

## 4.7 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

This chapter presents a summary of the current state of climate change science and greenhouse gas (GHG) emissions sources in California; a summary of applicable regulations; quantification of project-generated GHG emissions and discussion about their potential contribution to global climate change; and analysis of the project's resiliency to climate change-related risks.

### 4.7.1 Regulatory Background

#### FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

##### **National Program to Cut Greenhouse Gas Emissions and Improve Fuel Economy for Cars and Trucks**

On August 28, 2014, the U.S. Environmental Protection Agency (EPA) and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) finalized a new national program that would reduce GHG emissions and improve fuel economy for all new cars and trucks sold in the U.S. (NHTSA 2012). EPA proposed the first-ever national GHG emissions standards under the federal Clean Air Act, and NHTSA proposed Corporate Average Fuel Economy standards under the Energy Policy and Conservation Act. This national program requires automobile manufacturers to build a single light-duty national fleet that meets all requirements under both federal programs and the standards of California and other states. This program will increase fuel economy to the equivalent of 54.5 miles per gallon (mpg) for the fleet of cars and light-duty trucks by model year 2025, and, as of 2016, NHTSA and EPA are developing additional phases to address GHG emission standards for new medium- and heavy-duty trucks (NHTSA 2016). This program is currently under review by EPA, but at the time of publication of this DEIR had not been changed.

#### STATE PLANS, POLICIES, REGULATIONS, AND LAWS

##### **Executive Order S-3-05**

Executive Order (EO) S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established total GHG emission targets for the state. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

While dated, this executive order remains relevant because a more recent California Appellate Court decision, *Cleveland National Forest Foundation v. San Diego Association of Governments* (November 24, 2014) 231 Cal.App.4th 1056, examined whether it should be viewed as having the equivalent force of a legislative mandate for specific emissions reductions. The case is being reviewed by the California Supreme Court and oral arguments have been presented; however, a decision had not been released at the time of writing this DEIR. Therefore, the Appellate Court decision is not currently considered a citable precedent.

##### **Assembly Bill 32, the California Global Warming Solutions Act of 2006**

In September 2006, Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006, Assembly Bill (AB) 32. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also requires that these reductions "...shall remain in effect unless otherwise amended or repealed. (b) It is the intent of the Legislature that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue

reductions in emissions of greenhouse gases beyond 2020. (c) The [Air Resources Board] shall make recommendations to the Governor and the Legislature on how to continue reductions of greenhouse gas emissions beyond 2020.” [California Health and Safety Code, Division 25.5, Part 3, Section 38551]

### **Assembly Bill 32 Climate Change Scoping Plan and Updates**

In December 2008, the California Air Resources Board (CARB) adopted its Climate Change Scoping Plan, which contains the main strategies California will implement to achieve reduction of approximately 118 million metric tons (MMT) of CO<sub>2</sub>-equivalent (CO<sub>2</sub>e) emissions, or approximately 21.7 percent from the State’s projected 2020 emission level of 545 MMT of CO<sub>2</sub>e under a business-as-usual scenario (this is a reduction of 47 MMT CO<sub>2</sub>e, or almost 10 percent, from 2008 emissions). In May 2014, CARB released and subsequently adopted the *First Update to the Climate Change Scoping Plan* to identify the next steps in reaching AB 32 goals and evaluate progress that has been made between 2000 and 2012 (CARB 2014a:4 and 5). According to the update, California is on track to meet the near-term 2020 GHG limit and is well positioned to maintain and continue reductions beyond 2020 (CARB 2014a:ES-2). The update also reports the trends in GHG emissions from various emissions sectors (e.g., transportation, building energy, agriculture).

On January 20, 2017, CARB released its proposed 2017 Climate Change Scoping Plan Update (2017 Scoping Plan Update), which lays out the framework for achieving the 2030 reductions as established in more recent legislation (discussed below). The proposed 2017 Scoping Plan Update identifies the GHG reductions needed by each emissions sector to achieve a statewide emissions level that is 40 percent below 1990 levels before 2030.

The proposed update also identifies how GHGs associated with proposed projects could be evaluated under CEQA. Specifically, it states that achieving “no net increase” in GHG emissions is the correct overall objective of projects evaluated under CEQA if conformity with an applicable local GHG reduction plan cannot be demonstrated. CARB recognizes that it may not be appropriate or feasible for every development project to mitigate its GHG emissions to no net increase and that this may not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change. In terms of current project-level thresholds, neither the Sacramento Metropolitan Air Quality Management District (SMAQMD) nor the City of Sacramento have developed an evidenced-based, bright-line numeric threshold consistent with the State’s long-term 2030 GHG goal. At the time of writing this environmental document, CARB has not yet approved its proposed 2017 Scoping Plan Update.

### **Senate Bill 375**

Senate Bill (SB) 375, signed by Governor Schwarzenegger in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires metropolitan planning organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy, showing prescribed land use allocation in each MPO’s Regional Transportation Plan. CARB, in consultation with the MPOs, is to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

The Sacramento Area Council of Governments (SACOG) serves as the MPO for Sacramento, Placer, El Dorado, Yuba, Sutter, and Yolo Counties, excluding those lands located in the Lake Tahoe Basin. The project site is in Sacramento County. SACOG adopted its Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) 2035 in 2012, and completed an update adopted on February 18, 2016. SACOG was tasked by CARB to achieve a 9 percent per capita reduction compared to 2012 emissions by 2020 and a 16 percent per capita reduction by 2035, which CARB confirmed the region would achieve by implementing its SCS (CARB 2013).

### **Executive Order B-30-15**

On April 20, 2015 Governor Brown signed EO B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor’s EO aligns California’s GHG reduction targets with those of leading international governments such as the 28-nation European Union, which adopted the same target in October 2014. California is on track to meet or exceed the target of reducing GHG emissions to 1990

levels by 2020, as established in the California Global Warming Solutions Act of 2006 (Assembly Bill 32, discussed above). California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2 degrees Celsius, the warming threshold at which major climate disruptions are projected, such as super droughts and rising sea levels.

### **Senate Bill 32 and Assembly Bill 197 of 2016**

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the State's continuing efforts to pursue the long-term target expressed in EOs S-3-05 and B-30-15 of 80 percent below 1990 emissions levels by 2050.

### **Advanced Clean Cars Program**

In January 2012, CARB approved the Advanced Clean Cars program which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of standards for vehicle model years 2017 through 2025. The new rules strengthen the GHG standard for 2017 models and beyond. This will be achieved through existing technologies, the use of stronger and lighter materials, and more efficient drivetrains and engines. The program's zero-emission vehicle regulation requires battery, fuel cell, and/or plug-in hybrid electric vehicles to account for up to 15 percent of California's new vehicle sales by 2025. The program also includes a clean fuels outlet regulation designed to support the commercialization of zero-emission hydrogen fuel cell vehicles planned by vehicle manufacturers by 2015 by requiring increased numbers of hydrogen fueling stations throughout the state. The number of stations will grow as vehicle manufacturers sell more fuel cell vehicles. By 2025, when the rules will be fully implemented, the statewide fleet of new cars and light trucks will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions than the statewide fleet in 2016 (CARB 2012).

### **Senate Bill X1-2, the California Renewable Energy Resources Act of 2011**

SB X1-2 of 2011 requires all California utilities to generate 33 percent of their electricity from renewables by 2020. SB X1-2 sets a three-stage compliance period requiring all California utilities, including independently-owned utilities, energy service providers, and community choice aggregators, to generate 20 percent of their electricity from renewables by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020. SB X1-2 also requires the renewable electricity standard to be met increasingly with renewable energy that is supplied to the California grid from sources within, or directly proximate to, California. SB X1-2 mandates that renewables from these sources make up at least 50 percent of the total renewable energy for the 2011-2013 compliance period, at least 65 percent for the 2014-2016 compliance period, and at least 75 percent for 2016 and beyond. In October 2015, SB 350 was signed by Governor Brown, which requires retail sellers and publicly-owned utilities to procure 50 percent of their electricity from renewable resources by 2030.

### **California Building Efficiency Standards of 2016 (Title 24, Part 6)**

Buildings in California are required to comply with California's Energy Efficiency Standards for Residential and Nonresidential Buildings established by the California Energy Commission (CEC) regarding energy conservation standards and found in Title 24, Part 6 of the California Code of Regulations. These standards were first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption and are updated on an approximately 3-year cycle to allow consideration and possible incorporation of new energy efficient technologies and methods. All buildings for which an application for a building permit is submitted on or after January 1, 2017 must follow the 2016 standards (CEC 2015). Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions.

## California Integrated Waste Management Act

To minimize the amount of solid waste that must be disposed of in landfills, the State Legislature passed the California Integrated Waste Management Act of 1989 (AB 939), effective January 1990. According to AB 939, all cities and counties were required to divert 25 percent of all solid waste from landfill facilities by January 1, 1995, and 50 percent by January 1, 2000. Through other statutes and regulations, this 50 percent diversion rate also applies to State agencies. In order of priority, waste reduction efforts must promote source reduction, recycling and composting, and environmentally-safe transformation and land disposal. Per capita disposal rates for the City of Sacramento are below the target disposal rates established by AB 939 (1989; California Department of Resources Recycling and Recovery [CalRecycle] 2017).

In 2011, AB 341 modified the California Integrated Waste Management Act and directed CalRecycle to develop and adopt regulations for mandatory commercial recycling. The resulting Mandatory Commercial Recycling Regulation (2012) requires that on and after July 1, 2012, certain businesses that generate four cubic yards or more of commercial solid waste per week shall arrange recycling services. To comply with this requirement, businesses may either separate recyclables and self-haul them or subscribe to a recycling service that includes mixed waste processing. AB 341 also established a statewide recycling goal of 75 percent; the 50 percent disposal reduction mandate still applies for cities and counties under AB 939, the Integrated Waste Management Act.

## Executive Order B-18-12

In April 2012, Governor Brown signed Executive Order B-18-12 requiring State agencies to implement green building practices to improve energy, water and materials efficiency, improve air quality and working conditions for State employees, reduce costs to the State and reduce environmental impacts from State operations. Among other actions, EO B-18-12 requires State agencies to reduce agency-wide water use by 10 percent by 2015 and 20 percent by 2020, as measured against a 2010 baseline. The Executive Order directs that new State buildings larger than 10,000 square feet use clean, on-site power generation and obtain the U.S. Green Building Council's Leadership in Energy and Environmental (LEED) Silver certification. Further, EO B-18-12 states that all new State buildings beginning design after 2025 be constructed as Zero Net Energy (ZNE) facilities, with an interim target of 50 percent of new facilities beginning design after 2020 to be ZNE. The Executive Order also calls for State agencies to identify and pursue opportunities to provide electric vehicle charging stations at employee parking facilities in new buildings.

## LOCAL PLANS, POLICIES, REGULATIONS, AND LAWS

The Resources Building Replacement Project is located on State-owned property, has been authorized and funded by the State of California through the State Projects Infrastructure Fund, and would be implemented by the California Department of General Services (DGS). As explained in Section 4.2 "Land Use" of this DEIR, under Section 4.2.1 "Local Plans, Policies, Regulations, and Laws," State agencies are not subject to local plans, policies, and zoning regulations. Nevertheless, in the exercise of its discretion, DGS does reference, describe, and address local plans, policies, and regulations that are applicable to the project. This evaluation is also intended to be used by local agencies for determining, as part of their permit processes, the project's consistency with local plans, policies, and regulations.

## Sacramento Metropolitan Air Quality Management District

SMAQMD is the primary agency responsible for addressing air quality concerns in all of Sacramento County—its role is discussed further in Section 4.6, "Air Quality." SMAQMD also recommends methods for analyzing project-generated GHGs in CEQA analyses and offers multiple potential GHG reduction measures for land use development projects. SMAQMD developed thresholds of significance to provide a uniform scale to measure the significance of GHG emissions from land use and stationary source projects in compliance with CEQA and AB 32. SMAQMD's goals in developing GHG thresholds include ease of implementation; use of standard analysis tools; and emissions mitigation consistent with AB 32. However, since the passage of SB 32 and AB 197 and the associated adoption of a revised statewide emissions target of 40 percent below 1990 levels by 2030, SMAQMD has not developed new thresholds in compliance with this target.

## City of Sacramento

### City of Sacramento 2035 General Plan

The City of Sacramento 2035 General Plan includes the following policies related to reducing GHG emissions in Sacramento (City of Sacramento 2015).

- ▲ **Policy ER 6.1.5.** The City shall reduce community GHG emissions by 15 percent below 2005 baseline levels by 2020, and strive to reduce community emissions by 49 percent and 83 percent by 2035 and 2050, respectively.
- ▲ **Policy ER 6.1.7.** The City shall reduce greenhouse gas emissions from new development by discouraging auto-dependent sprawl and dependence on the private automobile; promoting water conservation and recycling; promoting development that is compact, mixed use, pedestrian friendly, and transit oriented; promoting energy-efficient building design and site planning; improving the job/housing ratio in each community; and other methods of reducing emissions.

### Sacramento Climate Action Plan

The Sacramento Climate Action Plan (CAP) was adopted on February 14, 2012 by the Sacramento City Council and was incorporated into the 2035 General Plan. The CAP includes GHG emission reduction targets, strategies, and implementation measures developed to help the city reach these targets. Reduction strategies address GHG emissions associated with transportation and land use, energy, water, waste management and recycling, agriculture, and open space. The City's goals related to transportation and energy use are described below.

- ▲ Improve accessibility and system connectivity by removing physical and operational barriers to safe travel.
- ▲ Reduce reliance on the private automobile.
- ▲ Use emerging transportation technologies and services to increase transportation system efficiency.
- ▲ Design, construct, and maintain a universally accessible, safe, convenient, integrated and well-connected pedestrian system that promotes walking.
- ▲ Create and maintain a safe, comprehensive, and integrated transit system as an essential component of a multimodal transportation system.
- ▲ Support the development and provision of privately funded and/or privately-operated transit services that support citywide and regional goals by reducing single-occupant vehicle (SOV) trips, vehicle miles traveled and GHG emissions.
- ▲ The City and other agencies within jurisdiction over roadways within City limits shall plan, design, operate and maintain all streets and roadways to accommodate and promote safe and convenient travel for all users – pedestrians, bicyclists, transit riders, and persons of all abilities, as well as freight and motor vehicle drivers.
- ▲ Enhance the quality of life within existing neighborhoods through the use of neighborhood traffic management and traffic calming techniques, while recognizing the City's desire to provide a grid system that creates a high level of connectivity.
- ▲ Maintain an interconnected system of streets that allows travel on multiple routes by multiple modes, balancing access, mobility and place-making functions with sensitivity to the existing and planned land use context of each corridor and major street segment.

- ▲ Create and maintain a safe, comprehensive, and integrated bicycle system and set of support facilities throughout the city that encourage bicycling that is accessible to all. Provide bicycle facilities, programs and services and implement other transportation and land use policies as necessary to achieve the City's bicycle mode share goal as documented in the Bicycle Master Plan.
- ▲ Provide and manage parking such that it balances the citywide goal of economic development, livable neighborhoods, sustainability, and public safety with the compact multi-modal urban environment prescribed by the General Plan.
- ▲ Provide for the energy needs of the city and decrease dependence on nonrenewable energy sources through energy conservation, efficiency, and renewable resource strategies.

## 4.7.2 Existing Conditions

### GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

#### The Physical Scientific Basis

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO<sub>2</sub>), methane, nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are found to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcing (Intergovernmental Panel on Climate Change [IPCC] 2014:3, 4).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas most pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the lifetime of any particular GHG molecule is dependent on multiple variables and cannot be determined with any certainty, it is understood that more CO<sub>2</sub> is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO<sub>2</sub> emissions, approximately 55 percent is estimated to be sequestered through ocean and land uptake every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO<sub>2</sub> emissions remains stored in the atmosphere (IPCC 2013:467).

The quantity of GHGs in the atmosphere that ultimately result in climate change is not precisely known, but is enormous; no single project alone would measurably contribute to an incremental change in the global average temperature, or to global, local, or micro climates. Thus, from the standpoint of CEQA, GHG impacts relative to global climate change are inherently cumulative.

## GREENHOUSE GAS EMISSION SOURCES

GHG emissions are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural emissions sectors (CARB 2014a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CARB 2014b). Emissions of CO<sub>2</sub> are byproducts of fossil fuel combustion. CH<sub>4</sub>, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. N<sub>2</sub>O is also largely attributable to agricultural practices and soil management. CO<sub>2</sub> sinks, or reservoirs, include vegetation and the ocean, which absorb CO<sub>2</sub> through sequestration and dissolution (CO<sub>2</sub> dissolving into the water), respectively, two of the most common processes for removing CO<sub>2</sub> from the atmosphere.

## EFFECTS OF CLIMATE CHANGE ON THE ENVIRONMENT

According to the IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3 to 7 degrees Fahrenheit (°F) by the end of the century, depending on future GHG emission scenarios (IPCC 2007). According to the California Natural Resources Agency (CNRA), temperatures in California are projected to increase 2 to 5 °F by 2050 and by 4 to 9 °F by 2100 (CNRA 2009).

Other environmental resources could be indirectly affected by the accumulation of GHG emissions and resulting rise in global average temperature. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. According to *Our Changing Climate* (CNRA 2012), the snowpack portion of the state's water supply could potentially decline 30 to 90 percent by the end of the 21st century. An increase in precipitation falling as rain rather than snow also could lead to increased potential for floods because water that would normally be held in the snowpack of the Sierra Nevada until spring would flow into the Central Valley concurrently with winter rainstorm events. This scenario would place more pressure on California's levee/flood control system.

As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available (CNRA 2012).

Changes in precipitation patterns and increased temperatures are expected to alter the distribution and character of natural vegetation and associated moisture content of plants and soils. An increase in frequency of extreme heat events and drought are also expected. These changes are expected to lead to increased frequency and intensity of wildfires (CNRA 2012).

Another outcome of global climate change is sea level rise. Sea level rose approximately seven inches during the last century and it is predicted to rise an additional seven to 22 inches by 2100, depending on the future levels of GHG emissions (IPCC 2007). CNRA projects that sea levels along California will rise 5 to 24 inches by 2050 and 17 to 66 inches by 2100 (CNRA 2012).

Cal-Adapt is a climate change scenario planning tool developed by CEC that downscales global climate model data to local and regional resolution under two emissions scenarios: the A-2 scenario represents a business-as-usual future emissions scenario, and the B-1 scenario represents a lower GHG emissions future. According to Cal-Adapt, annual average temperatures in the project area are projected to rise by 3.6 to 6.3 °F by 2090, with the range based on low and high emissions scenarios (Cal-Adapt 2017).

## 4.7.3 Environmental Impacts and Mitigation Measures

### ANALYSIS METHODOLOGY

GHG emissions associated with the proposed project would be generated during project construction and by operation of the facility after it is built. Estimated levels of construction- and operation-related GHGs are presented below. The project is evaluated for its consistency with adopted regulations, plans, and policies aimed at reducing GHG emissions. These include the proposed 2017 Scoping Plan Update, Executive Order B-18-12, the California Integrated Waste Management Act, and the City of Sacramento General Plan and Climate Action Plan.

#### Construction-Related Greenhouse Gas Emissions

Short-term construction-generated GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.1 computer program (CAPCOA 2016), as recommended by SMAQMD and other air districts in California. Modeling was based on project-specific information (e.g., building size, area to be graded, area to be paved, energy information) where available; assumptions based on typical construction activities; and default values in CalEEMod that are based on the project's location and land use type. Construction of the project was assumed to begin in 2018 and end in 2021, when the project would become operational.

#### Operational Greenhouse Gas Emissions

Project-related operational emissions of GHGs were estimated for the following sources: area sources (e.g., landscaping-related fuel combustion sources, emergency backup generator operation), energy use (i.e., electricity and natural gas consumption), water use, solid waste, and mobile sources. Operational mobile-source GHG emissions were modeled based on the estimated level of vehicle miles traveled (VMT) by employees and vendor deliveries. VMT estimates include new State and private sector employees (above existing staffing levels) that would occupy the proposed project site (approximately 1,300) and those who would backfill the renovated Resources Building (approximately 2,300). VMT estimates were derived from data generated in the traffic impact analysis conducted for the project (See Section 4.4, "Transportation and Circulation"). Mobile-source emissions were calculated using CalEEMod Version 2016.3.1. Indirect emissions associated with electricity and natural gas consumption were estimated using GHG emissions factors for the Sacramento Municipal Utility District (SMUD). The project's level of electricity and natural gas usage were based on 2016 Title 24-adjusted consumption rates provided by CalEEMod for a general office building, childcare center, retail, and food court land use types. GHG estimates also accounted for the supply of renewable electricity from an on-site 400 kilowatt-hour photovoltaic (PV) solar system, which is estimated to supply approximately 609,282 kilowatt hours of electricity annually to the project (National Renewable Energy Laboratory 2017). Project design features such as water-efficient plumbing fixtures, improved lighting efficiency, and waste diversion rates were accounted for in the emissions estimates.

Detailed model assumptions and inputs for these calculations can be found in Appendix G of this DEIR.

### THRESHOLDS OF SIGNIFICANCE

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

CEQA Guidelines Section 15064 and relevant portions of CEQA Guidelines Appendix G recommend that a lead agency consider a project's consistency with relevant, adopted plans, and discuss any inconsistencies with applicable regional plans, including plans to reduce GHG emissions. In Appendix G of the State CEQA Guidelines, two questions are provided to help assess if the project would result in a potentially significant impact on climate change. These questions ask whether the project would:

- ▲ generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or
- ▲ conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs?

This approach is consistent with one of the pathways to compliance presented in the recent California Supreme Court (Court) ruling, *Center for Biological Diversity v. California Department of Fish and Wildlife*. The Court identified three pathways to evaluate the cumulative significance of a proposed land use development. One pathway suggests assessing the degree to which a project complies with applicable regulatory programs designed to reduce GHG emissions from particular activities, especially in regards to the goals of AB 32.

## ENVIRONMENTAL IMPACTS

### Impact 4.7-1: Project-generated GHG emissions

The level of annual GHG emissions associated with the proposed project, including amortized construction-related emissions, would be approximately 10,193 MT CO<sub>2</sub>e/year. Both construction and operation of the proposed project would include GHG efficiency measures consistent with all State and local polices and regulations for the purpose of reducing GHG emissions and enabling achievement of the statewide reduction targets of AB 32 (2006), SB 32 (2016), and AB 197 (2016). The proposed project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. Therefore, this impact would be **less than significant**.

GHG emissions associated with the proposed project would be generated during project construction and by operation of the facility after it is built. Estimated levels of construction- and operation-related GHG emissions are presented below, followed by a discussion of the project's consistency with applicable regulations and policies established to enable the achievement of mandated statewide GHG reduction goals.

#### Construction-Generated Greenhouse Gas Emissions

Project-related construction activities would result in the generation of GHG emissions. Heavy-duty off-road construction equipment, materials transport, and worker commute during construction of the project would result in exhaust emissions of GHGs. Modeling results are shown below in Table 4.7-1.

Year	Annual MT CO <sub>2</sub> e
2018	1,868
2019	2,037
2020	2,007
2021	118
<b>Total Construction GHG Emissions</b>	<b>6,030</b>
<b>Amortized over 25 Years</b>	<b>241</b>

Notes: Totals may not add due to rounding.  
CO<sub>2</sub>e = carbon dioxide equivalent, MT = metric tons  
<sup>1</sup> Emissions estimates do not account for the use of high-performance renewable diesel fuel or the use of higher Tier diesel engines. These measures would be implemented if feasible and would result in lower construction-generated GHG emissions than identified in this table.

Source: Modeled by Ascent Environmental, Inc. 2017

As shown in Table 4.7-1, project construction is estimated to generate a total of 6,030 MT CO<sub>2</sub>e over the duration of the construction period (2018-2021). Total construction emissions were amortized over a 25-year period, consistent with guidance from SMAQMD (SMAQMD 2016), resulting in annualized emissions of

241 MT CO<sub>2</sub>e. If the construction emissions were amortized over the anticipated 50- to 100-year project lifespan, the annualized construction emissions would be 60.3 MT CO<sub>2</sub>e. The project may use high-performance renewable diesel as well as higher EPA diesel engine Tier levels (i.e., newer, more efficient engines with lower emission levels) for construction equipment. These measures were not accounted for in the construction GHG emissions estimates, as the extent of implementation of these measures remains unknown. Thus, the estimated level of construction-related GHG emissions is a conservative estimation and would be less if these measures were implemented.

### **Operational Greenhouse Gas Emissions**

Operation of the project would result in mobile-source GHG emissions associated with vehicle trips to and from the project (i.e., project-generated VMT); area-source emissions from the combustion of natural gas for space and water heating and operation of landscape maintenance equipment; energy-source emissions from the consumption of electricity; stationary-source emissions from the use of an emergency diesel backup generator; water-source emissions from water use and the conveyance and treatment of wastewater; and waste-source emissions from the transport and disposal of solid waste. Emissions generated from project operation are reported in Table 4.7-2.

These operational emissions include VMT from employees assumed to re-occupy the Resources Building after some future renovation. The re-occupation of the Resources Building would result in a net increase in State employees in the downtown area compared to existing conditions. The transfer of existing employees from the Resources Building to the new building at the P Street Block would not change the total number of employees in the downtown area. The new building is anticipated to accommodate up to approximately 1,200 additional office employees. The VMT and associated GHG emissions from this increase in employees in the downtown area is attributed to the Resources Building Replacement project. Then, the eventual re-occupation of the Resources Building would bring approximately 2,300 net new employees to the downtown area. The VMT and associated GHG emissions from these employees is added to the mobile-source GHG emissions identified in Table 4.7-2. However, the estimate of operational GHG emissions do not include emissions from the renovated Resources Building itself. The currently-occupied Resources Building is generating GHG emissions as part of existing building operation. Renovation of the Resources Building would allow it to operate in a more energy- and GHG-efficient manner. A renovated Resources Building would result in lower building operation emissions than under existing conditions. Rather than “taking credit” for future reduced GHG emissions at the Resources Building, the analysis takes a conservative approach and assumes there would be no change in GHG emissions for the Resources Building from existing conditions; and therefore, no net gain or decline in GHG emissions to incorporate into the emission calculations.

**Table 4.7-2 Operational Greenhouse Gas Emissions**

Source	MT CO <sub>2</sub> e (MT/year)
Area	<1
Energy	3,157
Mobile <sup>1</sup>	5,875
Stationary	424
Waste	223
Water	273
Amortized Construction Emissions	241
<b>Total Operational GHG Emissions</b>	<b>10,193</b>

Notes: Totals may not add due to rounding.

CO<sub>2</sub>e = carbon dioxide equivalent, MT = metric tons

<sup>1</sup> Includes VMT from approximately 1,200 new office employees occupying the new building at P Street Block and approximately 2,300 employees re-occupying a renovated Resources Building.

Source: Modeled by Ascent Environmental, Inc. 2017

Thus, the level of annual GHG emissions associated with the proposed project, including amortized construction-related emissions, is conservatively estimated to be approximately 10,193 MT CO<sub>2</sub>e/year.

### **Consistency with Applicable Plans, Policies, and Regulations for the Purpose of Reducing Greenhouse Gas Emissions**

#### **Consistency with the 2017 Scoping Plan Update**

Although the 2017 Scoping Plan Update has not been approved by CARB at the time of writing this environmental document, it is the most up-to-date material available supporting the statewide compliance with emissions levels identified in SB 32 and AB 197 of 2016. Consistency with the emissions targets provided by SB 32 and AB 197 would also result in consistency with emissions targets provided by AB 32 of 2006, which are less stringent. The proposed 2017 Scoping Plan Update lays out the framework for achieving the 2030 statewide GHG reduction target of 40 percent below 1990 levels. The update includes an appendix that details local actions that land use development projects and municipalities can implement to support the statewide goal. For project-level CEQA analyses, the proposed 2017 Scoping Plan states that projects should implement feasible mitigation, preferably measures that can be implemented on-site. Many of the project features align with these actions and would consist of on-site GHG reduction measures.

Construction of the project would include a recycling program for both construction and demolition waste, a measure that is detailed in Appendix B of the proposed 2017 Scoping Plan Update. The project may use high-performance renewable diesel fuel and higher EPA diesel Tier engines in construction equipment. The project would achieve or exceed LEED version 4 (v4) Silver certification (version 4 is the current version of the certification standards), which reduces building energy and water consumption, resulting in a decrease in GHG emissions. Further, the project would be built to achieve zero net energy requirements, which includes the installation of an on-site PV array that would generate renewable electricity for use by the project. During periods when the solar panels do not provide sufficient energy to support building operations (e.g., nighttime hours and cloudy days), energy would be provided by SMUD through a contract with the State requiring that energy provided to State buildings by SMUD be from 100 percent renewable sources. Other energy-efficient design features include energy-efficient interior lighting (i.e., light-emitting diodes [LED]), energy-efficient exterior lighting, and Energy Star™-certified computer monitors and office equipment. Refer to Section 3, "Project Description," for all project design features. The project would also maintain a street tree canopy surrounding the project, which helps to cool the building and decreases energy consumption and GHG emissions. If any of the existing shade trees on the project site need to be removed for construction, or there is a gap in the canopy, deciduous trees would be planted to replace them at the end of the construction phase.

The project would also feature transportation-related emissions reduction measures that are listed as local actions in the proposed 2017 Scoping Plan Update. These measures include bicycle parking for employees, access to light-rail and bus stops, limited onsite parking (i.e., 50 parking spaces for a building with capacity for approximately 3,500-employees), and electric vehicle charging stations. Lockers and showers would be available to employees to support bicycle commuting. The project would include water efficiency measures, which would decrease indirect GHG emissions associated with the treatment and distribution of potable water. These measures, which are also highlighted as local actions in the proposed 2017 Scoping Plan Update, include low-flow energy-efficient plumbing fixtures that exceed 2016 Title 24 water efficiency standards.

#### **Consistency with Executive Order B-18-12**

EO B-18-12 requires State agencies to implement green building practices to improve energy, water, and materials efficiency. The Executive Order applies to both renovated and new State buildings with a floor area greater than 10,000 square feet and specifies that buildings must use clean, on-site power generation. The project, which would include approximately 750,000 gross square feet of general purpose office space, plus additional square footage for amenities such as the childcare facilities, food court, retail space, an auditorium, and building operations space. Therefore, the proposed project is subject to this Executive Order and would implement all of these green building practices. The project would align with this Executive Order through achieving or exceeding LEED v4 Silver, becoming a ZNE facility, providing on-site solar panels, and providing electric vehicle charging stations.

### Consistency with the California Integrated Waste Management Act

The project would achieve a waste diversion rate of at least 50 percent, which is required for all State agencies, thereby meeting the requirements of the California Integrated Waste Management Act and reducing the level of GHGs associated with solid waste.

### Consistency with Greenhouse Gas Policies in the City of Sacramento 2035 General Plan and Climate Action Plan

The City of Sacramento 2035 General Plan includes a policy that aims to reduce GHG emissions through “discouraging auto-dependent sprawl and dependence on the private automobile; promoting water conservation and recycling; promoting development that is compact, mixed use, pedestrian friendly, and transit oriented; promoting energy-efficient building design and site planning; improving the job/housing ratio in each community; and other methods of reducing emissions” (City of Sacramento 2015). The Sacramento Climate Action Plan, which is incorporated into the City’s General Plan, include strategies to address GHG emissions associated with transportation and land use, energy, water, waste management and recycling, agriculture, and open space. The project aligns with these plans because of its downtown location on an underutilized block (preventing sprawl), the compact design (up to 300 feet tall on a roughly  $\frac{3}{4}$  city block), mixed-use elements (i.e., includes publicly-accessible food service and retail); the inclusion of human-scale outdoor spaces supporting pedestrian use outside the building, and its proximity to multiple modes of public transit, including light rail and bus lines. The project would feature energy-efficient design through its achievement of ZNE, meeting or exceeding LEED V4 Silver standards, and exceeding 2016 Title 24 building energy efficiency standards. The project would also exceed 2016 Title 24 water efficiency standards and use low-flow plumbing fixtures. As is required by State agencies, a waste diversion rate of at least a 50 percent would be achieved.

### Summary

The level of annual GHG emissions associated with the proposed project, including amortized construction-related emissions, is conservatively estimated to be approximately 10,183 MT CO<sub>2e</sub>/year, while supporting an employment center for up to approximately 3,500 employees and re-occupation of an existing building with approximately 2,300 additional buildings. Both construction and operation of the proposed new office building would include GHG efficiency measures consistent with all applicable State and local polices and regulations for reducing GHG emissions and enabling achievement of the statewide reduction targets of AB 32 (2006), SB 32 (2016), and AB 197 (2016). Thus, the proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. This impact would be **less than significant**.

### Mitigation Measures

No mitigation is required.

### Impact 4.7-2: Impacts of climate change on the project

Climate change is expected to result in a variety of effects that would influence conditions in the Sacramento area. However, the proposed project would include various features that would increase resiliency to the effects of climate change. These features would reduce the extent and severity of climate change-related impacts to the project. For these reasons, this impact would be **less than significant**.

Human-induced increases in GHG concentrations in the atmosphere have led to increased global average temperatures (climate change) through the intensification of the greenhouse effect, and associated changes in local, regional, and global average climatic conditions. Although there is strong scientific consensus that global climate change is occurring and is influenced by human activity, there is less certainty as to the timing, severity, and potential consequences of the climate phenomena. Scientists have identified several ways in which global climate change could alter the physical environment in California (CNRA 2012, California Department of Water Resources 2006, IPCC 2007). These include:

- ▲ increased average temperatures;
- ▲ modifications to the timing, amount, and form (rain vs. snow) of precipitation;

- ▲ changes in the timing and amount of runoff;
- ▲ reduced water supply;
- ▲ deterioration of water quality; and
- ▲ elevated sea level.

Many of these phenomena would translate into a variety of issues and concerns that may affect the project area, including but not limited to:

- ▲ increased frequency and intensity of extreme heat days;
- ▲ more intense variability in water supply, including more frequent or intense periods of drought;
- ▲ increased stormwater runoff associated with changes to precipitation patterns; and
- ▲ increased risk of flooding associated with changes to precipitation patterns.

The project would include features that enable adaptation and resiliency in the face of climate change-associated impacts. These features include:

- ▲ Rooftop solar panels that would provide a cool-roof effect, and tree canopy around the site, to protect the building and exterior walkways during extreme heat events;
- ▲ Water efficiency features, including low-flow plumbing fixtures and potentially the use of recycled water, sufficient to exceed the 2016 Title 24 water efficiency standards, reducing indoor potable water consumption by 40 percent from the LEED baseline, and reducing outdoor potable water consumption by 50 percent from the LEED baseline.
- ▲ Drainage features for handling storm water runoff during extreme storm events; and
- ▲ The location of the project results in it benefiting from improvements to the flood protection system intended to protect facilities and development in the entire downtown Sacramento area.

These design features would reduce the extent and severity of climate change-related impacts to the project. For these reasons, this impact would be **less than significant**.

## Mitigation Measures

No mitigation would be required.

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