

## 4.7 GREENHOUSE GAS EMISSIONS

This chapter describes the existing air quality setting and examines the greenhouse gas (GHG) emissions impacts associated with potential land uses changes associated with the San Joaquin River Parkway Master Plan Update (proposed Project). Because no single project is large enough to result in a measurable increase in global concentrations of GHG emissions, climate change impacts of a project are considered on a cumulative basis. This chapter is based on the methodology recommended by the San Joaquin Valley Air Pollution Control District (SJVAPCD).

### 4.7.1 ENVIRONMENTAL SETTING

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHG, to the atmosphere. The primary source of these GHG is fossil fuel use. The Intergovernmental Panel on Climate Change (IPCC) has identified four major GHG—water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and ozone (O<sub>3</sub>)—that are the likely cause of an increase in global average temperatures observed within the 20th and 21st centuries. Other GHG identified by the IPCC that contribute to global warming to a lesser extent include nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and chlorofluorocarbons (CFCs).<sup>1,2,3</sup> The major GHG are briefly described below.

- **Carbon dioxide (CO<sub>2</sub>)** enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and respiration, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH<sub>4</sub>)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in municipal landfills and water treatment facilities.
- **Nitrous oxide (N<sub>2</sub>O)** is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

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<sup>1</sup> Intergovernmental Panel on Climate Change (IPCC), 2001. Third Assessment Report: Climate Change 2001, New York: Cambridge University Press.

<sup>2</sup> Water vapor (H<sub>2</sub>O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant.

<sup>3</sup> Black carbon contributes to climate change both directly, by absorbing sunlight, and indirectly, by depositing on snow (making it melt faster) and by interacting with clouds and affecting cloud formation. Black carbon is the most strongly light-absorbing component of particulate matter (PM) emitted from burning fuels such as coal, diesel, and biomass. Reducing black carbon emissions globally can have immediate economic, climate, and public health benefits. California has been an international leader in reducing emissions of black carbon, with close to 95 percent control expected by 2020 due to existing programs that target reducing PM from diesel engines and burning activities (California Air Resources Board, 2013, October. Climate Change Scoping Plan First Update, [http://www.arb.ca.gov/cc/scopingplan/2013\\_update/discussion\\_draft.pdf](http://www.arb.ca.gov/cc/scopingplan/2013_update/discussion_draft.pdf)).

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- **Fluorinated gases** are synthetic, strong GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as high global-warming-potential (GWP) gases.
- **Chlorofluorocarbons (CFCs)** are GHGs covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants. Since they are not destroyed in the lower atmosphere (troposphere, stratosphere), CFCs drift into the upper atmosphere where, given suitable conditions, they break down ozone. These gases are also ozone-depleting gases and are therefore being replaced by other compounds that are GHGs covered under the Kyoto Protocol.
- **Perfluorocarbons (PFCs)** are a group of human-made chemicals composed of carbon and fluorine only. These chemicals (predominantly perfluoromethane [CF<sub>4</sub>] and perfluoroethane [C<sub>2</sub>F<sub>6</sub>]) were introduced as alternatives, along with HFCs, to the ozone-depleting substances. In addition, PFCs are emitted as by-products of industrial processes and are used in manufacturing. PFCs do not harm the stratospheric ozone layer, but they have a high global warming potential.
- **Sulfur Hexafluoride (SF<sub>6</sub>)** is a colorless gas soluble in alcohol and ether, slightly soluble in water. SF<sub>6</sub> is a strong GHG used primarily in electrical transmission and distribution systems as an insulator.
- **Hydrochlorofluorocarbons (HCFCs)** contain hydrogen, fluorine, chlorine, and carbon atoms. Although ozone-depleting substances, they are less potent at destroying stratospheric ozone than CFCs. They have been introduced as temporary replacements for CFCs and are also GHGs.
- **Hydrofluorocarbons (HFCs)** contain only hydrogen, fluorine, and carbon atoms. They were introduced as alternatives to ozone-depleting substances to serve many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are also used in manufacturing. They do not significantly deplete the stratospheric ozone layer, but they are strong GHGs.<sup>4, 5</sup>

Table 4.7-1 lists the GHG applicable to the proposed Project and their GWPs compared to CO<sub>2</sub>.

### California's Greenhouse Gas Sources and Relative Contribution

California is the second largest emitter of GHG in the United States, surpassed only by Texas, and the tenth largest GHG emitter in the world.<sup>6</sup> However, California also has over 12 million more people than the state of Texas. Because of more stringent air emission regulations in 2001, California ranked fourth lowest in carbon emissions

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<sup>4</sup> Intergovernmental Panel on Climate Change (IPCC), 2001. Third Assessment Report: Climate Change 2001. New York: Cambridge University Press.

<sup>5</sup> United States Environmental Protection Agency (EPA), 2012. Greenhouse Gas Emissions. <http://www.epa.gov/climatechange/ghgemissions/gases.html>.

<sup>6</sup> California Energy Commission (CEC), 2005. Climate Change Emissions Estimates from Gerry Bemis and Jennifer Allen. In Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2002 Update. California Energy Commission Staff Paper CEC-600-2005-025. Sacramento, California, June

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**TABLE 4.7-1 GHG EMISSIONS AND THEIR RELATIVE GLOBAL WARMING POTENTIAL COMPARED TO CO<sub>2</sub>**

GHGs	Second Assessment Report Atmospheric Lifetime (Years)	Fourth Assessment Report Atmospheric Lifetime (Years)	Second Assessment Report Global Warming Potential Relative to CO <sub>2</sub> <sup>a</sup>	Fourth Assessment Report Global Warming Potential Relative to CO <sub>2</sub> <sup>a</sup>
Carbon Dioxide (CO <sub>2</sub> )	50 to 200	50 to 200	1	1
Methane <sup>b</sup> (CH <sub>4</sub> )	12 (±3)	12	21	25
Nitrous Oxide (N <sub>2</sub> O)	120	114	310	298
Hydrofluorocarbons:	—	—	—	—
HFC-23	264	270	11,700	14,800
HFC-32	5.6	4.9	650	675
HFC-125	32.6	29	2,800	3,500
HFC-134a	14.6	14	1,300	1,430
HFC-143a	48.3	52	3,800	4,470
HFC-152a	1.5	1.4	140	124
HFC-227ea	36.5	34.2	2,900	3,220
HFC-236fa	209	240	6,300	9,810
HFC-4310mee	17.1	15.9	1,300	1,030
Perfluoromethane: CF <sub>4</sub>	50,000	50,000	6,500	7,390
Perfluoroethane: C <sub>2</sub> F <sub>6</sub>	10,000	10,000	9,200	12,200
Perfluorobutane: C <sub>4</sub> F <sub>10</sub>	2,600	NA	7,000	8,860
Perfluoro-2-methylpentane: C <sub>6</sub> F <sub>14</sub>	3,200	NA	7,400	9,300
Sulfur Hexafluoride (SF <sub>6</sub> )	3,200	NA	23,900	22,800

Notes: The IPCC has published updated global warming potential (GWP) values in its Fifth Assessment Report (2013) that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO<sub>2</sub> (radiative forcing is the difference of energy from sunlight received by the earth and radiated back into space). However, GWP values identified in the Second Assessment Report are still used by SJVAPCD to maintain consistency in GHG emissions modeling. In addition, the 2008 Scoping Plan was based on the GWP values in the Second Assessment Report.

a. Based on 100-year time horizon of the GWP of the air pollutant relative to CO<sub>2</sub>.

b. The methane GWP includes direct effects and indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO<sub>2</sub> is not included.

Source: Intergovernmental Panel on Climate Change (IPCC), 2007, Fourth Assessment Report: Climate Change 2007. New York: Cambridge University Press.

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per capita and fifth lowest among states in CO<sub>2</sub> emissions from fossil fuel consumption per unit of Gross State Product (total economic output of goods and services).<sup>7</sup>

CARB's latest update to the statewide GHG emissions inventory was conducted in 2012 for year 2009 emissions.<sup>8</sup> In 2009, California produced 457 million metric tons (MMT) of CO<sub>2</sub>-equivalent (CO<sub>2</sub>e) GHG emissions. California's transportation sector is the single largest generator of GHG emissions, producing 37.9 percent of the state's total emissions. Electricity consumption is the second largest source at 22.7 percent. Industrial activities are California's third largest source of GHG emissions—17.8 percent of the state's total emissions. Other major sectors of GHG emissions are commercial and residential, recycling and waste, high global warming potential GHGs, agriculture, and forestry.<sup>9,10</sup>

In 2016, the statewide GHG emissions inventory was updated for 2000 to 2014 emissions using the GWPs in IPCC's Fourth Assessment Report. Based on these GWPs, California produced 442 MMTCO<sub>2</sub>e GHG emissions in 2014. California's transportation sector remains the single largest generator of GHG emissions, producing 36.1 percent of the state's total emissions. Industrial sector emissions made up 21.1 percent and electric power generation made up 20.0 percent of the state's emissions inventory. Other major sectors of GHG emissions include commercial and residential (8.7 percent), agriculture (8.2 percent), high global warming potential GHGs (3.9 percent), and recycling and waste (2.0 percent).<sup>11</sup>

### Human Influence on Climate Change

For approximately 1,000 years before the Industrial Revolution, the amount of GHG in the atmosphere remained relatively constant. During the 20th century, however, scientists observed a rapid change in the climate and climate change pollutants that is attributable to human activities. The amount of CO<sub>2</sub> has increased by more than 35 percent since preindustrial times and has increased at an average rate of 1.4 parts per million (ppm) per year since 1960, mainly due to combustion of fossil fuels and deforestation.<sup>12</sup> These recent changes in climate change pollutants far exceed the extremes of the ice ages, and the global mean temperature is rising at a rate that cannot

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<sup>7</sup> California Energy Commission (CEC), 2006. Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004. Report CEC-600-2006-013-SF, December

<sup>8</sup> Methodology for determining the statewide GHG inventory is not the same as the methodology used to determine statewide GHG emissions under Assembly Bill 32 (AB 32) (2006).

<sup>9</sup> California Air Resources Board (CARB), 2012. California Greenhouse Gas Inventory for 2000–2009. By Category as Defined by the Scoping Plan, April.

<sup>10</sup> CO<sub>2</sub>-equivalence is used to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The global warming potential of a GHG is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

<sup>11</sup> California Air Resources Board (CARB), 2016. 2016 Edition California Greenhouse Gas Inventory for 2000-2014—by Category as Defined in the 2008 Scoping Plan. <http://www.arb.ca.gov/cc/inventory/data/data.htm>, June, accessed April 24, 2017.

<sup>12</sup> Intergovernmental Panel on Climate Change (IPCC), 2007. Fourth Assessment Report: Climate Change 2007. New York: Cambridge University Press.

be explained by natural causes alone. Human activities are directly altering the chemical composition of the atmosphere through the buildup of climate change pollutants.<sup>13</sup>

Climate-change scenarios are affected by varying degrees of uncertainty. IPCC's "2007 IPCC Fourth Assessment Report" projects that the global mean temperature increase from 1990 to 2100, under different climate change scenarios, will range from 1.4 to 5.8°C (2.5 to 10.4°F). In the past, gradual changes in the earth's temperature changed the distribution of species, availability of water, etc. However, human activities are accelerating this process so that environmental impacts associated with climate change no longer occur in a geologic time frame but within a human lifetime.<sup>14</sup>

## Potential Climate Change Impacts for California

Like the variability in the projections of the expected increase in global surface temperatures, the environmental consequences of gradual changes in the earth's temperature are also hard to predict. In California and western North America, observations of the climate have shown: 1) a trend toward warmer winter and spring temperatures, 2) a smaller fraction of precipitation falling as snow, 3) a decrease in the amount of spring snow accumulation in the lower and middle elevation mountain zones, 4) an advance snowmelt of 5 to 30 days earlier in the springs, and 5) a similar shift (5 to 30 days earlier) in the timing of spring flower blooms.<sup>15</sup> According to the California Climate Action Team, even if actions could be taken to immediately curtail climate change emissions, the potency of emissions that have already built up, their long atmospheric lifetimes (see Table 4.7-1), and the inertia of the Earth's climate system could produce as much as 0.6°C (1.1°F) of additional warming. Consequently, some impacts from climate change are now considered unavoidable. Global climate change risks to California are shown in Table 4.7-2 and include public health impacts, water resources impacts, agricultural impacts, coastal sea level impacts, forest and biological resource impacts, and energy impacts. Specific climate change impacts that could affect the project include health impacts from a deterioration in air quality, water resources impacts from a reduction in water supply, and increased energy demand.

### 4.7.1.1 REGULATORY SETTING

#### Federal Laws

The U.S. Environmental Protection Agency (EPA) announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people and that GHG emissions from on-road vehicles contribute to that threat. The EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHG

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<sup>13</sup> California Climate Action Team (CAT), 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature, March.

<sup>14</sup> Intergovernmental Panel on Climate Change (IPCC), 2007. Fourth Assessment Report: Climate Change 2007, New York: Cambridge University Press.

<sup>15</sup> California Climate Action Team (CAT), 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature, March.

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TABLE 4.7-2 SUMMARY OF GHG EMISSIONS RISKS TO CALIFORNIA

Impact Category	Potential Risk
Public Health Impacts	Poor air quality made worse More severe heat
Water Resources Impacts	Decreasing Sierra Nevada snow pack Challenges in securing adequate water supply Potential reduction in hydropower Loss of winter recreation
Agricultural Impacts	Increasing temperature Increasing threats from pests and pathogens Expanded ranges of agricultural weeds Declining productivity Irregular blooms and harvests
Coastal Sea Level Impacts	Accelerated sea level rise Increasing coastal floods Shrinking beaches Worsened impacts on infrastructure
Forest and Biological Resource Impacts	Increased risk and severity of wildfires Lengthening of the wildfire season Movement of forest areas Conversion of forest to grassland Declining forest productivity Increasing threats from pest and pathogens Shifting vegetation and species distribution Altered timing of migration and mating habits Loss of sensitive or slow-moving species
Energy Demand Impacts	Potential reduction in hydropower Increased energy demand

Sources: California Energy Commission (CEC), 2006, Our Changing Climate: Assessing the Risks to California. 2006 Biennial Report. California Climate Change Center. CEC-500-2006-077; California Energy Commission (CEC). 2008. The Future Is Now: An Update on Climate Change Science, Impacts, and Response Options for California. CEC-500-2008-0077.

emissions fit within the Clean Air Act definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements, but allow the EPA to finalize the GHG standards proposed in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation.<sup>16</sup>

<sup>16</sup> United States Environmental Protection Agency (EPA), 2009. EPA: Greenhouse Gases Threaten Public Health and the Environment. Science overwhelmingly shows greenhouse gas concentrations at unprecedented levels due to human activity. <http://yosemite.epa.gov/opa/admpress.nsf/0/08D11A451131BCA585257685005BF252>, December, accessed April 24, 2017.

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The EPA's endangerment finding covers emissions of six key GHGs—CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFC, PFC and SF<sub>6</sub>—that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world (the first three are applicable to the proposed Project).

In response to the endangerment finding, the EPA issued the Mandatory Reporting of GHG Rule that requires substantial emitters of GHG emissions (large stationary sources, etc.) to report GHG emissions data. Facilities that emit 25,000 metric tons (MT) or more of CO<sub>2</sub> per year are required to submit an annual report.

### State Laws

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in Executive Order S-03-05, Executive Order B-30-15, Assembly Bill 32 (AB 32), and Senate Bill 375 (SB 375).

#### *Executive Order S-03-05*

Executive Order S-3-05 was signed June 1, 2005, and set the following GHG reduction targets for the State:

- 2000 levels by 2010
- 1990 levels by 2020
- 80 percent below 1990 levels by 2050

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

Executive Order B-30-15, signed April 29, 2015, sets a goal of reducing GHG emissions within the state to 40 percent of 1990 levels by year 2030. Executive Order B-30-15 also directs CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the state and requires state agencies to implement measures to meet the interim 2030 goal as well as the long-term goal for 2050 in Executive Order S-03-05. It also requires the Natural Resources Agency to conduct triennial updates of the California adaption strategy, Safeguarding California, in order to ensure climate change is accounted for in state planning and investment decisions.

#### *Assembly Bill 32, The Global Warming Solutions Act (2006)*

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in AB 32, the Global Warming Solutions Act. AB 32 was passed by the California State Legislature on August 31, 2006, to place the state on a course toward reducing its contribution of GHG emissions. AB 32 follows the 2020 tier of emissions reduction targets established in Executive Order S-3-05.

AB 32 directed the California Resources Board (CARB) to adopt discrete early action measures to reduce GHG emissions and outline additional reduction measures to meet the 2020 target. Based on the GHG emissions inventory conducted for the Scoping Plan by CARB, GHG emissions in California by 2020 are anticipated to be approximately 596 MMTCO<sub>2e</sub>. In December 2007, CARB approved a 2020 emissions limit of 427 MMTCO<sub>2e</sub> (471 million tons) for the State. The 2020 target requires a total emissions reduction of 169 MMTCO<sub>2e</sub>, 28.5

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percent from the projected emissions of the business-as-usual (BAU) scenario for the year 2020 (i.e., 28.5 percent of 596 MMTCO<sub>2</sub>e).<sup>17,18</sup>

In order to effectively implement the emissions cap, AB 32 directed CARB to establish a mandatory reporting system to track and monitor GHG emissions levels for large stationary sources that generate more than 25,000 MT of CO<sub>2</sub> per year, to prepare a plan demonstrating how the 2020 deadline can be met, and to develop appropriate regulations and programs to implement the plan by 2012. The Climate Action Registry Reporting Online Tool was established through the Climate Action Registry to track GHG emissions.

### *CARB 2008 Scoping Plan*

The final Scoping Plan was adopted by CARB on December 11, 2008. Key elements of CARB's GHG reduction plan that may be applicable to the proposed Project include:

- Expanding and strengthening existing energy efficiency programs, as well as building and appliance standards (adopted and cycle updates in progress).
- Achieving a mix of 33 percent for energy generation from renewable sources (anticipated by 2020).
- A California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system for large stationary sources (adopted 2011).
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets (several Sustainable Communities Strategies have been adopted).
- Adopting and implementing measures pursuant to State laws and policies, including California's clean car standards (amendments to the Pavley Standards adopted 2009; Advanced Clean Car standard adopted 2012), goods movement measures, and the Low Carbon Fuel Standard (LCFS, adopted 2009).
- Creating target fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation (in progress).

Table 4.7-3 shows the proposed reductions from regulations and programs outlined in the 2008 Scoping Plan. Though local government operations were not accounted for in achieving the 2020 emissions reduction, CARB estimates that land use changes implemented by local governments that integrate jobs, housing, and services result in a reduction of 5 MMTCO<sub>2</sub>e, which is approximately 3 percent of the 2020 GHG emissions reduction goal. In recognition of the critical role that local governments play in the successful implementation of AB 32, CARB is recommending GHG reduction goals of 15 percent of today's levels by 2020 to ensure that municipal and

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<sup>17</sup> California Air Resources Board (CARB), 2008. Climate Change Scoping Plan, a Framework for Change.

<sup>18</sup> CARB defines BAU in its Scoping Plan as emissions levels that would occur if California continued to grow and add new GHG emissions but did not adopt any measures to reduce emissions. Projections for each emission-generating sector were compiled and used to estimate emissions for 2020 based on 2002–2004 emissions intensities. Under CARB's definition of BAU, new growth is assumed to have the same carbon intensities as was typical from 2002 through 2004.

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**TABLE 4.7-3 SCOPING PLAN GHG REDUCTION MEASURES AND REDUCTIONS TOWARD 2020 TARGET**

Recommended Reduction Measures	Reductions Counted toward 2020 Target of 169 MMT CO <sub>2</sub> e	Percentage of Statewide 2020 Target
<b>Cap and Trade Program and Associated Measures</b>		
California Light-Duty Vehicle GHG Standards	31.7	19%
Energy Efficiency	26.3	16%
Renewable Portfolio Standard (33 percent by 2020)	21.3	13%
Low Carbon Fuel Standard	15	9%
Regional Transportation-Related GHG Targets <sup>a</sup>	5	3%
Vehicle Efficiency Measures	4.5	3%
Goods Movement	3.7	2%
Million Solar Roofs	2.1	1%
Medium/Heavy Duty Vehicles	1.4	1%
High Speed Rail	1.0	1%
Industrial Measures	0.3	0%
Additional Reduction Necessary to Achieve Cap	34.4	20%
Total Cap and Trade Program Reductions	146.7	87%
<b>Uncapped Sources/Sectors Measures</b>		
High Global Warming Potential Gas Measures	20.2	12%
Sustainable Forests	5	3%
Industrial Measures (for sources not covered under cap and trade program)	1.1	1%
Recycling and Waste (landfill methane capture)	1	1%
Total Uncapped Sources/Sectors Reductions	27.3	16%
Total Reductions Counted toward 2020 Target	174	100%
<b>Other Recommended Measures– Not Counted toward 2020 Target</b>		
State Government Operations	1.0 to 2.0	1%
Local Government Operations <sup>b</sup>	To Be Determined	NA

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**TABLE 4.7-3 SCOPING PLAN GHG REDUCTION MEASURES AND REDUCTIONS TOWARD 2020 TARGET**

Recommended Reduction Measures	Reductions Counted toward 2020 Target of 169 MMT CO <sub>2</sub> e	Percentage of Statewide 2020 Target
Green Buildings	26	15%
Recycling and Waste	9	5%
Water Sector Measures	4.8	3%
Methane Capture at Large Dairies	1	1%
Total Other Recommended Measures – Not Counted toward 2020 Target	42.8	NA

Notes: The percentages in the right-hand column add up to more than 100 percent because the emissions reduction goal is 169 MMTCO<sub>2</sub>e and the Scoping Plan identifies 174 MTCO<sub>2</sub>e of emissions reductions strategies.

MMTCO<sub>2</sub>e: million metric tons of CO<sub>2</sub>e

a. Reductions represent an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target.

b. According to the Measure Documentation Supplement to the Scoping Plan, local government actions and targets are anticipated to reduce vehicle miles by approximately 2 percent through land use planning, resulting in a potential GHG reduction of 2 million metric tons of CO<sub>2</sub>e (or approximately 1.2 percent of the GHG reduction target). However, these reductions were not included in the Scoping Plan reductions to achieve the 2020 target.

Source: California Air Resources Board (CARB), 2008. Climate Change Scoping Plan, a Framework for Change.

community-wide emissions match the state’s reduction target.<sup>19</sup> Measures that local governments take to support shifts in land use patterns are anticipated to emphasize compact, low-impact growth over development in greenfields, resulting in fewer vehicle miles traveled (VMT).<sup>20</sup>

*First Update to the Scoping Plan*

CARB recently completed a five-year update to the 2008 Scoping Plan, as required by AB 32. The First Update to the Scoping Plan was adopted at the May 22, 2014, board hearing. The update defines CARB’s climate change priorities for the next five years and lays the groundwork to reach post-2020 goals in Executive Orders S-03-05 and B-16-2012. The update includes the latest scientific findings related to climate change and its impacts, including short-lived climate pollutants. The GHG target identified in the 2008 Scoping Plan is based on IPCC’s GWPs identified in the Second and Third Assessment Reports (see Table 4.7-1).<sup>21</sup> CARB projected that statewide BAU emissions in 2020 would be approximately 509 million MTCO<sub>2</sub>e.<sup>22</sup> Therefore, to achieve the AB 32 target of 431 million MTCO<sub>2</sub>e (i.e., 1990 emissions levels) by 2020, the state would need to reduce emissions by 78 million

<sup>19</sup> The Scoping Plan references a goal for local governments to reduce community GHG emissions by 15 percent from current (interpreted as 2008) levels by 2020, but it does not rely on local GHG reduction targets established by local governments to meet the state’s GHG reduction target of AB 32.

<sup>20</sup> California Air Resources Board (CARB), 2008. Climate Change Scoping Plan, a Framework for Change.

<sup>21</sup> IPCC’s Fourth and Fifth Assessment Reports identified more recent GWP values based on the latest available science. CARB recalculated the 1990 GHG emission levels with the updated GWPs in the Fourth Assessment Report, and the 427 MMTCO<sub>2</sub>e 1990 emissions level and 2020 GHG emissions limit, established in response to AB 32, is slightly higher at 431 MMTCO<sub>2</sub>e (CARB 2014).

<sup>22</sup> The BAU forecast includes GHG reductions from Pavley and the 33% Renewable Portfolio Standard.

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MTCO<sub>2e</sub> compared to BAU conditions, a reduction of 15.3 percent from BAU in 2020.<sup>23 24</sup> Therefore, to achieve the AB 32 target of 431 MMTCO<sub>2e</sub> (i.e., 1990 emissions levels) by 2020, the state would need to reduce emissions by 78 MMTCO<sub>2e</sub> compared to BAU conditions, a reduction of 15.3 percent from BAU in 2020.

The update highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals defined in the original 2008 Scoping Plan. As identified in the Update to the Scoping Plan, California is on track to meeting the goals of AB 32. However, the update also addresses the state's longer-term GHG goals within a post-2020 element. The post-2020 element provides a high level view of a long-term strategy for meeting the 2050 GHG goals, including a recommendation for the state to adopt a midterm target. According to the Update to the Scoping Plan, local government reduction targets should chart a reduction trajectory that is consistent with or exceeds the trajectory created by statewide goals.<sup>25</sup>

According to the Update to the Scoping Plan, reducing emissions to 80 percent below 1990 levels will require a fundamental shift to efficient, clean energy in every sector of the economy. Progressing toward California's 2050 climate targets will require significant acceleration of GHG reduction rates. Emissions from 2020 to 2050 will have to decline several times faster than the rate needed to reach the 2020 emissions limit.<sup>26</sup>

### *Second Update to the Scoping Plan*

The new Executive Order B-30-15 requires CARB to prepare another update to the Scoping Plan to address the 2030 target for the state. The second Scoping Plan will address the new 2030 interim target to achieve a 40 percent reduction below 1990 levels by 2030. CARB released *the 2030 Target Scoping Plan Update Concept Paper* in June 2016 that identifies potential scenarios focusing on different emissions sectors with and without the Cap-and-Trade program, which is currently in litigation.<sup>27</sup> Release of the second Scoping Plan Update that carries through the potential regulations and programs to achieve the 2040 target is anticipated in fall 2017.

### *Senate Bill 375*

In 2008, Senate Bill 375 (SB 375), the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reductions targets established in the Scoping Plan for the transportation sector to

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<sup>23</sup> California Air Resources Board (CARB), 2014. First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006, <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>, May 15, accessed April 24, 2017

<sup>24</sup> If the GHG emissions reductions from Pavley I and the Renewable Electricity Standard are accounted for as part of the BAU scenario (30 million MTCO<sub>2e</sub> total), then the state would need to reduce emissions by 108 million MTCO<sub>2e</sub>, which is a 20 percent reduction from BAU.

<sup>25</sup> California Air Resources Board (CARB), 2014. First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006, <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>, May 15, accessed April 24, 2017.

<sup>26</sup> California Air Resources Board (CARB), 2014. First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006, <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>, May 15, accessed April 24, 2017.

<sup>27</sup> California Air Resources Board (CARB), 2016. State of California, 2030 Target Scoping Plan Update Concept Paper, [http://www.arb.ca.gov/cc/scopingplan/document/2030\\_sp\\_concept\\_paper2016.pdf](http://www.arb.ca.gov/cc/scopingplan/document/2030_sp_concept_paper2016.pdf), June 17, accessed April 24, 2017.

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local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 17 regions in California managed by a metropolitan planning organization (MPO).

The Fresno Council of Governments (COG) is the MPO for the County of Fresno, and the Madera County Transportation Commission (CTC) is the MPO for the County of Madera. In September 2010, CARB set per capita GHG emissions reduction targets for 2020 and 2035 for the MPOs, except in the San Joaquin Valley region, where CARB identified a provisional target. This is because the eight MPOs in the San Joaquin Valley region are anticipated to absorb 22 percent of California's population growth. On December 14, 2012, CARB adopted a target recommendation for the eight MPOs in the San Joaquin Valley, which is a 5 percent per capita GHG reduction from 2005 in 2020 and a 10 percent per capita GHG reduction from 2005 in 2035 on an aggregate, valley-wide basis. Therefore, an individual target is not proposed for Fresno COG or Madera CTC.<sup>21</sup>

Fresno COG adopted the 2014 Regional Transportation Plan (RTP) Sustainable Communities Strategy (SCS) on June 26, 2014.<sup>28</sup> When implemented the SCS exceeds the passenger vehicle per capita GHG reduction targets of 5 percent by 2020 and 10 percent by 2035 from 2005 levels. Fresno COG's 2014 RTP/SCS alters historical growth patterns by focusing on inward growth paired with transit and active transportation investments, reducing the traditional development footprint. It encourages the cities and the county to focus on more compact infill development, more multi-family housing, and to place more emphasis on transit, bicycle and pedestrian infrastructure.<sup>29</sup>

### *Assembly Bill 1493*

California vehicle GHG emission standards were enacted under AB 1493 (Pavley I). Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and is anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. California implements the Pavley I standards through a waiver granted to California by the EPA. In 2012, the EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model year 2017 through 2025 light-duty vehicles (see also the discussion on the update to the Corporate Average Fuel Economy standards under Federal Laws, above). In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025, new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions..

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<sup>21</sup> California Air Resources Board (CARB), 2013. Staff Report Update on Senate Bill 375 Implementation in the San Joaquin Valley.

<sup>28</sup> Fresno Council of Governments (Fresno COG), 2014. 2014 Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS) <http://www.fresnocog.org/rtp>, June 26., accessed April 24, 2017.

<sup>29</sup> Fresno Council of Governments (Fresno COG), 2015. The Fresno Region's first Sustainable Communities Strategy to reduce greenhouse gases unanimously approved by ARB, [http://www.fresnocog.org/sites/default/files/publications/SCS/Press\\_Release-ARB\\_approves\\_Fresno\\_COGs\\_SCS\\_1\\_29\\_15.pdf](http://www.fresnocog.org/sites/default/files/publications/SCS/Press_Release-ARB_approves_Fresno_COGs_SCS_1_29_15.pdf), January 29, accessed April 24, 2017.

### *Executive Order S-01-07*

On January 18, 2007, the State set a new low carbon fuel standard (LCFS) for transportation fuels sold within the State. Executive Order S-1-07 sets a declining standard for GHG emissions measured in carbon dioxide equivalent gram per unit of fuel energy sold in California. The LCFS requires a reduction of 2.5 percent in the carbon intensity of California's transportation fuels by 2015 and a reduction of at least 10 percent by 2020. The standard applies to refiners, blenders, producers, and importers of transportation fuels and would use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods.

### *Executive Order B-16-2012*

On March 23, 2012, the State identified that CARB, the California Energy Commission (CEC), the Public Utilities Commission, and other relevant agencies worked with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to accommodate zero-emissions vehicles in major metropolitan areas, including infrastructure to support them (e.g., electric vehicle charging stations). The executive order also directs the number of zero-emission vehicles in California's state vehicle fleet to increase through the normal course of fleet replacement so that at least 10 percent of fleet purchases of light-duty vehicles are zero-emission by 2015 and at least 25 percent by 2020. The executive order also establishes a target for the transportation sector of reducing GHG emissions from the transportation sector 80 percent below 1990 levels.

### *Senate Bills 1078 and 107, and Executive Order S-14-08*

A major component of California's Renewable Energy Program is the renewable portfolio standard (RPS) established under Senate Bills 1078 (Sher) and 107 (Simitian). Under the RPS, certain retail sellers of electricity were required to increase the amount of renewable energy each year by at least 1 percent in order to reach at least 20 percent by December 30, 2010. Executive Order S-14-08 was signed in November 2008, which expands the state's renewable energy standard to 33 percent renewable power by 2020. This standard was adopted by the legislature in 2011 (SBX1-2). Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. The increase in renewable sources for electricity production will decrease indirect GHG emissions from development projects, because electricity production from renewable sources is generally considered carbon neutral.

### *Senate Bill 350*

Senate Bill 350 (de Leon), was signed into law September 2015 and establishes tiered increases to the RPS—40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also set a new goal to double the energy-efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

### *California Building Code: Building and Energy Efficiency Standards*

Energy conservation standards for new residential and non-residential buildings were adopted by the California Energy Resources Conservation and Development Commission (now the CEC) in June 1977 and most recently revised in 2013 (Title 24, Part 6, of the California Code of Regulations [CCR]). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for

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consideration and possible incorporation of new energy efficiency technologies and methods. On May 31, 2012, the CEC adopted the 2013 Building and Energy Efficiency Standards, which went into effect on July 1, 2014. Buildings that are constructed in accordance with the 2013 Building and Energy Efficiency Standards are 25 percent (residential) to 30 percent (nonresidential) more energy efficient than the 2008 standards as a result of better windows, insulation, lighting, ventilation systems, and other features.<sup>30</sup>

Most recently, the CEC adopted the 2016 Building and Energy Efficiency Standards. The 2016 Standards will continue to improve upon the current 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. These standards will go into effect on January 1, 2017. Under the 2016 Standards, residential buildings are 28 percent more energy efficient than the 2013 Standards, and nonresidential buildings are 5 percent more energy efficient than the 2013 Standards.

The 2016 standards will not achieve zero net energy. However, they do get very close to the state's goal and make important steps toward changing residential building practices in California. The 2019 standards will take the final step to achieve zero net energy for newly constructed residential buildings throughout California.<sup>31</sup>

### *California Building Code: CALGreen*

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11, Title 24, known as "CALGreen") was adopted as part of the California Building Standards Code (Title 24, CCR). CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.<sup>32</sup> The mandatory provisions of the California Green Building Code Standards became effective January 1, 2011.

### *2006 Appliance Efficiency Regulations*

The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608) were adopted by the CEC on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non-federally regulated appliances. Though these regulations are now often viewed as "business as usual," they exceed the standards imposed by all other states, and they reduce GHG emissions by reducing energy demand.

### *Solid Waste Regulations*

California's Integrated Waste Management Act of 1989 (AB 939, Public Resources Code §§ 40050 *et seq.*) set a requirement for cities and counties throughout the state to divert 50 percent of all solid waste from landfills by

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<sup>30</sup> California Energy Commission (CEC), 2015. 2016 Building Energy Efficiency Standards, Adoption Hearing Presentation. <http://www.energy.ca.gov/title24/2016standards/rulemaking/documents>, June 10, accessed April 24, 2017.

<sup>31</sup> California Energy Commission (CEC), 2015. 2016 Building Energy and Efficiency Standards Frequently Asked Questions. [http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016\\_Building\\_Energy\\_Efficiency\\_Standards\\_FAQ.pdf](http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf), accessed April 24, 2017.

<sup>32</sup> The green building standards became mandatory in the 2010 edition of the code.

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January 1, 2000, through source reduction, recycling, and composting. In 2008, the requirements were modified to reflect a per capita requirement rather than tonnage. To help achieve this, the act requires that each city and county prepare and submit a source reduction and recycling element. AB 939 also established the goal for all California counties to provide at least 15 years of ongoing landfill capacity.

AB 341 (Chapter 476, Statutes of 2011) increased the statewide goal for waste diversion to 75 percent by 2020 and requires recycling of waste from commercial and multifamily residential land uses.

The California Solid Waste Reuse and Recycling Access Act (AB 1327, California Public Resources Code Section 42900 *et seq.*) requires areas to be set aside for collecting and loading recyclable materials in development projects. The act required the California Integrated Waste Management Board to develop a model ordinance for adoption by any local agency requiring adequate areas for collection and loading of recyclable materials as part of development projects. Local agencies are required to adopt the model or an ordinance of their own.

Section 5.408 of the 2013 California Green Building Standards Code also requires that at least 50 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse.

In October of 2014 Governor Brown signed AB 1826 requiring businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses, including multifamily residential dwellings that consist of five or more units. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste.

### *Water Efficiency Regulations*

The 20x2020 Water Conservation Plan was issued by the Department of Water Resources (DWR) in 2010 pursuant to Senate Bill 7, which was adopted during the 7th Extraordinary Session of 2009–2010 and therefore dubbed “SBX7-7.” SBX7-7 mandated urban water conservation and authorized the DWR to prepare a plan implementing urban water conservation requirements (20x2020 Water Conservation Plan). In addition, it required agricultural water providers to prepare agricultural water management plans, measure water deliveries to customers, and implement other efficiency measures. SBX7-7 requires urban water providers to adopt a water conservation target of 20 percent reduction in urban per capita water use by 2020 compared to 2005 baseline use.

The Water Conservation in Landscaping Act of 2006 (AB 1881) requires local agencies to adopt the updated DWR model ordinance or equivalent. AB 1881 also requires the CEC to consult with the DWR to adopt, by regulation, performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

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### Parkway Master Plan Policies

The Conservancy will implement its mission and the Parkway Master Plan in a manner consistent with its adopted Parkway Master Plan goals, objectives, policies, design guidelines, and best management practices (BMPs) to the extent practicable.

#### 4.7.1.2 EXISTING SETTING

##### Existing Emissions

The existing Plan includes goals and supporting objectives and policies to preserve, protect and restore the natural resource values of the San Joaquin River corridor, and to provide public use of the river without adverse effects on those resources. Operation of park facilities along the approximately 22-mile reach, including campgrounds, interpretive centers, multi-purpose trails, fishing docks, non-motorized boat launch, and restroom facilities, generate existing GHG emissions from transportation sources (vehicles accessing park facilities), area sources (camp fires/barbeques), water use and wastewater generation, and solid waste disposal. In addition, there are currently 47 campsites within the San Joaquin River Parkway (40 river campsites and 7 campsites with hookups). Table 4.7-4 identifies existing GHG emissions.

**TABLE 4.7-4 EXISTING GHG EMISSIONS**

Activity	MTCO <sub>2</sub> e	% of Inventory
Campfires	212	4%
Area	<1	<1%
Energy	<1	<1%
Transportation	4,379	92%
Waste Disposal	154	3%
Water/Wastewater	41	1%
<b>Total</b>	<b>4,786</b>	<b>100%</b>

Notes: Modeling for park facilities is based on CalEEMod defaults.

Campsites are based on 2 bundles of wood burned per fire pit per campsite and conservatively assumes an average annual occupancy rate of 50 percent. GHG emissions from campfires are biogenic emissions.

Construction emissions for Lost Lake Park are amortized in the GHG inventory based on a 30-year lifetime.

Source: CalEEMod 2013.2.2. and EPA 42 (campsites).

## 4.7.2 STANDARDS OF SIGNIFICANCE

Per Appendix G of the CEQA Guidelines, climate change impacts associated with the proposed Project would be considered significant if the project would:

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

### 4.7.2.1 SJVAPCD SIGNIFICANCE CRITERIA

The issue of global climate change is, by definition, a cumulative environmental impact. The SJVAPCD adopted guidance methodology for addressing GHG emissions under CEQA on December 17, 2009.<sup>33</sup> In addition, SJVAPCD adopted a Climate Change Action Plan (CCAP) to identify strategies to reduce GHG emissions in the San Joaquin Valley Air Basin.<sup>34</sup> SJVAPCD's methodology includes a tiered approach:

- If a project is exempt from California Environmental Quality Act (CEQA), individual-level and cumulative GHG emissions are treated as less than significant.
- If the project complies with a GHG emissions reduction plan or mitigation programs that avoid or substantially reduce GHG emissions in the geographic area (i.e., city or county) in which the project is located, individual-level and cumulative GHG emissions are treated as less than significant.

### Performance Metric – Newhall Ranch Case Court Ruling

SJVAPCD's methodology for evaluating GHG emissions impacts also included methodology to evaluate whether or not a project would comply with AB 32 by conducting an analysis of whether the project would reduce GHG emissions by 29 percent from business as usual (BAU) through implementation of Best Performance Standards. The November 30, 2015, *Center for Biological Diversity v. California Department of Fish and Wildlife* (Newhall Ranch) ruling effectively limits use of this performance metric. The 29 percent below BAU established in the CARB Scoping Plan is derived from the statewide reduction target set by AB 32 for year 2020. The court held that the 29 percent is the statewide goal, but there is no substantial evidence that establishes a nexus between the statewide goal and the percent reduction a specific land use project would need to achieve to be consistent with the goals of AB 32. Projects must determine the reduction target specific to the land use type being proposed. Because SJVAPCD's significance criteria does not establish a nexus that connects the statewide GHG emissions reductions identified in the Scoping Plan to reductions needed for new development projects, an alternative approach to use

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<sup>33</sup> San Joaquin Valley Air Pollution Control District (SJVAPCD), 2009. Guidance for Valley Land-Use Agencies in Addressing GHG Emissions for New Projects, December 17.

<sup>34</sup> San Joaquin Valley Air Pollution Control District (SJVAPCD), 2009. Climate Change Action Plan, Final Staff Report, Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act, December 17.

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of the performance metric is being used by the District until SJVAPCD revises their Guidance Methodology to address the Newhall Ranch ruling.

### Bright-Line and Efficiency GHG Emissions Significance Thresholds

SJVAPCD has not formally provided guidance on how to analyze GHG emissions impacts for projects that are within their district. Until SJVAPCD provides formal guidance, the following alternative metrics used by air districts in California to assess GHG emissions impacts:

#### *Bright-Line Threshold*

The bright-line significance threshold is a numeric, mass emissions threshold. In general, the bright-line threshold identifies the point at which additional analysis of project-related GHG emissions impacts is necessary. Projects below the established bright-line significance criteria have a *de minimus* contribution to the local, regional, and/or statewide GHG emissions inventory and have less than significant impacts. Projects above this threshold may result in a substantial increase in GHG emissions.

The bright-line threshold is based on the methodology identified in the 2008 California Air Pollution Control Officers Association (CAPCOA) white paper.<sup>35</sup> It is based on the market capture approach and reflects the amount of emissions that 90 percent of development projects surveyed in four cities within California would generate. CAPCOA identified that a bright-line threshold set at 900 MTCO<sub>2e</sub> would capture 90 percent of projects. In general, 900 MTCO<sub>2e</sub>/yr corresponds to (1) a residential development of 50 dwelling units; (2) 35,000 square feet of office space; (3) 11,000 square feet of retail space; and (4) 6,300 square feet of supermarket space.<sup>36</sup>

The 900 MTCO<sub>2e</sub>/yr is used as it is the most conservative bright-line threshold. Exceeding the bright-line significance criteria does not necessarily indicate that the project generates a significant unavoidable impact. Consistent with how the bright-line threshold is applied in other air districts, the bright-line threshold is used as screening criteria to identify whether a full analysis of GHG emissions is warranted. If the project exceeds the screening threshold, the second level of analysis will compare the project to the efficiency metric discussed below.

#### *Efficiency Metric*

The efficiency metric identified by some air districts in California in the absence of a countywide GHG reduction plan is derived from CARB's Scoping Plan and is based on the projected year 2020 statewide emissions inventory for the land use sector and statewide population and employment, as follows:

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<sup>35</sup> California Air Pollution Control Officer's Association (CAPCOA), 2008. CEQA and Climate Change, January

<sup>36</sup> The Bay Area Air Quality Management District (BAAQMD) and South Coast Air Quality Management District (SCAQMD) have also established bright-line screening thresholds of 1,100 MTCO<sub>2e</sub> and 3,000 MTCO<sub>2e</sub> per year, respectively, for development projects based on similar market capture methodologies utilized by CAPCOA. SCAQMD based their bright-line screening threshold on review of 711 CEQA projects and determined that 90 percent of the projects reviewed would exceed 3,000 MTCO<sub>2e</sub> per year. SCAQMD, 2009. Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group, November 19. Similarly, the bright-line screening threshold established by BAAQMD captures approximately 59 percent of all development projects. BAAQMD, 2011 (revised May). California Environmental Quality Act Air Quality Guidelines.

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- 2020 Land Use Sector Emissions = 295,530,000 MTCO<sub>2</sub>e/yr)
- 2020 statewide employment for the land use sector = 17,064,489
- 2020 statewide population = 44,135,92337

Based on the inventory and statewide service population (SP) for the land use sector in 2020, the land use sector project efficiency threshold is estimated at 4.8 MTCO<sub>2</sub>e/yr/SP.

This efficiency metric represents the target per capita emission rate for land use development projects that would be consistent in meeting the AB 32 Year 2020 reduction target. However, the project buildout is anticipated to be beyond year 2020 in year 2026. To account for the additional GHG emissions reductions called for under Executive Order B-30-15, the efficient target is interpolated based on the efficient target for 2020 (i.e., 1990 levels by 2020) and 2030 (i.e., 40 percent below 1990 levels). If projects exceed this per capita efficiency target, GHG emissions would be considered potentially significant in the absence of mitigation measures. It should be noted that at this time, there is no statewide GHG reduction plan for post-2020 targets to achieve either the Executive Order B-30-15 or Executive Order S-03-05 long-term GHG goals; therefore, use of the 2026 target for the significance criteria is conservative.

### 4.7.3 IMPACT DISCUSSION

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts.

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<b>GHG-1</b>	<b>The proposed Project would generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.</b>
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Future development under the proposed Plan would result in improvements to existing park facilities and expansion of park facilities along an approximately 22-mile reach of the San Joaquin River. The majority of park facilities would be for passive uses that would not generate GHG emissions (e.g., multi-purpose trails, non-motorized boat launch, etc.). However, improvements and expansion of park facilities, including parking to accommodate increased visitors, would generate an increase in transportation sources of emissions. Likewise, other facilities such as a new interpretive center and restroom facilities would generate GHG emissions from energy use, water use and wastewater generation, and waste disposal. New campgrounds would also lead to an increase in area sources (e.g., campfires, barbecues). It should be noted that GHG emissions from campfires are considered biogenic and typically discounted since they are not anthropogenic. However, because campfires are a significant source of GHG emissions associated with the Project uses, they have been considered in this analysis. Construction of the proposed improvements would also generate a short-term increase in GHG emissions and are typically amortized over a 30-year project lifetime into the operational GHG emissions inventory to reflect the short-term nature of these emissions.

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<sup>37</sup> California Air Pollution Control Officer's Association (CAPCOA), 2008. CEQA and Climate Change, January.

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Of the facilities listed in Chapter 3, Project Description, the following locations would experience the most substantial changes due to the proposed Project. Improvements to other park facilities would be minor and would generate nominal short-term and long-term GHG emissions:

- **Lost Lake Park:** Improvements to the approximately 374-acre<sup>38</sup> Lost Lake Park in Fresno County are the most intensive of all the park improvements proposed as part of the Master Plan Update and include construction of a 500-square-foot entrance station, 1,530 additional day-use parking spaces plus 40 additional ADA-compliant parking spaces, a gravel parking lot for overflow (peak events) parking, fishing access and cleaning stations, three non-motorized boat access points, picnic tables including three uncovered group picnic areas with a large barbeques, 25 restroom facilities (800 square feet each), 40 riverside camping sites and 40 camping sites with hookups, 7,000 square feet for an indoor pavilion with commercial catering kitchen, 27 miles of parkway trails, 29 miles of nature trails, 5.9 miles of hiking/equestrian trails, and an interpretive/cultural center of up to 10,000 square feet.
- **River West-Madera.** The approximately 800-acre River West-Madera Project in Madera County includes improvements to both the Sycamore Island and Buren Unit facilities. The River West-Madera improvements include habitat restoration, 22 miles of multi-use trails, picnic areas, two parking areas with 60 parking stalls and 10 horse trailers, access roads, boat ramps (electric and non-motorized only), and a park host facility. A separate Initial Study/Mitigated Negative Declaration prepared in 2012 for these improvements found less than significant impacts with mitigation (SJVAPCD's construction fugitive dust control measures).
- **River Vista:** The approximately 177-acre River Vista in Madera County includes a hiking trail, hand-carried non-motorized boat launch, cultural interests, fishing, nature observation, parking, picnicking, and restrooms.

Due to the programmatic nature of this Environmental Impact Report (EIR) and funding requirements, the timing of specific improvements is speculative and construction information (construction schedules, etc.) is not known at this time. To estimate the potential magnitude of construction impacts, this program-level EIR evaluates impacts from construction of the improvements identified for the Lost Lake Park. Other park improvements would generate substantially less GHG emissions. Consequently, the magnitude of potential GHG emissions impacts for this program-level evaluation is estimated based on the improvements proposed for the Lost Lake Park. It should be noted that the Lost Lake Park project would undergo separate environmental review to identify project-specific impacts. Construction emissions are amortized over 30 years and included in the Project GHG emissions inventory.

Table 4.7-5 identifies GHG emissions associated with future development under the proposed Plan. Over 92 percent of the GHG emissions inventory is transportation emissions. Chapter 4.15, *Transportation and Traffic*, identifies that the proposed Project on full buildout would generate a net increase of 5,130 average daily vehicle trips as a result of an increase in 2,565 visitors. Table 4.3-8 identifies the potential increase in GHG emissions associated with an increased use of the Parkway with the associated improvements. As identified in the table, with GHG emissions reductions from State and Federal programs and regulations, operation of the Project would

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<sup>38</sup> The 374 acres includes additional Conservancy lands adjacent to Lost Lake Park, which includes 190 acres within the County of Fresno, 76 acres managed by the California Department of Fish and Wildlife and the Wildlife Conservation Board, and 108 acres adjacent Conservancy lands.

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**TABLE 4.7-5 PROJECT GHG EMISSIONS INVENTORY**

Activity	Existing MTCO <sub>2</sub> e/year	Proposed Project MTCO <sub>2</sub> e/year	Net Increase MTCO <sub>2</sub> e/year
Campfires <sup>a</sup>	212	540	329
Area	<1	<1	<1
Energy	<1	216	216
Transportation	4,379	15,453	11,074
Waste Disposal	154	251	97
Water/Wastewater	41	201	160
Lost Lake Amortized Construction <sup>b</sup>	0	52	52
<b>Total</b>	<b>4,786</b>	<b>16,714</b>	<b>11,928</b>
CAPCOA Screening Threshold	NA	NA	900 MTCO <sub>2</sub> e
Exceeds Screening Threshold	NA	NA	Yes
Annual Visitors <sup>c</sup>	830	3,395	2,565
Per Capita Emissions (MTCO <sub>2</sub> e/SP)	5.8 MT/SP	4.9 MTCO <sub>2</sub> e/SP	NA
2020 Per Capita Significance Threshold	NA	4.8 MTCO <sub>2</sub> e/SP	NA
Exceeds Per Capita Threshold	NA	Yes	NA

Notes: Modeling for park facilities is based on CalEEMod defaults. SP: service population.

a. Campsites are based on two bundles of wood burned per fire pit per campsite and conservatively assumes an average annual occupancy rate of 75 percent.

b. Construction emissions for Lost Lake Park are amortized in the GHG inventory based on a 30-year lifetime.

c. Based on planned parking lot spaces allocated and average daily visitor trips. Assumes 830 existing park users and a total of 3,395 projected park users, for a net increase of 2,565 park users.

Source: CalEEMod 2013.2.2. and EPA 42.

generate a total of 16,714 MTCO<sub>2</sub>e/Year. This represents an increase of 11,875 MTCO<sub>2</sub>e above existing conditions, mainly associated with an increase in vehicle trips.

As shown in Table 4.7-5, the proposed Project would generate 21,570 MTCO<sub>2</sub>e and would generate a substantial increase in GHG emissions and would exceed the per capita efficiency metric for year 2020 based on the anticipated park users. SJVAPCD's list of Best Performance Standards (BPS) were reviewed as potential measures to reduce the proposed Project's GHG emissions impacts. However, the current list of BPS only includes measures for residential, commercial, and mixed-use projects. The proposed Project is a Master Plan Update for the San Joaquin River Parkway facilities, which doesn't fit into these categories; therefore, the majority of these BPS are not directly applicable. Applicable BPS include:

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- *Energy Star roof:* Energy Star qualified roof products reflect more of the sun's rays, decreasing the amount of heat transferred into a building. Because the Scoping Plan includes emissions reductions from energy efficiency increases that have now been adopted in the California Building Code (e.g., the current Building and Energy Efficiency Standards), these reductions are accounted for in Table 4.7-5.
- *Onsite renewable energy system:* This reduction is not a current Project Design Feature and is therefore not accounted for in Table 4.7-5.
- *Exceed Title 24:* Project exceeds Title 24 requirements by 20 percent. SJVAPCD includes a BPS for projects that exceed Title 24 requirements by 20 percent based on the 2005 Building and Energy Standards. Because the Scoping Plan includes emissions reductions from energy efficiency increases that have now been adopted in the California Building Code (e.g., the current Building and Energy Efficiency Standards), these reductions are accounted for in Table 4.7-5.
- *Non-roof surfaces:* Provide shade (within 5 years) and/or use light-colored/high-albedo materials (reflectance of at least 0.3) and/or open grid pavement for at least 30 percent of the site's non-roof impervious surfaces, including parking lots, walkways, plazas, etc.; OR place a minimum of 50 percent of parking spaces underground or covered by structured parking; OR use an open-grid pavement system (less than 50 percent impervious) for a minimum of 50 percent of the parking lot area. Unshaded parking lot areas, driveways, fire lanes, and other paved areas have a minimum albedo of 0.3 or greater.<sup>39</sup> This reduction is not a current Project Design Feature and is therefore not accounted for in Table 4.7-5.

The proposed Plan also contains the following goal, policies and BMP, that would serve to reduce greenhouse gas emissions from the proposed Project:

### Air Resources, Climate Change Adaptation, and Sequestration

#### Goal:

- Incorporate climate adaptation and sequestration strategies in Parkway projects.

#### Policies:

- AIR.1          Restore habitat and conserve natural areas to contribute toward carbon sequestration.
- AIR.2          Promote cooperative reforestation projects to maximize carbon sequestration.
- AIR.5          Work with community and regional interests as a positive contributor to conservation of habitat and natural resources, and partner in the reduction of GHG emissions.
- AIR.6          Work to minimize the GHG footprint, energy and water use of Parkway operations, Conservancy and grant projects.

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<sup>39</sup> San Joaquin Valley Air Pollution Control District (SJVAPCD), 2009. Guidance for Valley Land-Use Agencies in Addressing GHG Emissions for New Projects, December 17.

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- AIR.7 Participate in and implement state and regional strategies to address climate change.
- AIR.8 Explore and support intergovernmental mitigation and sequestration partnerships.
- AIR.9 Develop and incorporate climate change goals and evaluation criteria in Parkway projects and grants, elevating priorities for components such as sequestration and habitat and trail linkages.
- AIR.10 Strive to connect primary multi-use trails to increase pedestrian and bicycle travel, reduce residents' reliance on motorized vehicles, and allow for longer, contiguous sections of the Parkway trail.

### **BMP GHG-1. Air Quality**

- Encourage contractors to use alternative fueled construction equipment, minimize idling time, and require that equipment is properly tuned.

As identified above, the proposed Project would exceed the GHG significance criteria and GHG emissions impacts of the Project's operation would be *significant*.

### **Applicable Laws, Regulations, and Permits, Relevant Local Land Use Policies:**

- CARB Airborne Toxics Control Measure (CCR 2840)
- Building Energy Efficiency Standards (Title 24)
- Appliance Energy Efficiency Standards (Title 20)
- Motor Vehicle Standards (AB 1493)
- SJVAPCD Regulation II – Permits
- SJVAPCD Regulation IV, Prohibitions, Rule 4100 – New Source Review Performance Standards
- SJVAPCD Regulation IV, Prohibitions, Rule 4101 – Visible Emissions
- SJVAPCD Regulation IV, Prohibitions, Rule 4102 – Nuisance
- SJVAPCD Regulation VIII – Fugitive PM10 Prohibitions
- SJVAPCD Regulation IX, Mobile and Indirect Sources, Rule 9410, Employer Based Trip Reduction.

**Significance Without Mitigation:** Significant.

**Impact GHG-1:** The Project would result in a substantial increase in GHG emissions and would not achieve a 29 percent reduction from BAU.

Mitigation Measures identified for Impact AQ-3 would also lessen impacts associated with an increase in GHG emissions. The following additional measures have been identified to reduce Project-related GHG emissions:

**Mitigation Measure GHG-1:** New structures shall be constructed with photovoltaic solar panels to offset building energy use, unless it can be demonstrated that such systems are not technologically feasible based on the location of structures, shading, or other site constraints.

**Significance With Mitigation:** Mitigation measures incorporated into future projects within the San Joaquin River Parkway for operation and construction phases described in Impact AQ-3 would reduce GHG

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emissions to the extent feasible. However, due to the programmatic nature of the proposed Project, no additional mitigation measures are available that would reduce impacts associated with GHG emissions to less than significant levels. While feasible mitigation measures would be imposed, due to the nature and scope of the Project along with its anticipated buildout horizon, regional construction and operational phase GHG emissions may not achieve the significance threshold. It should be noted that the identification of this program-level impact does not preclude the finding of less-than-significant impact for subsequent projects that comply with the applicable thresholds of significance. However, due to the programmatic nature of the proposed Project, no additional mitigation measures are available, and project-level and cumulative GHG impacts are considered *significant and unavoidable*.

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<b>GHG-2</b>	<b>The proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the GHG emissions.</b>
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Applicable plans adopted for the purpose of reducing GHG emissions include CARB's Scoping Plan and Fresno COG's Sustainable Community Strategies (SCS).

In accordance with AB 32, CARB developed the 2008 Scoping Plan to outline the State's strategy to achieve 1990-level emissions by year 2020. The CARB Scoping Plan is applicable to state agencies but is not directly applicable to cities/counties and individual projects. However, new regulations adopted by the state agencies outlined in the Scoping Plan result in GHG emissions reductions at the local level. As a result, local jurisdictions benefit from reductions in transportation emissions rates, increases in water efficiency in the building and landscape codes, and other statewide actions that would affect a local jurisdictions' emissions inventory from the top down. Statewide strategies to reduce GHG emissions include the Low Carbon Fuel Standard, California Appliance Energy Efficiency regulations, California Building Standards (i.e., CALGreen and the 2008 Building and Energy Efficiency Standards), California Renewable Energy Portfolio standard (33 percent RPS), changes in the corporate average fuel economy standards (e.g., Pavley I and Pavley II), and other measures that would ensure the state is on target to achieve the GHG emissions reduction goals of AB 32. Statewide GHG emissions reduction measures that are being implemented over the next six years would reduce the project's GHG emissions. According to the 2013 update to the Scoping Plan, the State is on track to achieving the 2020 targets of AB 32.<sup>40</sup>

New structures constructed within the Parkway Plan Area would be significantly more energy efficient as a result of improvements to the California Building Code. Likewise, new plumbing fixtures and landscaping would result in a decrease in water use on a per capita basis. Future development under the proposed Plan would not conflict with statewide programs adopted for the purpose of reducing GHG emissions.

The Fresno COG 2014–2040 RTP/SCS is a regional growth management strategy that targets per capita GHG reduction from passenger vehicles and light duty trucks in the Fresno COG region. The 2014–2040 RTP/SCS incorporates local land use projections and circulation networks from the local general plans. The projected regional development pattern—including location of land uses and residential densities in local general plans—

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<sup>40</sup> California Air Resources Board (CARB), 2013, Climate Change Scoping Plan First Update, [http://www.arb.ca.gov/cc/scopingplan/2013\\_update/discussion\\_draft.pdf](http://www.arb.ca.gov/cc/scopingplan/2013_update/discussion_draft.pdf), October, accessed April 24, 2017.

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when integrated with the proposed regional transportation network in the 2014–2040 RTP/SCS, would reduce per capita vehicular travel-related GHG emissions and achieve the regional GHG reduction per capita targets for the Fresno COG region. The per capita targets for the region are 5 percent below the 2005 baseline by year 2020 and 10 percent by year 2035. The 2014–2040 RTP/SCS identifies that the Fresno COG region will meet its per capita targets for both 2020 and 2035 at 9 percent and 11 percent, respectively. The proposed Project would provide recreational and conservation amenities that would serve the local population, which would not conflict with the land use and transportation strategies of the SCS. Further, the proposed Project would provide for regional interconnected pedestrian and bicycle transportation in lieu of vehicle use. Therefore, the proposed project would not conflict with the 2014-2040 RTP/SCS. Future development under the proposed Plan would not conflict with Fresno COG’s RTP/SCS adopted for the purpose of reducing GHG emissions. In addition, the proposed Plan includes a goal, several policies, and a BMP, listed above, that address greenhouse gas emissions. Impacts would be *less than significant*.

**Applicable Laws, Regulations, and Permits, Relevant Local Land Use Policies:**

- CARB Airborne Toxics Control Measure (CCR 2840)
- Building Energy Efficiency Standards (Title 24)
- Appliance Energy Efficiency Standards (Title 20)
- Motor Vehicle Standards (AB 1493)
- SJVAPCD Regulation II – Permits
- SJVAPCD Regulation IV, Prohibitions, Rule 4100 – New Source Review Performance Standards
- SJVAPCD Regulation IV, Prohibitions, Rule 4101 – Visible Emissions
- SJVAPCD Regulation IV, Prohibitions, Rule 4102 – Nuisance
- SJVAPCD Regulation VIII – Fugitive PM<sub>10</sub> Prohibitions
- SJVAPCD Regulation IX, Mobile and Indirect Sources, Rule 9410, Employer Based Trip Reduction.
- SJVAPCD Regulation IX, Mobile and Indirect Sources, Rule 9510 Indirect Source Review (ISR)

**Significance Without Mitigation:** Less than significant.

**4.7.4 CUMULATIVE IMPACTS**

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**GHG-3**                      **The Plan, in combination with past, present, and reasonably foreseeable projects, would cumulatively contribute to GHG emissions impacts.**

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This section analyzes potential impacts related to GHG emissions that could occur from the implementation of the proposed Project in combination with the regional growth within the air basin. Pursuant to the SJVAPCD’s guidance, GHG emissions impacts of a project are the project’s contribution to cumulative GHG emissions impacts in California. As identified above, GHG emissions would not achieve the GHG significance threshold, and as a result, impacts from the Project would be *significant*.

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### Applicable Laws, Regulations, and Permits, Relevant Local Land Use Policies:

- CARB Airborne Toxics Control Measure (CCR 2840)
- Building Energy Efficiency Standards (Title 24)
- Appliance Energy Efficiency Standards (Title 20)
- Motor Vehicle Standards (AB 1493)
- SJVAPCD Regulation II – Permits
- SJVAPCD Regulation IV, Prohibitions, Rule 4100 – New Source Review Performance Standards
- SJVAPCD Regulation IV, Prohibitions, Rule 4101 – Visible Emissions
- SJVAPCD Regulation IV, Prohibitions, Rule 4102 – Nuisance
- SJVAPCD Regulation VIII – Fugitive PM<sub>10</sub> Prohibitions
- SJVAPCD Regulation IX, Mobile and Indirect Sources, Rule 9410, Employer Based Trip Reduction.
- SJVAPCD Regulation IX, Mobile and Indirect Sources, Rule 9510 Indirect Source Review (ISR)

**Significance Without Mitigation:** Significant.

**Impact GHG-3:** The Project would result in a substantial increase in cumulatively considerable GHG emissions and would not achieve a 29 percent reduction from BAU. Mitigation Measures identified for Impact AQ-3 would also lessen impacts associated with an increase in GHG emissions. The additional measures identified in Mitigation Measure GHG-1 would reduce Project-related GHG emissions.

**Mitigation Measure GHG-3:** Implement Mitigation Measure GHG-1.

**Significance With Mitigation:** Mitigation measures incorporated into future projects within the San Joaquin River Parkway for operation and construction phases described in Impact AQ-3 would reduce GHG emissions to the extent feasible. However, due to the programmatic nature of the proposed Project, no additional mitigation measures are available that would reduce impacts associated with GHG emissions to less than significant levels. While feasible mitigation measures would be imposed, due to the nature and scope of the Project along with its anticipated buildout horizon, regional construction and operational phase GHG emissions may not achieve the significance threshold. It should be noted that the identification of this program-level impact does not preclude the finding of less-than-significant impact for subsequent projects that comply with the applicable thresholds of significance. However, due to the programmatic nature of the proposed Project, no additional mitigation measures are available, and project-level and cumulative GHG impacts are considered *significant and unavoidable*.