IV. Environmental Impact Analysis

G. Greenhouse Gas Emissions

1. Introduction

This section provides a discussion of global climate change, existing regulations pertaining to global climate change, an inventory of the approximate greenhouse gas (GHG) emissions that would result from the Project, and an analysis of the significance of the impact of these GHGs. Calculation worksheets, assumptions, and model outputs used in the analysis are contained in Appendix E of this Draft EIR.

2. Environmental Setting

Global climate change refers to changes in average climatic conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation, and storms. Global warming, a related concept, is the observed increase in the average temperature of the Earth's surface and atmosphere. One identified cause of global warming is an increase of GHGs in the atmosphere. GHGs are those compounds in the Earth's atmosphere that play a critical role in determining the Earth's surface temperature.

The Earth's natural warming process is known as the "greenhouse effect." It is called the greenhouse effect because the Earth and the atmosphere surrounding it are similar to a greenhouse with glass panes in that the glass allows solar radiation (sunlight) into the Earth's atmosphere, but prevents radiative heat from escaping, thus warming the Earth's atmosphere. Some levels of GHGs keep the average surface temperature of the Earth close to a hospitable 60 degrees Fahrenheit. However, it is believed that excessive concentrations of anthropogenic GHGs in the atmosphere can result in increased global mean temperatures, with associated adverse climatic and ecological consequences.

Scientists studying the particularly rapid rise in global temperatures have determined that 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.1

Changes in atmospheric concentrations of GHGs and aerosols, land cover, and solar radiation alter the energy balance of the climate system. Global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70 percent between 1970 and 2004. The annual emissions of carbon dioxide (CO₂) grew by about 80 percent between 1970 and 2004. Atmospheric concentrations of CO₂ and methane (CH₄) in 2005 exceed by far the natural range over the last 650,000 years. Global increases in CO₂ concentrations are due primarily to fossil fuel use, with land-use change providing another substantial but smaller contribution. Studies have concluded that it is very likely that the observed increase in CH₄ concentration is predominantly due to agriculture and fossil fuel use.2

In August 2007, international climate talks held under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC) led to the official recognition by the participating nations that global emissions of GHG must be reduced. According to the "Ad Hoc Working Group on Further Commitments of Annex I Parties under the Kyoto Protocol," avoiding the most catastrophic events forecast by the United Nations Intergovernmental Panel on Climate Change (IPCC) would entail emissions reductions by industrialized countries in the range of 25 to 40 percent below 1990 levels. Because of the Kyoto Protocol's Clean Development Mechanism, which gives industrialized countries credit for financing emission-reducing projects in developing countries, such an emissions goal in industrialized countries could ultimately spur efforts to cut emissions in developing countries, as well.³

As reported by SCAG: "Global warming poses a serious threat to the economic well-being, public health and natural environment in southern California and beyond. The potential adverse impacts of global warming include, among others, a reduction in the quantity and quality of water supply, a rise in sea level, damage to marine and other ecosystems, and an increase in the incidences of infectious diseases. Over the past few decades, energy intensity of the national and State economy has been declining due to the shift to a more service-oriented economy. California ranked fifth lowest among the states

Climate Change 101: Understanding and Responding to Global Climate Change, published by the Pew Center on Global Climate Change and the Pew Center on the States.

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United Nations Framework Convention on Climate Change, Press Release-Vienna UN Conference Shows Consensus on Key Building Blocks for Effective International Response to Climate Change, August 31, 2007.

in CO₂ emissions from fossil fuel consumption per unit of Gross State Product. However, in terms of total CO₂ emissions, California is second only to Texas in the nation and is the 12th largest source of climate change emissions in the world, exceeding most nations. The SCAG region, with close to half of the State's population and economic activities, is also a major contributor to the global warming problem."⁴

a. GHG Background

By definition, GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).⁵ Carbon dioxide is the most abundant GHG. Other GHGs are less abundant, but have higher global warming potential than CO₂. Thus, emissions of other GHGs are frequently expressed in the equivalent mass of CO₂, denoted as CO₂e. Forest fires, decomposition, industrial processes, landfills, and consumption of fossil fuels for power generation, transportation, heating, and cooking are the primary sources of GHG emissions. A general description of the GHGs discussed is provided in Table IV.G-1 on page IV.G-4.

Global Warming Potentials (GWPs) are one type of simplified index based upon radiative properties that can be used to estimate the potential future impacts of emissions of different gases upon the climate system in a relative sense. GWP is based on a number of factors, including the radiative efficiency (heat-absorbing ability) of each gas relative to that of CO₂, as well as the decay rate of each gas (the amount removed from the atmosphere over a given number of years) relative to that of CO₂. A summary of the atmospheric lifetime and GWP of selected gases is presented in Table IV.G-2 on page IV.G-5. As indicated below, GWPs range from 1 to 22,800.

b. Projected Impacts of Global Warming in California

According to the 2006 California Climate Action Team (CAT) Report, temperature increases arising from increased GHG emissions potentially could result in a variety of impacts to the people, economy, and environment of California associated with a projected increase in extreme conditions, with the severity of the impacts depending upon actual future emissions of GHGs and associated warming. If emissions from GHGs are not

Southern California Association of Governments, The State of the Region—Measuring Regional Progress, December 2006, p. 121.

⁵ As defined by California AB32 and SB104.

Table IV.G-1 Description of Identified Greenhouse Gases

Greenhouse Gas	General Description
Carbon Dioxide (CO ₂)	An odorless, colorless GHG, which has both natural and anthropocentric sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused) sources of carbon dioxide are burning coal, oil, natural gas, and wood.
Methane (CH₄)	A flammable gas and is the main component of natural gas. When one molecule of methane is burned in the presence of oxygen, one molecule of carbon dioxide and two molecules of water are released. There are no ill health effects from methane. A natural source of methane is the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources are from landfills, fermentation of manure, and cattle.
Nitrous Oxide (N ₂ O)	A colorless GHG. High concentrations can cause dizziness, euphoria, and sometimes slight hallucinations. Nitrous oxide is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used in rocket engines, race cars, and as an aerosol spray propellant.
Hydrofluorocarbons (HFCs)	Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. Because they destroy stratospheric ozone, the production of CFCs was stopped as required by the Montreal Protocol in 1987. HFCs are synthetic man-made chemicals that are used as a substitute for CFCs as refrigerants. HFCs deplete stratospheric ozone, but to a much lesser extent than CFCs.
Perfluorocarbons (PFCs)	PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. High-energy ultraviolet rays about 60 kilometers above the earth's surface are able to destroy the compounds. PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane and hexafluoroethane. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.
Sulfur Hexafluoride (SF ₆)	An inorganic, odorless, colorless, non-toxic, and nonflammable gas. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Source: Association of Environmental Professionals, Alternative Approaches to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents, Final, June 29, 2007.

Table IV.G-2
Atmospheric Lifetimes and Global Warming Potentials

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)
Carbon Dioxide	50–200	1
Methane	12 (+/-3)	25
Nitrous Oxide	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC-14: Tetrafluoromethane (CF ₄)	50,000	7,390
PFC-116: Hexafluoroethane (C ₂ F ₆)	10,000	12,200
Sulfur Hexafluoride (SF ₆)	3,200	22,800

Source: IPCC, 2007, www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html, accessed February 12, 2013.

reduced substantially, the warming increase could have the following consequences in California:⁶

- The Sierra snowpack would decline between 70 and 90 percent, threatening California's water supply;
- Attainment of air quality standards would be impeded by increasing emissions, accelerating chemical processes, and raising inversion temperatures during stagnation episodes;
- Erosion of California's coastlines would increase, as well as sea water intrusion;
- Pest infestation and vulnerability to fires of the State's forests would increase;
- Rising temperatures would increase power demand, especially in the summer season.

With regard to public health, as reported by the Center for Health and the Global Environment at the Harvard Medical School, the following are examples of how climate

⁶ California Environmental Protection Agency, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006, p. 11.

change can affect cardio-respiratory disease: (1) pollen is increased by higher levels of atmospheric CO_2 ; (2) ground-level ozone or photochemical smog, which is the reaction of oxides of nitrogen (NO_X) and VOC and which are "tailpipe emissions," is temperature dependent (i.e., heat increases smog); ground-level ozone, which is also increased by higher levels of ultraviolet B radiation from stratospheric ozone depletion, has been shown to cause asthma in children and to trigger attacks and causes increased morbidity and mortality in those with chronic obstructive pulmonary disease; (3) heat waves can result in temperature inversions, leading to trapped masses or unhealthy air contaminants by smog, particulates, and other pollutants; and (4) the incidence of forest fires is increased by drought secondary to climate change and to the lack of spring runoff from reduced winter snows; these fires can create smoke and haze which can settle over urban populations causing acute and exacerbating chronic respiratory illness.⁷

c. Existing Conditions

(1) Existing Statewide Greenhouse Gas Emissions

GHGs are the result of both natural and human-influenced activities. Regarding human-influenced activities, motor vehicle travel, consumption of fossil fuels for power generation, industrial processes, heating and cooling, landfills, agriculture, and wildfires are the primary sources of GHG emissions. Without human intervention, the Earth maintains an approximate balance between the emission of GHGs into the atmosphere and the storage of GHGs in oceans and terrestrial ecosystems. Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have contributed to the rapid increase in atmospheric levels of GHGs over the last 150 years. As reported by the California Energy Commission (CEC), California contributes 1.4 percent of global and 6.2 percent of national GHG emissions.8 It should be noted that California represents approximately 12 percent of the national population. Approximately 80 percent of GHGs in California are carbon dioxide produced from fossil fuel combustion. The current California GHG inventory compiles statewide anthropogenic GHG emissions and sinks (carbon storage, such as from trees) from years 2004 to 2010. It includes estimates for CO₂, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. The GHG inventory for California is presented in Table IV.G-3 on page IV.G-7.

⁷ Epstein, Paul R. et al., Urban Indicators of Climate Change, Report from the Center for Health and the Global Environment, Harvard Medical School and the Boston Public Health Commission, August 2003, unpaginated.

⁸ California Energy Commission, Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004, CEC-600-2006-013, October 2006.

Table IV.G-3 California GHG Inventory (million metric tonnes CO₂e)

	2004	2005	2006	2007	2008	2009	2010
Transportation	183.46	186.34	186.95	187.38	178.18	173.34	173.18
On Road	169.85	171.35	171.63	172.66	164.39	160.25	159.70
Passenger Vehicles	134.66	134.83	134.71	134.93	129.37	127.69	126.99
Heavy Duty Trucks	35.19	36.52	36.93	37.74	35.02	32.56	32.70
Ships & Commercial Boats	3.42	3.69	3.74	3.71	3.62	3.42	3.39
Aviation (Intrastate)	4.37	4.84	5.04	5.26	5.22	5.33	4.76
Rail	2.91	3.34	3.53	3.17	2.58	1.95	2.35
Unspecified	2.91	3.12	3.01	2.57	2.36	2.38	2.99
Percent of Total Emissions	37%	38%	39%	38%	36%	38%	38%
Electric Power	116.25	108.89	105.55	114.97	121.16	103.58	93.30
In-State Generation	50.20	46.08	50.87	55.15	55.34	55.53	49.70
Natural Gas	42.40	38.11	43.07	47.12	48.02	48.90	43.10
Other Fuels	5.59	5.77	5.64	5.85	5.15	5.28	5.49
Fugitive and Process Emissions	2.21	2.19	2.16	2.19	2.16	1.36	1.11
Imported Electricity	66.05	53.81	54.69	59.81	65.83	48.05	43.59
Unspecified Imports	32.92	30.02	27.96	32.73	37.93	14.99	13.45
Specified Imports	33.13	32.80	26.73	27.08	27.90	33.05	30.14
Percent of Total Emissions	24%	22%	22%	23%	25%	23%	21%
Commercial and Residential	42.83	41.18	41.85	42.07	42.39	42.61	43.89
Residential Fuel Use	29.45	28.18	28.55	28.70	29.03	28.65	29.38
Natural Gas	27.37	25.97	26.59	26.72	26.66	26.30	27.03
Other Fuels	2.07	2.21	1.95	1.98	2.37	2.35	2.36
Commercial Fuel Use	12.76	12.60	12.88	12.87	12.99	13.04	13.47
Natural Gas	11.16	10.93	11.61	11.48	11.16	11.02	11.19
Other Fuels	1.60	1.67	1.27	1.39	1.83	2.02	2.29
Commercial Cogeneration Heat Output	0.62	0.40	0.42	0.49	0.37	0.92	1.03
Percent of Total Emissions	9%	8%	9%	9%	9%	9%	10%
Industrial	96.97	96.04	94.29	91.88	94.32	83.60	85.96
Refineries	32.71	33.95	35.04	34.74	34.08	28.13	30.80
General Fuel Use	19.05	18.15	18.05	17.01	18.15	17.60	20.26
Natural Gas	12.80	12.72	12.38	11.56	12.37	11.46	13.46
Other Fuels	6.25	5.43	5.67	5.45	5.77	6.14	6.80
Oil & Gas Extraction ^a	17.93	16.71	14.01	14.63	17.81	16.71	15.78
Fuel Use	17.56	16.37	13.24	13.83	17.02	15.92	15.00
Fugitive Emissions	0.37	0.35	0.77	0.80	0.79	0.79	0.78

City of Pasadena SCH No. 2013071018

Table IV.G-3 (Continued) California GHG Inventory (million metric tonnes CO₂e)

	2004	2005	2006	2007	2008	2009	2010
Cement Plants	9.80	9.90	9.73	9.13	8.62	5.72	5.55
Clinker Production	5.77	5.85	5.80	5.55	5.28	3.60	3.46
Fuel Use	4.03	4.05	3.93	3.58	3.33	2.12	2.09
Cogeneration Heat Output	12.91	12.40	12.15	11.14	10.39	10.26	7.72
Other Process Emissions	4.56	4.93	5.30	5.23	5.27	5.18	5.84
Percent of Total Emissions	20%	20%	19%	19%	19%	18%	19%
Recycling and Waste	6.34	6.65	6.75	6.71	6.90	6.94	6.98
Landfills ^b	6.17	6.47	6.54	6.49	6.66	6.70	6.72
Percent of Total Emissions	1%	1%	1%	1%	1%	2%	2%
High Global Warming Potential	13.32	13.90	14.26	14.27	14.44	14.76	15.66
Ozone Depleting Substance Substitutes	11.59	12.08	12.40	12.48	12.57	12.90	13.84
Electricity Grid SF6 Losses ^c	1.04	1.03	0.99	0.93	0.95	0.91	0.85
Semiconductor Manufacturing ^b	0.68	0.78	0.87	0.86	0.92	0.95	0.96
Percent of Total Emissions	3%	3%	3%	3%	3%	3%	3%
Agriculture ^d	33.24	33.48	34.59	33.44	34.34	32.81	32.45
Livestock	17.69	18.33	18.69	19.93	20.23	20.05	19.60
Enteric Fermentation (Digestive Process)	8.76	9.05	9.14	9.70	9.67	9.51	9.35
Manure Management	8.94	9.28	9.55	10.23	10.56	10.53	10.25
Crop Growing & Harvesting	11.02	10.52	10.57	9.70	10.19	10.11	10.04
Fertilizers	9.48	9.08	8.96	8.27	8.81	8.72	8.66
Soil Preparation and Disturbances	1.47	1.37	1.55	1.36	1.31	1.32	1.30
Crop Residue Burning	0.06	0.07	0.06	0.07	0.07	0.07	0.07
General Fuel Use	4.53	4.63	5.33	3.80	3.92	2.65	2.82
Diesel	3.17	3.41	3.87	2.68	3.00	1.78	1.99
Natural Gas	0.82	0.70	0.88	0.79	0.75	0.69	0.65
Gasoline	0.52	0.52	0.57	0.33	0.17	0.17	0.18
Other Fuels	0.00	0.00	0.01	0.00	0.01	0.00	0.00
Percent of Total Emissions	7%	7%	7%	7%	7%	7%	7%
Forestry	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Wildfire (methane & nitrous oxide)	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Percent of Total Emissions	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Total Gross Emissions	492.60	486.68	484.43	490.89	491.92	457.83	451.60
Forestry Net Emissions	-4.17	-4.03	-3.88	-3.95	-3.85	-3.81	e
Total Net Emissions	469.72	468.82	479.59	472.54	471.29	476.79	^e

City of Pasadena SCH No. 2013071018

Table IV.G-3 (Continued) California GHG Inventory (million metric tonnes CO₂e)

	2004	2005	2006	2007	2008	2009	2010
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- Reflects emissions from combustion of fuels plus fugitive emissions.
- These categories are listed in the Industrial sector of CARB's GHG Emission Inventory sectors.
- ^c This category is listed in the Electric Power sector of CARB's GHG Emission Inventory sectors.
- ^a Reflects use of updated USEPA models for determining emissions from livestock and fertilizers.
- ^e Revised methodology under development.

Source: California GHG Inventory for 2000–2010—by Category as Defined in the Climate Change Scoping Plan million tonnes of CO₂e—(based upon IPCC Second Assessment Report's Global Warming Potentials), www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-10_2013-02-19.pdf.

(2) Existing Project Site Emissions

The Project Site is currently developed with a total of 929,585 square feet of floor area surrounded by large areas of surface parking providing a total of 1,361 surface parking spaces. Under the proposed Project all existing buildings would remain and no Project development (i.e., no increase in square feet of development) is proposed south of Holly Street. The existing on-site buildings and the current main Parsons Corporation entrance off of Walnut Street would remain in place with the proposed Project. Project development would instead occur within the large areas of surface parking.

Existing surface parking lot operations generate greenhouse gas emissions from area and energy sources. Area source emissions are generated by landscape equipment associated with maintaining landscape within the surface parking lots. Energy source emissions are generated by use of energy for lighting of the surface parking lots. Mobile source emissions generated by motor vehicle trips to and from the Project Site are assumed to be associated with the buildings on the Project Site and not the surface parking lots (i.e., there would be no vehicle trips to the surface parking lots without the buildings on the Project Site). The combined emissions from the existing surface parking lot are minimal and, therefore, were conservatively assumed to be zero for comparison to the proposed Project. An estimate of existing GHG emissions is provided in Appendix E.

d. Regulatory Framework

In response to growing scientific and political concern with global climate change, Federal and State entities have adopted a series of laws to reduce emissions of GHGs to the atmosphere.

City of Pasadena SCH No. 2013071018

(1) Federal

(a) Federal Clean Air Act

The U.S. Supreme Court ruled in *Massachusetts v. Environmental Protection Agency*, 127 S.Ct. 1438 (2007), that CO₂ and other GHGs are pollutants under the federal Clean Air Act, which the USEPA must regulate if it determines they pose an endangerment to public health or welfare. The U.S. Supreme Court did not mandate that the USEPA enact regulations to reduce GHG emissions. Instead, the court found that the USEPA could avoid taking action if it found that GHGs do not contribute to climate change or if it offered a "reasonable explanation" for not determining that GHGs contribute to climate change.

On April 17, 2009, the USEPA issued a proposed finding that GHGs contribute to air pollution that may endanger public health or welfare. On April 24, 2009, the proposed rule was published in the Federal Register under Docket ID No. EPA-HQ-OAR-2009-0171. The USEPA stated that high atmospheric levels of GHGs "are the unambiguous result of human emissions, and are very likely the cause of the observed increase in average temperatures and other climatic changes." The USEPA further found that "atmospheric concentrations of greenhouse gases endanger public health and welfare within the meaning of Section 202 of the Clean Air Act." The findings were signed by the USEPA Administrator on December 7, 2009. The final findings were published in the Federal Register on December 15, 2009. The final rule was effective on January 14, 2010. While these findings alone do not impose any requirements on industry or other entities, this action is a prerequisite to regulatory actions by the USEPA, including but not limited to GHG emissions standards for light-duty vehicles.

On July 20, 2011, the USEPA published its final rule deferring GHG permitting requirements for carbon dioxide emission from biomass-fired and other biogenic sources until July 21, 2014. Environmental groups have challenged the deferral. In September 2011, EPA released an "Accounting Framework for Biogenic CO₂ Emissions from Stationary Sources," which analyzes accounting methodologies and suggests an implementation for biogenic carbon dioxide emitted from stationary sources.

On April 4, 2012, USEPA published a proposed rule to establish, for the first time, a new source performance standard for GHG emissions. Under the proposed rule, new fossil fuel–fired electric generating units larger than 25 MW are required to limit emissions to 1,000 pounds CO₂/MWh on an average annual basis, subject to certain exceptions. In

United States Environmental Protection Agency website, Climate Change (www.epa.gov/climate-change/endangerment.html).

addition, on April 17, 2012, USEPA issued emission rules for oil production and natural gas production and processing operations.

(b) Federal Corporate Average Fuel Economy (CAFÉ) Standards

In response to the *Massachusetts v. Environmental Protection Agency* ruling, President Bush issued an executive order on May 14, 2007, directing the USEPA, the United States Departments of Transportation (USDOT), and the USDOE to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. On December 19, 2007, the Energy Independence and Security Act of 2007 (H.R. 6; Pub. L. 110-140) was signed into law.

The Energy Independence and Security Act of 2007 created new federal requirements for increases in fleet-wide fuel economy for passenger vehicles and light trucks. The federal legislation requires a fleet-wide average of 35 miles per gallon to be achieved by 2020. The National Highway Traffic Safety Administration is directed to phase in requirements to achieve this goal. Analysis by CARB suggests that attainment of this goal will require an annual improvement of approximately 3.4 percent between 2007 and 2020. In addition to setting increased CAFE standards for motor vehicles, the Energy Independence and Security Act of 2007 included other provisions: (1) renewable fuel standard (Section 202); (2) appliance and lighting efficiency standards (Sections 301–325); and (3) building energy efficiency (Sections 411–441). Additional provisions addressed energy savings in government and public institutions, promoting research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

On July 1, 2009, the USEPA granted California a waiver which enables the state to enforce stricter tailpipe emissions on new motor vehicles. In addition, on May 19, 2009, President Obama announced a new National Fuel Efficiency Policy aimed at increasing fuel economy and reducing GHG pollution. On September 15, 2009, the USEPA and the Department of Transportation's National Highway Traffic Safety Administration issued a joint proposal to establish a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles that will reduce GHG emissions and improve fuel economy. The proposed standards would be phased in and would require passenger cars and light-duty trucks to comply with a declining emissions standard. In 2012, passenger

CARB comparison between Pavley Assembly Bill 1493 and the Federal 2007 CAFE standards (www.arb. ca.gov/cc/ccms/ab1493_v_cafe_study.pdf).

The White House, Office of the Press Secretary, May 19, 2009, (www.whitehouse.gov/the_press_office/ President-Obama-Announces-National-Fuel-Efficiency-Policy/).

cars and light-duty trucks would have to meet an average emissions standard of 295 grams of CO_2 per mile and 30.1 miles per gallon. By 2016, the vehicles would have to meet an average standard of 250 grams of CO_2 per mile and 35.5 miles per gallon.

(2) State

(a) California Assembly Bill 1493

Assembly Bill 1493, passed in 2002, requires the development and adoption of regulations to achieve "the maximum feasible reduction of greenhouse gases" emitted by noncommercial passenger vehicles, light-duty trucks, and other vehicles used primarily for personal transportation in the State. CARB originally approved regulations to reduce GHGs from passenger vehicles in September 2004, with the regulations to take effect in 2009. On September 24, 2009, CARB adopted amendments to these "Pavley" regulations that reduce GHG emissions in new passenger vehicles from 2009 through 2016.¹² Although setting emission standards on automobiles is solely the responsibility of the USEPA, the Federal Clean Air Act allows California to set state-specific emission standards on automobiles if the state first obtains a waiver from the USEPA. As stated above, the USEPA granted California that waiver on July 1, 2009. A comparison between the Assembly Bill 1493 standards and the Federal Corporate Average Fuel Economy was completed by CARB and is available at www.arb.ca.gov/cc/ccms/reports/ab1493 v cafe study.pdf. The emission standards become increasingly more stringent through the 2016 California is also committed to further strengthening these standards model year. beginning with 2020 model year vehicles to obtain a 45-percent GHG reduction in comparison to the 2009 model year.

(b) Executive Order S-1-07 (California Low Carbon Fuel Standard)

Executive Order S-1-07, the Low Carbon Fuel Standard (issued on January 18, 2007), requires a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. Regulatory proceedings and implementation of the Low Carbon Fuel Standard have been directed to CARB. The Low Carbon Fuel Standard has been identified by CARB as a discrete early action item in the adopted *Climate Change Scoping Plan* (discussed in Section IV.G.2.2.c(2)(e) below). CARB expects the Low Carbon Fuel Standard to achieve the minimum 10-percent reduction goal; however, many of the early action items outlined in the *Climate Change Scoping Plan* work in tandem with one another. To avoid the potential for double-counting emission reductions associated with AB 1493 (see previous discussion), the *Climate Change Scoping Plan* has modified the aggregate reduction expected from the Low Carbon Fuel Standard to 9.1 percent. In

¹² Clean Car Standards—Pavley, Assembly Bill 1493, available at www.arb.ca.gov/cc/ccms/ccms.htm.

accordance with the *Climate Change Scoping Plan*, this analysis incorporates the modified reduction potential for the Low Carbon Fuel Standard. CARB released a draft version of the Low Carbon Fuel Standard in October 2008. The final regulation was approved by the Office of Administrative Law and filed with the Secretary of State on January 12, 2010; the Low Carbon Fuel Standard became effective on the same day.

(c) Executive Order S-3-05

Executive Order S-3-05, issued in June 2005, established GHG emissions targets for the State, as well as a process to ensure the targets are met. The order directed the Secretary for California EPA to report every two years on the State's progress toward meeting the Governor's GHG emission reduction targets. As a result of this executive order, the California Climate Action Team (CAT), led by the Secretary of the California EPA, was formed. The CAT is made up of representatives from a number of State agencies and was formed to implement global warming emission reduction programs and reporting on the progress made toward meeting statewide targets established under the Executive Order. The CAT reported several recommendations and strategies for reducing GHG emissions and reaching the targets established in the Executive Order. The statewide GHG targets are as follows:

- By 2010, reduce to 2000 emission levels;
- By 2020, reduce to 1990 emission levels; and
- By 2050, reduce to 80 percent below 1990 levels.

The CAT stated that smart land use is an umbrella term for strategies that integrate transportation and land-use decisions. Such strategies generally encourage jobs/housing proximity, promote transit-oriented development (TOD), and encourage high-density residential/commercial development along transit corridors. These strategies develop more efficient land-use patterns within each jurisdiction or region to match population increases, workforce, and socioeconomic needs for the full spectrum of the population. "Intelligent transportation systems" is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and the movement of people, goods, and service.¹⁴

California Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006.

¹⁴ California Environmental Protection Agency, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006, p. 58.

(d) California Global Warming Solutions Act of 2006 (AB 32)

The California Global Warming Solutions Act of 2006 (also known as AB 32) commits the State to achieving the following:

- By 2010, reduce to 2000 GHG emission levels; and
- By 2020, reduce to 1990 levels.

To achieve these goals which are consistent with the CAT GHG targets for 2010 and 2020, AB 32 mandates that CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce statewide GHG emissions from stationary sources consistent with the CAT strategies, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. Many of the regulations required to meet the goals under AB 32 have been adopted and were to be implemented no later than January 1, 2012.¹⁵

(e) Climate Change Scoping Plan

In 2008, CARB approved a *Climate Change Scoping Plan* as required by AB 32.¹⁶ The *Climate Change Scoping Plan* proposes a "comprehensive set of actions designed to reduce overall carbon 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."¹⁷ The *Climate Change Scoping Plan* has a range of GHG reduction actions which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 implementation fee to fund the program.

The Climate Change Scoping Plan calls for a "coordinated set of solutions" to address all major categories of GHG emissions. Transportation emissions will be addressed through a combination of higher standards for vehicle fuel economy, implementation of the Low Carbon Fuel Standard, and greater consideration to reducing trip length and generation through land use planning and transit-oriented development.

¹⁵ CARB's list of discrete early action measures that could be adopted and implemented before January 1, 2010, was approved on June 21, 2007. The three adopted discrete early action measures are: (1) a low-carbon fuel standard, which reduces carbon intensity in fuels state-wide; (2) reduction of refrigerant losses from motor vehicle air conditioning system maintenance; and (3) increased methane capture from landfills, which includes requiring the use of state-of-the-art capture technologies.

Climate Change Proposed Scoping Plan was approved by CARB on December 11, 2008.

Climate Change Scoping Plan, CARB, December 2008, www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm.

Buildings, land use, and industrial operations will be encouraged and, sometimes, required to use energy more efficiently. Utility energy supplies will change to include more renewable energy sources through implementation of the Renewables Portfolio Standard.¹⁸ Additionally, the *Climate Change Scoping Plan* emphasizes opportunities for households and businesses to save energy and money through increasing energy efficiency. It indicates that substantial savings of electricity and natural gas will be accomplished through "improving energy efficiency by 25 percent."

The *Climate Change Scoping Plan* identifies a number of specific issues relevant to the Project including:

 The potential of using the green building framework as a mechanism which could enable GHG emissions reductions in other sectors (i.e., electricity, natural gas), noting that:

"A Green Building strategy will produce greenhouse gas saving through buildings that exceed minimum energy efficiency standards, decrease consumption of potable water, reduce solid waste during construction and operation, and incorporate sustainable materials. Combined these measures can also contribute to healthy indoor air quality, protect human health and minimize impacts to the environment."

- The importance of supporting the Department of Water Resources' work to implement the Governor's objective to reduce per capita water use by 20 percent by 2020. Specific measures to achieve this goal include water use efficiency, water recycling, and reuse of urban runoff. The Climate Change Scoping Plan notes that water use requires substantial amounts of energy, including approximately one-fifth of state-wide electricity.
- Encouraging local governments to set quantifiable emission reduction targets for their jurisdictions and use their influence and authority to encourage reductions in emissions caused by energy use, waste and recycling, water and wastewater systems, transportation, and community design.

Subsequent to adoption of the *Climate Change Scoping Plan*, a lawsuit was filed challenging CARB's approval of the *Climate Change Scoping Plan Functional Equivalent Document (FED to the Climate Change Scoping Plan)*. On May 20, 2011 (Case No. CPF-09-509562), the court found that the environmental analysis of the alternatives in

For a discussion of Renewables Portfolio Standard, refer to subsection 2(d), California Renewables Portfolio Standard.

the *FED to the Climate Change Scoping Plan* was not sufficient under CEQA. CARB staff prepared a revised and expanded environmental analysis of the alternatives and the *Supplemental FED to the Climate Change Scoping Plan* was approved on August 24, 2011 (*Supplemental FED*). The *Supplemental FED* indicated that there is the potential for adverse environmental impacts associated with implementation of the various GHG emission reduction measures recommended in the *Climate Change Scoping Plan*.

Forecasting the amount of emissions that would occur in 2020 if no actions are taken was necessary to assess the scope of the reductions California has to make to return to the 1990 emissions level by 2020 as required by AB 32. The no-action scenario is known as "business-as-usual" or BAU. The California Air Resources Board originally defined the BAU scenario as emissions in the absence of any GHG emission reduction measures discussed in the Climate Change Scoping Plan.

As part of the *Supplemental FED*, CARB updated the projected 2020 BAU emissions inventory based on current economic forecasts (i.e., as influenced by the economic downturn) and emission reduction measures already in place, replacing its prior 2020 BAU emissions inventory. CARB staff derived the updated emissions estimates by projecting emissions growth, by sector, from the state's average emissions from 2006–2008. Specific emission reduction measures included are the million-solar-roofs program, the AB 1493 (Pavley I) motor vehicle GHG emission standards, and the Low Carbon Fuels Standard. In addition, CARB has factored into the 2020 BAU inventory emissions reductions associated with 33-percent Renewable Energy Portfolio Standard (RPS) for electricity generation. The updated BAU estimate of 507 million metric tonnes CO₂e by 2020 requires a reduction of 80 million metric tonnes CO₂e, or a 16-percent reduction below the estimated BAU levels to return to 1990 levels (i.e., 427 million metric tonnes CO₂e) by 2020.^{20,21}

The CARB 2020 BAU projection for GHG emissions in California was originally estimated to be 596 million metric tonne carbon dioxide equivalent (MMTCO₂e). The

Pavley I are the first GHG standards in the nation for passenger vehicles and took effect for model years starting in 2009 to 2016. Pavley I could potentially result in 27.7 million metric tonnes CO₂e reduction in 2020. Pavley II will cover model years 2017 to 2025 and potentially result in an additional reduction of 4.1 million metric tonnes CO₂e.

²⁰ CARB, Supplement to the AB 32 Scoping Plan FED, Table 1.2-2, Updated 2020 Business-as-Usual Emissions Forecast, www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf.

The emissions and reductions estimates found in the Supplemental FED to the Climate Change Scoping Plan fully replace the estimates published in the 2008 Climate Change Scoping Plan. See CARB, Resolution 11-27 (Aug. 24, 2011) (setting aside approval of 2008 Climate Change Scoping Plan and associated emissions forecasts, and approving the Supplemental FED).

updated CARB 2020 BAU projection in the Supplemental FED is approximately 545 MMTCO₂e.^{22, 23} Considering the updated BAU estimate of 545 MMTCO₂e by 2020, CARB estimates a 21.7-percent reduction below the estimated statewide BAU levels is necessary to return to 1990 emission levels (i.e., 427 MMTCO₂e) by 2020, instead of the approximate 28.4-percent BAU reduction previously reported under the original Climate Change Scoping Plan (2008). CARB also provided a lower 2020 BAU inventory forecast of approximately 507 MMTCO₂e, which took credit for certain GHG emission reduction measures already in place. When this lower forecast is used, the necessary reduction from BAU is approximately 16 percent. Section IV.G.3.b.3 herein contains additional discussion of the Supplemental FED, the updated BAU estimate, and the required reduction from BAU to meet AB 32's mandate. CARB is required to update the AB 32 Scoping Plan every five years. On February 10, 2014, CARB released a Draft Update to the AB 32 Scoping Plan that highlights California's progress toward meeting the 2020 GHG emission reduction mandate and builds upon the original Climate Change Scoping Plan (2008) with new strategies and recommendations. The Draft Update also defines CARB's climate change priorities for the next five years and sets the groundwork to reach California's long-term climate goals.²⁴

(f) California Renewables Portfolio Standard

The California Renewables Portfolio Standard (RPS) program (2002, Senate Bill [SB] 1078) requires that 20 percent of the available energy supplies are from renewable energy sources by 2017. In 2006, SB 107 accelerated the 20 percent mandate to 2010. These mandates apply directly to investor-owned utilities. On April 12, 2011, California Governor Jerry Brown signed into law Senate Bill 2X, which modified California's RPS program to require that both public and investor-owned utilities in California receive at least 33 percent of their electricity from renewable sources by the year 2020. California Senate Bill 2X also requires regulated sellers of electricity to meet an interim milestone of procuring 25 percent of their energy supply from certified renewable resources by 2016. These levels of reduction are consistent with the Pasadena Water and Power (PWP) commitment to achieve 35 percent renewables by 2020.

CARB, Attachment D, Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document (Aug. 19, 2011), www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf.

²³ CARB, Status of Scoping Plan Measures (2011), www.arb.ca.gov/cc/scopingplan/sp_measures_implementation_timeline.pdf.

²⁴ CARB, Draft Proposed First update to the Climate Change Scoping Plan (February 10, 2014), www.arb. ca.gov/cc/scopingplan/2013_update/draft_proposed_first_update.pdf.

PWP indicated that 24 percent of its electricity came from renewable resources in Year 2012. Therefore, under Senate Bill 2X, PWP must increase its electricity from renewable resources by an additional 9 percent to comply with the RPS of 33 percent.²⁵

(g) California Senate Bill 1368

California SB 1368, a companion bill to AB 32, requires the California Public Utilities Commission (CPUC) and the CEC to establish GHG emission performance standards for the generation of electricity. These standards will also generally apply to power that is generated outside of California and imported into the State. SB 1368 provides a mechanism for reducing the emissions of electricity providers, thereby assisting CARB to meet its mandate under AB 32. On January 25, 2007, the CPUC adopted an interim GHG Emissions Performance Standard, which is a facility-based emissions standard requiring that all new long-term commitments for baseload generation to serve California consumers be with power plants that have GHG emissions no greater than a combined cycle gas turbine plant. That level is established at 1,100 pounds of CO₂ per megawatt-hour. Further, on May 23, 2007, the CEC adopted regulations that establish and implement an identical Emissions Performance Standard of 1,100 pounds of CO₂ per megawatt-hour (see CEC Order No. 07-523-7).

(h) California Senate Bill 97

On June 19, 2008, the California Office of Planning and Research (OPR) released a technical advisory on addressing climate change. This guidance document outlines suggested components to CEQA disclosure: quantification of GHG emissions from a project's construction and operation; determination of significance of the project's impact to climate change; and if the project is found to be significant, the identification of suitable alternatives and mitigation measures.

California Senate Bill 97, passed in August 2007, is designed to work in conjunction with the California Environmental Quality Act (CEQA) and AB 32. Senate Bill 97 requires the OPR to prepare and develop guidelines for the mitigation of GHG emissions or the effects thereof, including but not limited to effects associated with transportation and energy consumption. These guidelines were required to be transmitted to the Resources Agency by July 1, 2009, to be certified and adopted by January 1, 2010. The OPR submitted the Proposed Draft Guideline Amendments for Greenhouse Gas Emissions to the Secretary for Natural Resources on April 13, 2009. The California Natural Resources Agency conducted formal rulemaking in 2009 and adopted the Guideline Amendments on December 30, 2009, which address the specific obligations of public agencies when

²⁵ Website http://cityofpasadena.net/waterandpower/PCL/.

analyzing GHG emissions under CEQA to determine a project's effects on the environment.

However, neither a threshold of significance nor any specific mitigation measures are included or provided in these CEQA Guideline Amendments.²⁶ The Guideline Amendments require a lead agency to make a good-faith effort, based on the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. The Guideline Amendments give discretion to the lead agency whether to: (1) use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use; and/or (2) rely on a qualitative analysis or performance-based standards. Further, the Guideline Amendments identify three factors that should be considered in the evaluation of the significance of GHG emissions:

- 1. The extent to which a project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
- 2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and
- 3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.²⁷

The administrative record of the promulgation of the Guidelines Amendments also clarify "that the effects of greenhouse gas emissions are cumulative, and should be analyzed in the context of California Environmental Quality Act's requirements for cumulative impact analysis."²⁸

The California Natural Resources Agency is required to periodically update the guidelines to incorporate new information or criteria established by CARB pursuant to AB 32. Senate Bill 97 applies retroactively to any environmental impact report, negative declaration, mitigated negative declaration, or other document required by CEQA, which has not been finalized.

See 14 Cal. Code Regs. §§ 15064.7 (generally giving discretion to lead agencies to develop and publish thresholds of significance for use in the determination of the significance of environmental effects), 15064.4 (giving discretion to lead agencies to determine the significance of impacts from GHGs).

²⁷ 14 Cal. Code Regs. § 15064.4(b).

²⁸ Letter from Cynthia Bryant, Director of the Office of Planning and Research to Mike Chrisman, Secretary for Natural Resources (April 13, 2009).

(i) California Senate Bill 375

Acknowledging the relationship between land use planning and transportation sector GHG emissions, California SB 375 was passed by the State Assembly on August 25, 2008, and signed by the Governor on September 30, 2008. This legislation links regional planning for housing and transportation with the GHG reduction goals outlined in AB 32. Reductions in GHG emissions would be achieved by, for example, locating employment opportunities close to transit. Under the bill, each Metropolitan Planning Organization would be required to adopt a Sustainable Community Strategy to encourage compact development so that the region will meet a target, created by CARB, for reducing GHG emissions.

Metropolitan Planning Organizations are required to identify strategies to reduce passenger vehicle miles traveled and trips that achieve these targets in a Sustainable Community Strategy. If the Sustainable Community Strategy is unable to achieve the regional GHG emissions reduction targets, than the Metropolitan Planning Organization is required to prepare an alternative planning strategy that shows how the GHG emissions reduction target could be achieved through alternative development patterns, infrastructure, and/or transportation measures. Metropolitan Planning Organizations have no land use authority at the local level as the majority of land use decisions are vested with local governments. Therefore, local-level participation in regional efforts will be critical to the success of any Sustainable Community Strategy or alternative planning strategy.

(j) Title 24 Energy Efficiency Standards

California's Energy Efficiency Standards for Residential and Nonresidential Buildings, located at Title 24, Part 6 of the California Code of Regulations and commonly referred to as "Title 24," were established in 1978 in response to a legislative mandate to reduce California's energy consumption. Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.²⁹

The most recent amendments to Title 24 became effective January 1, 2014; however, effective date for the energy provisions was revised to July 1, 2014. As such, the 2010 California Energy Code will remain in effect until July 1, 2014. The most recent

See www.energy.ca.gov/title24/ for additional information.

³⁰ California Energy Commission, Revised Effective Date for the 2013 California Building Energy Efficiency Standards, www.energy.ca.gov/title24/2013standards/2013_standards_revised_effective_date.html, accessed March 7, 2014.

amendments to Title 24 continue to improve upon the current standards for new construction of, and additions and alternations to, residential and nonresidential buildings to meet the mandates of AB 32 and to pursue California's energy policy that energy efficiency is the resource of first choice for meeting California's energy needs.³¹

(k) California Green Building Standards

The California Green Building Standards Code, which is Part 11 of the California Code of Regulations, is commonly referred to as the CALGreen Code. The 2008 edition, the first edition of the CALGreen Code, contained only voluntary standards. The 2010 CALGreen Code is a code with mandatory requirements for State-regulated buildings, and structures throughout California beginning on January 1, 2011. The 2010 CALGreen Code contains requirements for construction site selection, storm water control during construction, construction waste reduction, indoor water use reduction, material selection, natural resource conservation, site irrigation conservation and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning which is a process for the verification that all building systems, like heating and cooling equipment and lighting systems are functioning at their maximum efficiency.

The 2013 CALGreen Code will go into effect on July 1, 2014. There are a number of important updates in the 2013 code, such as: (1) an extensive update of California's Energy Code; (2) updated CALGreen-requirements for nonresidential building alterations and additions; and (3) new plumbing code provisions pertaining to greywater and rainwater catchments.

(3) Regional

(a) South Coast Air Quality Management District

The Southern California Air Quality Management District (SCAQMD) adopted a "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:

³¹ See www.energy.ca.gov/title24/2013standards/index.html.

- 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 2008, SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds.³² Within its October 2008 document, the SCAQMD proposed the use of a percent emission reduction target to determine significance for commercial/residential projects that emit greater than 3,000 metric tonnes per year. On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for stationary source/industrial projects where the SCAQMD is lead agency. However, the SCAQMD has yet to 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.³³ The aforementioned Working Group has been inactive since 2011.

(b) Southern California Association of Governments

On April 4, 2012, the Regional Council of the Southern California Association of Governments (SCAG) adopted the 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy: Towards a Sustainable Future (2012–2035 RTP/SCS). Within the RTP, the SCS demonstrates the region's ability to attain and exceed the GHG emission-reduction targets set forth by CARB. The SCS outlines the region's plan for integrating the transportation network and related strategies with an overall land use pattern that responds to projected growth, housing needs, changing demographics, and transportation demands. The regional vision of the SCS maximizes current voluntary local efforts that support the goals of SB 375, as evidenced by several Compass Blueprint Demonstration Projects and various county transportation improvements. The SCS focuses the majority of new housing and job growth in high-quality transit areas and other opportunity areas in existing main streets, downtowns, and commercial corridors, resulting in an improved jobs-housing

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Website www.agmd.gov/hb/2008/December/081231a.htm (Attachment E).

Website www.aqmd.gov/ceqa/handbook/GHG/GHG.html.

balance and more opportunity for transit-oriented development. This overall land use development pattern supports and complements the proposed transportation network that emphasizes system preservation, active transportation, and transportation demand management measures. Finally, the 2012–2035 RTP/SCS fully integrates the two subregional SCSs prepared by the Gateway Cities and Orange County Council of Governments. On June 4, 2012, CARB accepted SCAG's quantification of GHG emission reductions from the 2012–2035 RTP/SCS and the determination that the 2012–2035 RTP/SCS would, if implemented, achieve the 2020 and 2035 GHG emission reduction targets established by CARB.³⁴

(4) Local

The City has taken proactive steps over the past several years to operate as a green and sustainable city. Several of the actions taken by the city include the following:³⁵

- · Adoption of an Environmental Charter;
- Endorsement of the United Nations Green Cities Declaration and UEA;
- Endorsement of the U.S. Conference of Mayors Climate Protection Agreement;
- Adoption of a Green City Action Plan;
- Adoption of an ordinance creating an Environmental Advisory Commission;
- Adoption of a Green Building Program; and
- Adoption of a resolution in support of Green Cities California.

(a) City of Pasadena Green Action Plan

As part of its Green City Action Plan (2006), the City identified several policies that would enable it to increase its sustainability while still meeting growing demands and reducing impacts to natural resources. Specific policies that would reduce GHG emissions, either directly or indirectly, include the following:

 Action 1—Increase the use of renewable energy to meet 10 percent of the city's peak electric load within seven years.

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CARB Executive Order G-12-039 (www.arb.ca.gov/cc/sb375/exec_order_scag_scs.pdf).

³⁵ Website www.cityofpasadena.net/greencity/.

- Action 2—Reduce the city's peak electric load by 10 percent within seven years through energy efficiency, shifting the timing of energy demands, and conservation methods. Future cost-effective energy efficiency programs include:
 - Conducting a feasibility study for installing devices on municipal and private buildings that reduce the power required to operate equipment and for shifting the equipment usage to off-peak.
 - Creating a "time of use" billing rate that offers lower rates for electric usage during off-peak hours than during peak hours. Other possible rates to consider include tiered energy rates.
- Action 3—Reduce GHG emission by 25 percent by 2030, and include a system for accounting and auditing these emissions.
- Action 4—Achieve zero waste to landfills and incinerators by 2040.
- Action 5—Reduce the use of disposable, toxic, or non-renewable product category by at least 50 percent in seven years.
- Action 8—Advance higher density, mixed use, walkable, bikeable and disabled accessible neighborhoods which coordinate land use and transportation with open space systems for recreation and ecological restoration.
- Action 21—Adopt municipal wastewater management guidelines and reduce the volume of untreated wastewater discharges by 10 percent in seven years through the expanded use of recycled water and the implementation of a sustainable urban watershed planning process that includes participants of all affected communities and is based on sound economic, social, and environmental principles.

(b) City of Pasadena Municipal Code

On December 9, 2013, the City Council approved Ordinance No. 7234, which amended Chapter 14 of the City of Pasadena Municipal Code by amending certain provisions to reflect local administrative changes and incorporating by reference portions of the 2013 CALGreen Code. Projects filed on or after January 1, 2014 must comply with various provisions of the 2013 CALGreen Code. Specific mandatory requirements and elective measures are provided for three categories: (1) low-rise residential buildings; (2) nonresidential and high-rise residential buildings, and (3) additions and alterations to nonresidential and high-rise residential buildings. The City's checklists for each of the categories are provided in Appendix E of this Draft EIR.

(c) City of Pasadena General Plan

The City of Pasadena does not have a General Plan Element specific to Global Warming and GHG emissions. However, the following policies from the 2004 Mobility Element of the City of Pasadena General Plan would also serve to reduce GHG emissions:

- Policy 1.1—Provide for new multifamily residential development in key transit corridors and provide for new employment in these corridors.
- Policy 1.2—Allow mixed-use zoning that includes housing and commercial uses to encourage living and working in the same area and to achieve a reduction of trips.
- Policy 1.7—Focus development densities for residential and non residential land uses around the six Gold Line Light Rail stations within City boundaries.
- Policy 1.8—Continue programs to implement both transportation improvements and automobile demand reduction programs that mitigate the impacts of new developments.
- Policy 1.12—Promote environmentally friendly and convenient transportation services.
- Policy 2.2—Develop local feeder-circulator transit services connecting residential neighborhoods and places of activity with Gold Line Light Rail stations.
- Policy 2.5—Encourage all transit operators to coordinate services, fare policies, and programs at major transit stations in order to enhance reliability of service, enable convenient transfers, promote pedestrian safety, and better inform the public about travel options.
- Policy 2.7—Promote improvements for pedestrians to support vibrant and active streets and major places of activity.
- Policy 2.8—Develop and maintain a comprehensive and integrated system of bikeways and increase bicycle racks at major destinations to promote bicycle riding for commuting and recreation.
- Policy 2.9—Foster programs and initiatives that promote non-auto travel, such as vanpools, ride-sharing and car-sharing membership services.
- Policy 2.10—Develop zoning guidelines to promote and foster establishment of transit Oriented Districts adjacent to light-rail stations to encourage living and working within the same community area.

City of Pasadena SCH No. 2013071018 • Policy 4.10—Assist employers in developing transportation benefit programs for transit users to provide options that are competitive with automobiles.

In addition to the Mobility Element, the 2004 Land Use Element of the City of Pasadena Comprehensive General Plan includes a variety of Policies that relate, either directly or indirectly, to greenhouse gas emissions. As with the Mobility Element, many of the Land Use Element Policies focus on reducing dependency on the automobile. A selection of relevant Policies from the 2004 Land Use Element include:

- Policy 1.3—Transit-Oriented and Pedestrian-Oriented Development:—Within targeted development areas, cluster development near light rail stations and along major transportation corridors thereby creating transit development "nodes" and encouraging pedestrian access.
- Policy 1.4—Mixed Use: Authorize and encourage Mixed Use development in targeted areas, including in-town housing, live-work spaces, and in-town commercial uses.
- Policy 1.5—Urban Villages: Authorize and encourage Urban Villages where appropriate and feasible in the urban core.
- Policy 1.6—Neighborhood Commercial: Encourage the provision of businesses that serve residents within walking distance of homes.
- Policy 18.1—Air Quality: Improve the air quality in Pasadena and in the region.
- Policy 20.1—Transit Accessibility: Increase accessibility of all public transportation services.
- Policy 20.2—Traffic Congestion: Reduce traffic congestion and protect residential neighborhoods from traffic impacts.
- Policy 20.3—Bicycles/Pedestrians: Promote the use of non-motorized modes of transportation, such as bicycles and walking within the City.
- Policy 20.5—Transportation/Human Services Linkage: Provide convenient, economical and accessible transportation services between residents and agencies delivering human services.
- Policy 21.3—Main Corridors/Downtown Circulator: Re-establish Lake Avenue and Colorado Boulevard as the main corridors of development and transportation in the City, including promoting the development and operation of a circulator system to serve downtown commercial areas and linked to light rail stations.

- Policy 21.9—Regional Approach: Promote a regional approach to transportation services in cooperation with other cities.
- Policy 22.1—Urban Design: Urban design programs shall encourage pedestrianoriented development, including encouragement of pedestrian circulation among
 parcels, uses, transit stops, and public or publicly accessed spaces; requiring
 human scale; encouraging varied and articulated facades; requiring regular
 visual (as in the use of first floor windows with clear glass) and physical access
 for pedestrians; requiring that ground floor residential and commercial entries
 face and engage the street; and encouraging pedestrian-oriented streetscapes
 amenities.
- Policy 22.3—Pedestrian Access: Encourage clear, direct and comfortable pedestrian access to the city's urban core and transit stops.
- Policy 22.4—Open Space: Where a park, natural open space or urban open space exists adjacent to or near transit-oriented development, these features should be incorporated into the development as open amenities.
- Policy 22.5—Pedestrian/Bicycle Shelters: Transit stops in a transit oriented development shall provide shelter for pedestrians, and secure bicycle storage.
- Policy 23.1—Pedestrian Movement: Intersections and streets within transitoriented developments shall be designed to facilitate pedestrian movement.
- Policy 23.2—Bicycle Connections: The street network system must provide bicycle connections to transit-oriented development commercial areas and transit stops.
- Policy 23.3—Bicycle Parking: Provide bicycle-parking facilities throughout commercial areas, at transit stops and in developments which include offices.
- The City has also prepared the Land Use and Mobility Element Update which addresses issues such as growth, transportation, design, and environmental sustainability which directly and indirectly address issues pertaining to GHG emissions. As this document has not been adopted, further analysis of this document has not been completed.

3. Environmental Impacts

a. Significance Thresholds

The Project may have a significant impact related to GHG emissions if:

- The Project's GHG emissions are less than 16 percent below "business-as-usual" conditions; or
- The Project conflicts with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

b. Methodology

The California Climate Action Registry (Climate Registry) General Reporting Protocol provides basic procedures and guidelines for calculating and reporting GHG emissions from a number of general and industry-specific activities.³⁶ The General Reporting Protocol is based on the "Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard" developed by the World Business Council for Sustainable Development and the World Resources Institute through "a multi-stakeholder effort to develop a standardized approach to the voluntary reporting of GHG emissions."³⁷ Although no numerical thresholds of significance have been developed, and no specific protocols are available for land use projects, the General Reporting Protocol provides a basic framework for calculating and reporting GHG emissions from the project. The information provided in this section is consistent with the General Reporting Protocol's reporting requirements.

The General Reporting Protocol recommends the separation of GHG emissions into three categories that reflect different aspects of ownership or control over emissions. They include the following:

- Scope 1: Direct, on-site combustion of fossil fuels (e.g., natural gas, propane, gasoline, and diesel).
- Scope 2: Indirect, off-site emissions associated with purchased electricity or purchased steam.
- Scope 3: Indirect emissions associated with other emissions sources, such as third-party vehicles and embodied energy.³⁸

³⁶ California Climate Action Registry, General Reporting Protocol Version 3.1, January 2009, www. climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009_FINAL.pdf.

³⁷ California Climate Action Registry General Reporting Protocol, Version 3.1, January 2009, www. climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf.

Embodied energy is a scientific term that refers to the quantity of energy required to manufacture and supply to the point of use a product, material, or service.

The General Reporting Protocol provides a range of basic calculation methods. However, the General Reporting Protocol calculations are typically designed for existing buildings or facilities. These retrospective calculation methods are not directly applicable to planning and development situations where buildings do not yet exist.

CARB recommends consideration of indirect emissions to provide a more complete picture of the GHG footprint of a facility. Annually reported indirect energy usage aids the conservation awareness of a facility and provides information to CARB to be considered for future strategies. For example, CARB has proposed requiring the calculation of direct and indirect GHG emissions as part of the AB 32 reporting requirements. Additionally, the Office of Planning and Research has noted that lead agencies "should make a good-faith effort, based on available information, to calculate, model, or estimate... GHG emissions from a project, including the emissions associated with vehicular traffic, energy consumption, water usage and construction activities." Therefore, direct and indirect emissions have been calculated for the Project.

A fundamental difficulty in the analysis of GHG emissions is the global nature of the existing and cumulative future conditions. Changes in GHG emissions can be difficult to attribute to a particular planning program or project because the planning effort or project may cause a shift in the locale for some type of GHG emissions, rather than causing "new" GHG emissions. As a result there is a lack of clarity as to whether a project's GHG emissions represent a net global increase, reduction, or no change in GHGs that would exist if the project were not implemented. The analysis of the Project's GHG emissions is particularly conservative in that it assumes all of the GHG emissions are new additions to the atmosphere.

The California Emissions Estimator Model (CalEEMod) is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from a variety of land use projects. CalEEMod was developed in collaboration with the air districts of California. Default data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is considered by the SCAQMD to be an accurate

³⁹ CARB, Initial Statement of Reasons for Rulemaking, Proposed Regulation for Mandatory Reporting of Greenhouse Gas Emissions Pursuant to the California Global Warming Solutions Act of 2006 (AB 32), Planning and Technical Support Division Emission Inventory Branch, October 19, 2007.

⁴⁰ OPR Technical Advisory, p. 5.

and comprehensive tool for quantifying air quality and GHG impacts from land use projects throughout California.⁴¹

(1) Construction

The Project's construction emissions were calculated using CalEEMod Version 2013.2.2. Details of the modeling assumptions and emission factors are provided in Appendix E of this Draft EIR. The calculations of the emissions generated during Project construction activities reflect the types and quantities of construction equipment that would be used to complete the proposed construction activities.

In accordance with the SCAQMD's guidance, GHG emissions from construction were amortized over the lifetime of the Project. The SCAQMD defines the lifetime of a project as 30 years. Therefore, total construction GHG emissions were divided by 30 to determine an annual construction emissions estimate comparable to operational emissions.

(2) Operation

Similar to construction, the SCAQMD recommended CalEEMod is used to calculate potential GHG emissions generated by the new land uses on the Project Site including mobile sources, electricity, natural gas, water usage/wastewater generation, and solid waste generation and disposal.

Mobile source emission calculations associated with operation of the new land uses use a projection of annual vehicle miles traveled, which is derived from the Transportation Study prepared for the Project.⁴² These values account for the daily and seasonal variations in trip frequency and length associated with new residential, employee, and visitor trips to and from the Project Site and other activities that require a vehicle trip. CalEEMod calculates GHG emissions from all other sources based on the increase in the specific number of dwelling units or square footages of the Project.

(3) Consistency with Assembly Bill 32

A particularly illustrative method to determine consistency with AB 32, and one that has the co-benefit of being based on a quantification of emissions, is to compare a project's emissions as proposed to that project's emissions if it were to be built using BAU design,

Website www.caleemod.com.

Raju Associates, Inc., Transportation Study for the Lincoln Properties Project—100 W. Walnut Street Environmental Impact Report, March 21, 2014. See Appendix B of this Draft EIR.

methodology, and technology. If a project constitutes an equivalent or larger break from BAU than has been determined by CARB to be necessary to meet AB 32's goals for 2020, then that project can be considered consistent with AB 32 and, therefore, will not have a significant impact on the environment due to its GHG emissions. While not project-specific, 16 percent is the average level of emissions reduction performance that would need to be achieved across all sectors of the economy to meet AB 32 goals. As CARB's *Climate Change Scoping Plan* is predicated on the reduction from BAU methodology to determine consistency with AB 32, this section replicates the same methodology for evaluating the proposed Project to determine consistency with AB 32.

Evaluating the proposition that a project constitutes a break from BAU requires providing a quantitative estimate of BAU based on the specific circumstances of the project in the context of relevant State activities and mandates. This essentially requires three GHG emissions inventories (as follows):

- Baseline, existing environmental setting, GHG emissions;
- BAU project GHG emissions; and
- "As proposed" project GHG emissions with project design features.

The analysis in this section includes potential emissions under BAU scenarios and from the Project at build-out based on actions and mandates expected to be in force in 2020.

Local governments as well as others use 2020 as a target date for GHG reductions. It is also an important target date for supporting legislation and regulation, including mandates for implementation of the Low Carbon Fuel Standard and the Federal Corporate Average Fuel Economy standards. This 2020 target date reflects California's AB 32 mandate for GHG emissions reductions based on the following CARB timeline⁴³:

- January 1, 2009: CARB adopts a "scoping plan" indicating how emissions reductions will be achieved.
- January 1, 2010: Early-action measures take effect.
- January 1, 2012: GHG rules and market mechanisms adopted by CARB are legally enforceable.

⁴³ California Air Resources Board, www.arb.ca.gov/cc/cc.htm.

• December 31, 2020: Deadline for achieving the 2020 GHG emission cap.

The 2020 BAU forecasts provided in CARB's Climate Change Scoping Plan provides a "top-down" approach to inventory development in which data are collected in the aggregate for the entire state.44 2020 BAU employment and population growth rates were developed by the State of California Department of Finance and are based on census data and data provided by Metropolitan Planning Organizations (MPOs). With regard to the City of Pasadena, SCAG is the designated MPO. SCAG's forecast of employment and population growth that was provided to the state for these purposes is based on input provided to SCAG by the City which reflects the growth assumptions included in the City's General Plan Land Use Element for the Central District. The proposed Project is consistent with these growth projections. CARB's Climate Change Scoping Plan recognizes that statewide growth, including growth in the City and the Central District in particular, is projected to occur and that a 16 percent reduction in BAU emissions would be required by 2020 to return to 1990 levels. As discussed above, this analysis replicates the same BAU methodology for evaluating the proposed Project to determine consistency with AB 32.

The BAU scenario does not consider site-specific conditions, project design features, or prescribed mitigation measures. As an example, a BAU scenario would apply a base ITE trip-generation rate for the project and would not consider site-specific benefits resulting from the proposed mix of uses or close proximity to public transportation. The analysis below establishes BAU as complying with the minimum performance level required under Title 24. But consistent with the *Supplemental FED*'s calculation of the 16-percent reduction below BAU required to meet AB 32's mandate, the BAU scenario here does consider state mandates that were already in place when CARB prepared the *Supplemental FED* (e.g., Pavley I Standards, full implementation of California's Statewide Renewables Portfolio Standard beyond current levels of renewable energy, and the California Low Carbon Fuel Standard). In addition, the BAU scenario only includes GHG emission reduction measures required under Title 24 and does not consider further reduction measures from the 2008 CalGreen Code or 2013 CALGreen Code.

Emissions calculations for the Project include credits or reductions for the project features set forth in this Draft EIR, such as reductions in energy or water demand. In addition, as mobile source GHG emissions are directly dependent on the number of vehicle trips, a decrease in the number of Project generated trips as a result of project features will provide a proportional reduction in mobile source GHG emissions. This scenario conservatively did not include actions and mandates that are not already in place but are

⁴⁴ California Air Resources Board, www.arb.ca.gov/cc/inventory/archive/forecast_archive.htm

expected to be in force in 2020 (e.g., Pavley II), which could further reduce GHG emissions from the use of light-duty vehicles (e.g., cars and small trucks) by 2.5 percent.

c. Regulatory Compliance Measures and Project Design Features

(1) Regulatory Compliance Measures

The Project would comply with all applicable regulatory standards. Implementation of the following Regulatory Compliance Measure, as currently required and/or as may be amended in the future, is intended to reduce impacts related to GHG emissions:

Regulatory Compliance Measure G-1: In accordance with the City of Pasadena Municipal Code (Chapter 14), as amended pursuant to City of Pasadena Ordinance No. 7234), the Project is required to comply with various provisions of the 2013 CALGreen Code. Specific mandatory requirements for nonresidential and high-rise residential buildings are provided in Appendix E of this Draft EIR.

(2) Project Design Features

The proposed Project's scale, density and mix of uses, offers a range of opportunities to incorporate sustainable design practices into the design and operation of the proposed Project. The Project Site's adjacencies to public transit, urban parks and Old Pasadena, a pedestrian oriented center, all contribute to the Project's sustainable features as a transit oriented mixed use development that also preserves and integrates the existing on-site structures.

At a macro scale, the Project is located less than 0.25 mile from a major transit hub, the Metro Gold Line Memorial Park Station. Commuting to and from the Project Site is further enhanced by an extensive bike network that links the Project Site to the broader civic district and other parts of the City and beyond. The Project's open space network would also link to existing pedestrian networks on the Project perimeter further enhancing the pedestrian oriented nature of the proposed Project. The Project's new mixed use environment and increased density represents the revitalization of an important site located adjacent to Old Pasadena.

The following specific Project Design Features are proposed with regard to GHG emissions:

Project Design Feature G-1: The design of the new buildings shall incorporate features to be capable of achieving at least Silver certification under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED)-CS® or LEED-NC® Rating System as of January 1, 2011. Such LEED® features shall include energy-efficient buildings, a pedestrian- and bicycle-friendly site design, and water conservation measures, among others.

Project Design Feature G-2: The Project would prohibit hearths (woodstove and fireplaces) installed in the residences.

The Project would also include water conservation and waste reduction features as set forth in Section IV.L.1, Utilities and Service Systems—Water Supply, and Section IV.L.3, Utilities and Service Systems—Solid Waste, of this Draft EIR, respectively.

d. Analysis of Project Impacts

The Project would have the potential to result in direct and indirect GHG emissions generated by different types of buildings, land uses, and emissions sources, potentially including:

- Construction: emissions associated with demolition, site preparation, excavation, grading, and construction-related equipment and vehicular activity;
- Area Source: emissions associated with consumer products and landscape equipment;
- Transportation: emissions associated with Project-generated vehicular operations;
- Building operations: emissions associated with space heating and cooling, water heating, and lighting;
- Water: emissions associated with energy used to pump, convey, deliver, and treat water; and
- Solid waste: emissions associated with waste streams (embodied energy of materials).

While the Project would generate an incremental contribution to and cumulative increase in sources of GHGs; the Project would result in a net decrease in GHG emissions compared to BAU, as discussed below. However, it should be noted that even a very large individual project would not generate enough GHG emissions on its own to significantly influence global climate change. Specific discussion regarding potential GHG emissions associated with the construction and operational phases of the Project is provided below.

City of Pasadena SCH No. 2013071018

(1) Construction Impacts

GHG emissions during construction were forecasted by assuming a conservative start date (i.e., assuming all construction occurs at the earliest feasible date) and calculated using CalEEMod. Details of the modeling assumptions and emission factors are provided in Appendix E of this Draft EIR. The calculations of the emissions generated during Project construction activities reflect the number of haul/delivery truck trips, employee trips, and types and quantities of construction equipment that would be used to reconstruct the onsite segment of Holly Street and Leonard J. Pieroni Street, remove the existing asphalt, excavate for the subterranean parking structure, construct the proposed buildings, and plant new landscaping, within the Project Site.

As described in detail in Section II, Project Description, the Project is proposed to be developed in two phases, with buildout of Phases 1 and 2 planned for 2016 and 2020, respectively. Phase 1 consists of Development Areas A and B, whereas Phase 2 consists of Development Area C. Construction for each development phase is anticipated to be completed within an approximate 24-month timeframe, with the first 6 months consisting of grading and excavation for the subterranean parking structure and the remaining 18 months for building construction and finishing. Based on current market conditions, the construction of Phase 1 would be completed before the start of Phase 2 construction. Off-site haul trips would primarily occur during the excavation phase to remove soil materials required for the construction of the Project's subterranean parking structure.

As presented in Table IV.G-4 on page IV.G-36, construction of the Project is estimated to generate 5,560 and 4,841 metric tonnes of CO₂e during Phase 1 and Phase 2 construction, respectively. As recommended by the SCAQMD, the total GHG construction emissions were amortized over the 30-year lifetime of the Project (i.e., total construction GHG emissions were divided by 30 to determine an annual construction emissions estimate that can be added to the Project's operational emissions) in order to determine the project's annual GHG emissions inventory.⁴⁵ Based on this methodology, amortized construction GHG emissions would be 347 metric tonnes of CO₂e per year. A complete listing of the construction equipment by on-site and off-site activities, duration, and emissions estimation model input assumptions used in this analysis is included within the emissions calculation worksheets that are provided in Appendix E of this Draft EIR.

⁴⁵ SCAQMD Governing Board Agenda Item 31, December 5, 2008

Table IV.G-4 Construction-Related Emissions (metric tonnes of CO₂e)

Construction Year	Metric Tonnes CO₂e		
Phase 1			
Year 2015	2,589		
Year 2016	2,971		
Subtotal	5,560		
Phase 2			
Year 2019	2,066		
Year 2020	2,775		
Subtotal	4,841		
Combined Phases 1 and 2 Total	10,401		
Amortized Over 30 Years	347		
Source: Matrix Environmental, 2014.			

(2) Operational Impacts

(a) Area Source Emissions

Area source emissions were calculated using the CalEEMod emissions inventory model, which includes hearths and landscape maintenance equipment. CalEEMod default values for this category of sources and emission factors were used for the BAU scenario. As an example, the number and types of hearths and the amount of wood/natural gas burned per year was based on data supplied by the SCAQMD. Because the Project would prohibit the installation of hearths within the Project's residential units, the reduction in GHG emissions from the implementation of Project Design Feature G-2 were calculated and are shown in Table IV.G-5 on page IV.G-37. As shown in Table IV.G-5, the Project is forecasted to result in a total of 16 metric tonnes of CO₂e per year from area sources during Phase 1 and Buildout, which would be a reduction of approximately 90 percent in comparison to the BAU scenario for this particular category of GHG emissions.

(b) Mobile Source Emissions

Mobile source operational emissions were calculated based on the project trip generation estimates provided for the Project by Raju Associates, Inc. 46 As discussed in

Raju Associates, Inc., Transportation Study for the Lincoln Properties Project—100 W. Walnut Street Environmental Impact Report, March 21, 2014. See Appendix B of this Draft EIR.

Table IV.G-5 Annual GHG Emissions Summary (metric tonnes of CO₂e)

Scope	"Business-as- Usual" Project	Project	Difference	Project's Break from "Business-as-Usual"
Phase 1				
Area	160	16	144	-89.8%
Energy	7,542	6,733	809	-10.7%
Mobile	6,399	4,826	1,574	-24.6%
Solid Waste	192	192	0	0.0%
Water/Wastewater	1,148	899	249	-21.7%
Construction	185	185	0	0.0%
Total Emission	15,627	12,851	2,776	-17.8%
Buildout				•
Area	160	16	144	-89.8%
Energy	16,002	14,155	1,846	-11.5%
Mobile	9,813	7,601	2,212	-22.5%
Solid Waste	366	366	0	0.0%
Water/Wastewater	2,331	1,825	506	-21.7%
Construction	347	347	0	0.0%
Total Emission	29,017	24,310	4,707	-16.2%

Section IV.B, Transportation, of this Draft EIR, to calculate daily trips, the number of dwelling units for the residential use and the amount of building area for the commercial use were multiplied by the applicable trip generation rates based on the Institute of Transportation Engineers (ITE)'s, *Trip Generation, 9th Edition*. The BAU scenario was then adjusted to account for Project Design Features. The Project trip-generation estimate accounts for internal capture (i.e., synergy of proposed mix of land uses) and close proximity to a transit station (less than 0.25 miles from a major transit hub, the Metro Gold Line Memorial Park Station). Please refer to Section IV.B, Transportation, of the Draft EIR

for more details regarding the Project's trip generation characteristics.

As shown in Table IV.G-5, Phase 1 of the Project is forecasted to result in a total of 4,826 metric tonnes of CO_2e per year from mobile sources, which would be a reduction of approximately 24.6 percent in comparison to the BAU scenario. Buildout of the Project is forecasted to result in a total of 7,601 metric tonnes of CO_2e per year from mobile sources, which would be a reduction of approximately 22.5 percent in comparison to the BAU scenario.

(c) Electricity and Natural Gas

GHGs are emitted as a result of activities in buildings when electricity and natural gas are used as energy sources. Combustion of any type of fuel emits CO_2 and other GHGs directly into the atmosphere; when this occurs in a building, it is a direct emission source associated with that building. GHGs are also emitted during the generation of electricity from fossil fuels. When electricity is used in a building, the electricity generation typically takes place off-site at the power plant; thus, electricity use in a building generally causes emissions in an indirect manner.

Electricity and natural gas emissions were calculated using the CalEEMod emissions inventory model, which multiplies an estimate of the energy usage by applicable emissions factors chosen by the utility company. GHG emissions from electricity use are directly dependent on the electricity utility provider. In this case, GHG intensity factors for Pasadena Water and Power (PWP) were selected in CalEEMod. Energy use in buildings is divided into energy consumed by the built environment and energy consumed by uses that are independent of the construction of the building, such as in plug-in appliances. CalEEMod calculates energy use from systems covered by Title 24 (e.g., heating, ventilation, and air conditioning [HVAC] system, water heating system, and lighting system); energy use from lighting; and energy use from office equipment, appliances, plugins, and other sources not covered by Title 24 or lighting. CalEEMod default electricity and natural gas usage rates for each applicable land use were selected for the BAU scenario in this analysis. As such, the BAU scenario did not assume further reductions related to the 2008 CALGreen code or the 2013 CALGreen code which is consistent with the methodology provided in the updated CARB 2020 BAU projection in the Supplemental FED. Consistent with Regulatory Compliance Measure G-1 (Compliance with specific mandatory requirements of CALGreen Code), a 15 percent minimum reduction in energy use from systems covered by Title 24 and lighting was applied to both Phase 1 and Project Buildout.

As shown in Table IV.G-5 on page IV.G-37, Phase 1 of the Project is forecasted to result in a total of 6,733 metric tonnes of CO₂e per year from energy sources, which would be a reduction of approximately 10.7 percent in comparison to the BAU scenario as a result of compliance with Regulatory Compliance Measure G-1. Buildout of the Project is expected to result in a total of 14,155 metric tonnes of CO₂e per year from energy sources, which would be a reduction of approximately 11.5 percent in comparison to the BAU scenario.

(d) Water Usage and Wastewater Generation Emissions

GHG emissions also occur from the energy used to convey, treat and distribute water and wastewater. Thus, these emissions are generally indirect emissions from the

City of Pasadena SCH No. 2013071018

production of electricity to power these systems. Three processes are necessary to supply potable water: (1) supply and conveyance of the water from the source; (2) treatment of the water to potable standards; and (3) distribution of the water to individual users. After use, the wastewater is treated, with some of it reused as reclaimed water.

Emissions related to water usage and wastewater generation were calculated using the CalEEMod emissions inventory model, which multiplies an estimate of the water usage by the applicable energy intensity factor to determine the embodied energy necessary to supply potable water. GHG emissions are then calculated based on the amount of electricity consumed multiplied by the GHG intensity factors for the utility provider. In this case, embodied energy for Southern California supplied water (which includes water delivered by PWP) and GHG intensity factors for PWP were selected in CalEEMod. Please refer to Section IV.L-1, Utilities and Service Systems—Water Supply, and Section IV.L-2, Utilities and Service Systems—Wastewater, of this Draft EIR for additional details on the Project's potential impacts to water supply and wastewater service. Consistent with Regulatory Compliance Measure G-1 (Compliance with specific mandatory requirements of CALGreen Code), a 20 percent minimum reduction in water usage and wastewater generation was applied to the Project.

As shown in Table IV.G-5 on page IV.G-37, Phase 1 of the Project is forecasted to result in 899 metric tonnes of CO₂e per year from water usage and wastewater generation, which would be a reduction of approximately 22 percent in comparison to the BAU scenario and is a result of compliance with Regulatory Compliance Measure G-1. Buildout of the Project is forecasted to result in 1,825 metric tonnes of CO₂e per year from water usage and wastewater generation, which would be a reduction of approximately 22 percent in comparison to the BAU scenario.

(e) Solid Waste

Emissions related to solid waste were calculated using the CalEEMod emissions inventory model, which multiplies an estimate of the waste generated by applicable emissions factors provided in Section 2.4 of AP-42. CalEEMod default solid waste generation rates for each applicable land use were selected for this analysis. As shown in Table IV.G-5, Phase 1 of the Project is forecasted to result in 185 metric tonnes of CO₂e from solid waste generation. Buildout of the Project is forecasted to result in 347 metric tonnes of CO₂e from solid waste generation. Please refer to Section IV.L-3, Utilities and Service Systems—Solid Waste, of this Draft EIR for additional details on the Project's potential impacts with regard to solid waste generation.

(3) Combined Construction and Operational Impacts

As shown in Table IV.G-5 on page IV.G-37, the GHG emissions for the Project take into consideration implementation of the project design features, the requirements set forth in the City of Pasadena Building Code, and full implementation of current State mandates. Table IV.G-5 illustrates that the Project has incorporated sustainability design features to reduce VMTs and the Project's potential impact with respect to GHG emissions. With implementation of the Regulatory Compliance Measures and project design features, Phase 1 development would result in 17.8 percent less GHG emissions than under BAU conditions, whereas GHG emissions at Project buildout would be 16.2 percent less than under BAU conditions. As both Phase 1 and Project buildout would result in a greater than 16 percent reduction in GHG emissions compared to BAU conditions, Project impacts with regard to GHG emissions would be less than significant. Thus, the Project's design features and GHG reduction measures result in the Project being consistent with the goals of AB 32.

(4) Project Consistency with GHG Reduction Plans and Policies

The Project is designed with a number of features that implement the policies pertaining to GHG emissions included in GHG reduction plans and policies. As discussed in detail above and in Section IV.A, Land Use, and Section IV.B, Transportation, of this Draft EIR, the Project would reduce greenhouse gas emissions in the Pasadena region with implementation of project features that would reduce vehicular trips, reduce vehicle miles traveled, and encourage use of alternative modes of transportation. The underlying purpose and goal of the proposed Project is to transform the Project Site from a single-function office complex, which features the 12-story Parsons Corporation tower, to a mixed-use office campus and residential community that is integrated into the City of Pasadena's unique urban context. The Project Site's adjacencies to public transit, urban parks and Old Pasadena, a pedestrian oriented center, all contribute to the Project's ability to reduce vehicle trips and vehicle miles traveled as a transit oriented mixed use development that also preserves and integrates the existing on-site structures.

The Project would also exceed Title 24, Part 6, California Energy Code baseline standard requirements for energy efficiency, based on the 2008 Energy Efficiency Standards requirements, by 15 percent. Examples of design methods and technologies that are anticipated to be implemented include, but are not limited to, high performance glazing on windows, high efficiency boilers, and enhanced insulation to minimize solar and thermal gain. The Project would also apply energy-saving technologies and components to reduce the Project's electrical use-profile. Examples of these components include energy saving lighting schemes such as motion-detection controls (where applicable), and energy-efficient heating and cooling equipment. In addition, the Project would improve water efficiency in buildings and reduce per-capita water use with measures, such as

City of Pasadena SCH No. 2013071018

high-efficiency toilets and faucets, to reduce water use. Water efficient landscaping measures would also be incorporated into the Project and would include measures such as centralized and weather-responsive irrigation controls and maximized use of native/adapted/drought tolerant plants.

(a) CARB's Climate Change Scoping Plan

Table IV.G-5 on page IV.G-37 illustrates that implementation of the Project Design Features and compliance with State mandates would contribute to GHG reductions. These reductions represent a reduction from BAU and support State goals for GHG emissions reduction. The methods used to establish this relative reduction are consistent with the approach used in CARB's *Climate Change Scoping Plan* for the implementation of AB 32.

The Project is consistent with the approach outlined in CARB's *Climate Change Scoping Plan*, particularly its emphasis on the identification of emission reduction opportunities that promote economic growth while achieving greater energy efficiency and accelerating the transition to a low-carbon economy. The Project would transform a single-use, suburban-style campus in an urbanized area adjacent to Old Pasadena, which is defined by centralized buildings and large expanses of surface parking, into a mixed-use urban infill development that is pedestrian- and transit-oriented, as well as high-density in character. In addition, as recommended by CARB's *Climate Change Scoping Plan*, the Project would use "green building" features as a framework for achieving emissions reductions through compliance with the 2013 CALGreen code.

(b) SCAG's 2012-2035 SCS/RTP

As part of SCAG's 2012-2035 SCS/RTP, a reduction in VMT within the region is a key component to achieve the 2020 and 2035 GHG emission reduction targets established by CARB. Mobile source GHG emissions are directly proportional to VMT. As shown in Table IV.G-5, the Project results in a mobile source reduction of 24.6 percent under Phase 1 of the Project and 22.5 percent under buildout of the Project in comparison to BAU. The Project is an infill development in an urban area that is well served by public transit. As such, the Project would successfully integrate land use and transportation planning principles by focusing growth in an existing and emerging activity center that is well-served by public transit and located along major transportation corridors (i.e., the 210, 134, and 710 freeways as well as Fair Oaks and Pasadena Avenues and Walnut Street). A combination of 18 different bus lines and the Metro Gold rail line together provide extensive public transit service in the Project area. The availability and accessibility of public transit in the Project area is evidenced by the Project Site's location within a designated High Quality Transit Area (HQTA) in the 2012–2035 RTP/SCS. The Project's scale, density, and mix of uses also offers a range of opportunities to incorporate sustainable design practices into the design and operation of the Project that also implement the policies set forth in the

City of Pasadena SCH No. 2013071018

Citywide and Central District Design Guidelines which have been incorporated into the Project. The Project Site's adjacency to public transit, urban parks, and Old Pasadena, a pedestrian oriented center, all contribute to the Project's sustainable nature as a transit-oriented, mixed-use development that also preserves and integrates with the existing on-site structures. Therefore, the GHG and corresponding VMT reduction of Phase 1 and buildout of the Project would be consistent with the SCS/RTP. Please refer to Section IV.A, Land Use, and Section IV.B, Transportation, of this Draft EIR for additional discussion on how the Project would be consistent with SCAG's 2012–2035 SCS/RTP.

Based upon this evaluation, it is concluded that the Project would be consistent with City of Pasadena policies pertaining to greenhouse gas as it implements the goals and policies set forth in the City's General Plan and Land Use and Mobility Element Update. Thus, the Project meets or exceeds applicable policies of the City of Pasadena with regard to GHG emissions and reductions thereof.

(c) City of Pasadena General Plan and Building Code

As described above, the Project is designed with a number of features that implement the policies pertaining to GHG emissions included in the adopted City of Pasadena General Plan. The Project also would comply with the City of Pasadena Building Code, which emphasizes improving energy conservation and energy efficiency, increasing renewable energy generation, and changing transportation and land use patterns to reduce auto dependence. The Project's design features would advance these objectives.

As described above, the Project contains Project Design Features that would reduce the Project's GHG emissions profile and would represent improvements in relation to BAU conditions. The Project's GHG emissions reduction of 17.8 percent under Phase 1 and 16.2 percent under buildout of the Project compared to the BAU scenario constitutes an equivalent or larger break from BAU than has been determined by CARB to be necessary to meet AB 32's goals (i.e., 16 percent reduction).⁴⁷ Therefore, the Project would not have a significant impact on the environment due to its GHG emissions. In addition, given the Project's consistency with State, SCAG, and City of Pasadena GHG emission reduction goals and objectives, the Project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. In the absence of adopted standards and established significance thresholds, and given this

As discussed above, the Project scenario conservatively did not include actions and mandates that are not already in place but are expected to be in force in 2020 (e.g., Pavley II), which could further reduce GHG emissions from use of light-duty vehicles by 2.5 percent.

consistency, the Project's contribution to global climate change would be less than significant.

(5) Potential Impacts of Climate Change at the Project Site

Climate change could potentially result in changes that directly impact the Project Site (e.g., fire danger, rise in sea level, and damage to marine and other ecosystems). Given that the Project Site is approximately 22 miles from the Pacific Ocean and over 800 feet above sea level, the proposed Project would not result in a risk from rising sea levels or damage to marine and other ecosystems. In addition, the Project Site is in an urbanized area and is considered a low fire hazard area according to the City's General Plan Safety Element. Therefore, potential impacts of climate change at the Project Site would be less than significant.

4. Cumulative Impacts

Although the Project is expected to emit GHGs, the emission of GHGs by a single project into the atmosphere is not itself necessarily an adverse environmental effect. Rather, it is the increased accumulation of GHG from more than one project and many sources in the atmosphere that may result in global climate change. consequences of that climate change can cause adverse environmental effects. project's GHG emissions typically would be very small in comparison to state or global GHG emissions and, consequently, they would, in isolation, have no significant direct impact on climate change. The State has mandated a goal of reducing statewide emissions to 1990 levels by 2020, even though statewide population and commerce is predicted to continue to expand. In order to achieve this goal, CARB is in the process of establishing and implementing regulations to reduce statewide GHG emissions. However, currently there are no applicable CARB or SCAQMD significance thresholds or specific reduction targets, and no approved policy or guidance to assist in determining impact significance at the project or cumulative levels. Additionally, there is currently no generally accepted methodology to determine whether GHG emissions associated with a specific project represents new emissions or existing, displaced emissions.

Table IV.G-5 on page IV.G-37 illustrates that implementation of the Project Design Features and compliance with State mandates would contribute to GHG reductions. These reductions represent a reduction from BAU and support State goals for GHG emissions reduction. The methods used to establish this relative reduction are consistent with the approach used in the CARB's *Climate Change Scoping Plan* for the implementation of AB 32.

As discussed above, the Project would be consistent with State, SCAG, and City of Pasadena GHG emission reduction goals and objectives and the Project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. In the absence of adopted standards and established significance thresholds, and given the Project's consistency with State, County, and City greenhouse gas emission reduction goals and objectives, the contribution to the cumulative impact of global climate change would be less than significant.

5. Mitigation Measures

As part of the Project, the Applicant would incorporate project design features to further support and promote environmental sustainability. The Project also would comply with applicable regulatory requirements, including the provisions set forth in the 2013 CALGreen Code that have been incorporated into the City of Pasadena Green Building Code. The Project would also include water conservation and waste reduction features, as set forth in Section IV.L.1, Utilities and Service Systems—Water Supply, and Section IV.L.3, Utilities and Service Systems—Solid Waste, of this Draft EIR, respectively.

With implementation of the project design features described above and compliance with regulatory requirements, impacts related to climate change would be less than significant, and no mitigation measures are recommended or required.

6. Level of Significance After Mitigation

With implementation of the Project Design Features and State mandates, impacts with regard to climate change attributable to Phase 1 and Phase 2 development, as well as at Project buildout, would be less than significant.