http://cityofpasadena.net/GreenCity/>.

18 City of Pasadena Municipal Code, ch. 14.04, Green Building Standards Code, sec. 14.04.504.

19 City of Pasadena Municipal Code, sec. 14.04.540.

- Construction and demolition debris diversion of 65 percent from landfills for recycling, reuse, or recovery.

## D. ENVIRONMENTAL IMPACTS

### 1. Methodology

A quantified estimate of GHG emissions was prepared using the CARB-approved CalEEMod 2016.3.1 computer program, as recommended by the SCAQMD. Project-generated emissions were modeled based on general information provided in the Project description and using SCAQMD-recommended and default CalEEMod model settings to estimate reasonable worst-case conditions. CalEEMod utilizes emissions factors from the Climate Registry, which complies data of construction and operations emissions of carbon dioxide, among other air pollutants. Project-generated emissions were modeled based on proposed land uses and general information provided in **Section 2.0, Project Description**.

The following assumptions for the proposed Project were made in the CalEEMod computer program:

#### a. Land Use

- Construction of 307 mid-rise apartments (dwelling units)
- Construction of a 521-space enclosed parking structure
- Demolition of existing structures

#### b. Construction

Information needed to parameterize the Project in CalEEMod was obtained from the Applicant. Construction of the Project is anticipated to begin July 2018 and last approximately 2 years. **Table 4.3-3, Project Construction Schedule**, lists the construction phases and duration of each of the activities that will be take place during construction, as well as a brief description of the scope of work. These dates represent approximations based on the general Project timeline and are subject to change pending unpredictable circumstances that may arise. In addition, **Table 4.3-3** lists the varying levels of intensity and number of construction personnel. Construction traffic is generated by the hauling of exported soil, vendor deliveries of construction materials, and construction worker daily trips to the Project Site.

An assessment of GHG emissions was prepared utilizing the construction schedule in **Table 4.3-3** and design features obtained from the Project Applicant. It was assumed that all construction activities would adhere to SCAQMD Rule 403 (Fugitive Dust) and Rule 1113 (Architectural Coatings).

**Table 4.3-3  
Project Construction Schedule**

<b>Construction Phase</b>	<b>Duration</b>	<b>Worker Trips (per day)</b>	<b>Total Vendor/ Hauling Trips (per phase)</b>	<b>Description</b>
Demolition	5 to 6 weeks	15	24	Demolition of approximately 240 tons of existing material
Site Preparation	1 week	18	—	Clearing of debris and preparation for grading
Grading	7 to 8 weeks	100	11,000	Export of 88,000 cubic yards of soil
Building Construction	14 months	309	67	Construction of foundation and structure for apartment building and parking garage
Paving	1 month	20	—	Paving of asphalt surfaces
Architectural Coating	3 months	62	—	Application of architectural coatings to building materials and parking facilities

Source: Refer to **Appendix C, Section 3.0—Construction Detail**.

Note: Architectural coating will be taking place intermittently throughout the latter stages of building construction.

### **c. Vehicle Miles Traveled per Capita**

Automobiles are a primary source of GHG emissions. Vehicle Miles Traveled (VMT) is a measure of automobile use. As stated in SCAG’s 2016 RTP/SCS, “Automobiles and light duty trucks are a major contributor to greenhouse gas emissions, producing more than 60 percent of transportation sector emissions. Therefore, VMT reduction is a critical component of a comprehensive regional strategy for reducing greenhouse gas emissions.”<sup>20</sup> Project VMT analyses are based on the City’s Transportation Impact Analysis using the City’s calibrated travel demand forecasting model (TDF), that was built on SCAG’s regional model. The VMT per capita measure sums the miles traveled for trips within the TDF. The VMT total considers 100 percent of the mileage of trips that begin and end inside Pasadena and 50 percent of the distance traveled for trips with one end outside of Pasadena. The City’s VMT is then divided by the City’s total service population, defined as the population (136,165) plus the number of jobs (111,348).

## **2. Thresholds of Significance**

The Project is considered to have a significant impact to GHG emissions if it would:

20 Southern California Association of Governments, *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy*, p. 8-160.

**Threshold 4.3-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.**

**Threshold 4.3-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.**

Although the SCAQMD adopted a quantitative significance threshold for industrial (stationary source) projects, it did not adopt thresholds for residential or commercial projects. At its last meeting in September 2010, the Working Group proposed a tiered approach, as discussed above, for assessing GHG significance. For Tier 3 (Screening Values), the Working Group proposed establishing a quantitative threshold of 3,000 MTCO<sub>2e</sub>/year for all residential or commercial land use projects. It also proposed threshold values by land use, but only if used consistently. If projects exceed the screening value as provided in Tier 3, SCAQMD identified an efficiency target of 4.8 MTCO<sub>2e</sub>/year/SP for project level analyses.

In its January 2008 CEQA and Climate Change white paper, CAPCOA identified a number of potential approaches for determining the significance of GHG emissions in CEQA documents. CAPCOA suggests making significance determinations on a case-by-case basis when no significance thresholds have been formally adopted by a lead agency. Although GHG emissions can be quantified, CARB, SCAQMD, and the City of Pasadena have yet to adopt project-level significance thresholds for GHG emissions that would be applicable to the Project. Assessing the significance of a project's contribution to cumulative global climate change involves (1) evaluating the project's sources of GHG emissions; and (2) considering project consistency with applicable emission reduction strategies and goals, such as those set forth by the lead agency or other regional or State agency.

Local and regional agencies and the State recommended general policies and measures to minimize and reduce GHG emissions from land use development projects. Thus, if the Project were designed in accordance and not in conflict with applicable policies and measures, it would result in a less than significant impact because it would be consistent with the strategies and actions to reduce GHG emission.

### **3. Project Impacts**

**Threshold 4.3-1: Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?**

#### **Construction**

The current accepted method for accounting for the construction GHG emissions within the SCAQMD service area is to annualize these emissions over a project's operational lifetime, which is generally defined as 30 years for analysis purposes. A summary of the GHG emissions for the construction phases

is provided in **Table 4.3-4, Construction GHG Emissions**. As shown below, total construction emissions would be approximately 2,287.9 MTCO<sub>2</sub>e. Construction emissions amortized over 30 years would be approximately 76.3 MTCO<sub>2</sub>e/year. Per SCAQMD, the amortized construction emissions are included in the operational impacts as shown in **Table 4.3-5, Estimated Greenhouse Gas Emissions**.

**Table 4.3-4  
Construction GHG Emissions**

Year	CO <sub>2</sub> e Emissions (Metric Tons per Year)
2018	617.4
2019	1,165.2
2020	505.3
<b>Total Construction GHG Emissions</b>	<b>2,287.9</b>
<b>Annualized over Project's Lifetime</b>	<b>76.3</b>

Source: Refer to **Appendix C4 (Annual)**, Section 2.1—Overall Construction.

## Operation

The GHG emissions from operation of the Project involves the usage of on-road mobile vehicles, electricity, natural gas, water, landscape equipment, hearth combustion, and the generation of solid waste and wastewater. The annual net GHG emissions associated with the operation of the Project are provided in **Table 4.3-5**. The sum of the direct and indirect emissions associated with the Project is compared with SCAQMD's screening threshold of 3,000 MTCO<sub>2</sub>e/year. As shown in **Table 4.3-5**, the net increase in GHG emissions generated by the Project would be 1,354.3 MTCO<sub>2</sub>e per year, below the SCAQMD-recommended Tier 3 screening threshold for residential projects of 3,000 MTCO<sub>2</sub>e per year. In addition, the Project would have a net increase of 325 residents. As such, the per service population emissions would equal to 4.2 MTCO<sub>2</sub>e per capita annually, below the SCAQMD-recommended Tier 4 2020 efficiency target of 4.8 MTCO<sub>2</sub> per year per service population.

**Table. 4.3-5  
Estimated Greenhouse Gas Emissions**

<b>GHG Emissions Source</b>	<b>Emissions (MTCO<sub>2</sub>e/year)</b>
Construction (amortized)	76.3
Operational (mobile)	1,474.0
Area	68.3
Energy	2,072.4
Waste	17.8
Water	278.7
<b>Total</b>	<b>3,987.5</b>
<i>Existing</i>	<i>(2,633.2)</i>
<b>Net total</b>	<b>1,354.3</b>
<b>Per Service Population (Net increase of 325 residents)</b>	<b>4.2</b>

\* N<sub>2</sub>O emissions account for 0.06 MTCO<sub>2</sub>e/year.

Source: Refer to **Appendix C1** (Existing Annual) and **Appendix C4** (Annual).

### **VMT Per Capita**

Additionally, as stated above, VMT reduction is an essential part of reducing greenhouse gas emissions. Change in VMT per capita is indicative of a change in automobile emissions per capita. Although total VMT will likely increase with the addition of new residents, the City can reduce VMT on a per-capita basis with land use policies that help City residents meet their daily needs within a short distance of home, thereby reducing trip lengths, and by encouraging development in areas with access to various modes of transportation other than automobile. As discussed in **Section 4.8, Transportation and Traffic**, the project's VMT per capita would be less than the existing VMT per capita. As such, the Project's contribution to vehicle-related GHG emissions would be less than significant.

**Threshold 4.3-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?**

### **Consistency with State Requirements**

As described previously, several initiatives, plans, policies, and regulations have been adopted at the State and local levels related to reducing GHG emissions. In general, California's goals and strategies for the systematic Statewide reduction of GHG emissions are embodied in the combination of EO S-3-05 and AB 32.

As shown in **Table 4.3-4**, GHG emissions that would occur from the proposed building construction and operation would be less than SCAQMD's proposed significance criteria for residential projects. The proposed development would not hinder progress toward achieving the goals of EO S-3-05. GHG emissions would not conflict with AB 32 or EO S-3-05.

### **Consistency with 2016 RTP/SCS Sustainable Communities Strategy**

The Project is consistent with regional strategies to reduce passenger VMT to achieve the per capita GHG emissions reduction targets of SB 32 for the SCAG region. The Project Site is within a high-quality transit area and is adequately served by existing public transit (i.e., Metro Gold Line and local bus lines). The Project is in the Central District Specific Plan area, which promotes pedestrian-oriented uses on Colorado Boulevard.

By providing housing within walking distance of jobs and within a transit-oriented district, the proposed Project is consistent with the goals and requirements of the 2016 RTP/SCS to reduce per capita passenger vehicle GHG emissions.

### **Consistency with Green City Action Plan**

The City adopted a Green Building Practices Ordinance<sup>21</sup> that promotes energy conservation by mandating certain building requirements currently voluntary under CALGreen requirements. Multifamily residential buildings of 4 stories in height or more would be subject to the mandatory Tier 1 CALGreen standards of Pasadena's Green Building Standards Code. Compliance with the code results in a 15 to 30 percent increase in building energy efficiency compared to the 2008 Building and Energy Efficiency Standards. The proposed Project would be constructed in compliance with the California Green Building Standards Code and would not impede the implementation of the Green City Action Plan.

## **E. CUMULATIVE IMPACTS**

Climate change is a cumulative impact from various global sources of activities that incrementally contribute to global GHG concentrations. Individual projects provide a small addition to total concentrations but contribute cumulatively to a global phenomenon. The goal of AB 32 is to require GHG emission reductions from existing conditions. As a result, cumulative GHG and climate change impacts must be analyzed from the perspective of whether they would impede the state's ability to meet its emission reduction goals.

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21 City of Pasadena Municipal Code, ch. 14.04, Green Building Standards Code, sec. 14.04.504.

To achieve Statewide goals, CARB is in the process of implementing regulations to reduce Statewide GHG emissions. However, currently, no applicable significance thresholds, specific reduction targets, and approved policies or guidance are in place to assist in determining significance at the project or cumulative level. Additionally, currently no generally accepted methodology exists to determine whether GHG emissions associated with a specific project represent new emissions or existing and/or displaced emissions.

In conformance with City of Pasadena recommendations for green buildings, GHG emissions reductions would be achieved through energy-efficient lighting and building design; installation of low-flow appliances; and water conservation. The methods used to establish this relative reduction are consistent with the approach used in the CARB's Scoping Plan for the implementation of AB 32 through 2020. The Project's features and GHG reduction measures make the Project consistent with the goals of AB 32.

The Project is consistent with the approach outlined in the CARB's Scoping Plan, particularly its emphasis on the identification of emissions reduction opportunities that promote economic growth while achieving greater energy efficiency and accelerating the transition to a low-carbon economy. The location and design of the Project reflect and support these core objectives. In addition, as recommended by CARB's Scoping Plan, the Project would use green building features as a framework for achieving crosscutting emissions reductions.

The Project would be consistent with the Green City Action Plan and measures under AB 32. Therefore, the Project will result in a less than significant contribution to cumulatively significant GHG emissions.

#### **F. MITIGATION MEASURES**

No mitigation measures are required.

#### **G. LEVEL OF SIGNIFICANCE AFTER MITIGATION**

GHG emission impacts would be less than significant.