

## 3.5 Global Climate Change

### 3.5.1 Introduction

This section presents the regulatory setting, environmental setting, and potential impacts of the Proposed Project as related to climate change.

Data sources used in the preparation of this section include state and federal regulations and reference materials from the Bay Area Air Quality Management District (BAAQMD). Concepts and terminology that are in Section 3.2, *Air Quality* also are applicable in this section. This discussion analyzes air quality impacts over the entire duration of the existing SMP and proposed SMP Update.

### 3.5.2 Regulatory Setting

#### ***Federal Plans, Policies, Regulations, and Laws***

Climate change and GHG reduction also are a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change.

#### ***State Plans, Policies, Regulations, and Laws***

##### *Assembly Bill 1493*

In 2002, Assembly Bill 1493 (AB 1493) launched an innovative and pro-active approach to dealing with greenhouse gas (GHG) emissions and climate change at the state level. AB 1493 requires that the California Air Resources Board (CARB) develop and implement regulations to reduce automobile and light truck GHG emissions; these regulations apply to automobiles and light trucks beginning with the 2009 model year.

##### *Executive Orders S-3-05 and S-20-06/Global Warming Solutions Act—Assembly Bill 32*

AB 1493 cited several potential risks that California faces from climate change, including reduction in the state's water supply, increased air pollution created by higher temperatures, harm to agriculture, increase in wildfires, floods, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices.

On June 1, 2005, former Governor Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: (1) 2000 levels by 2010; (2) 1990 levels by 2020; and (3) 80 percent below the 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of AB 32, the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals as the Governor's Executive Order, while further mandating that CARB create a plan (including market mechanisms), and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action

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Team. No later than January 1, 2012, CARB must adopt rules and regulations to implement GHG emissions reductions.

### *Senate Bill 97 and CEQA*

In 2007, Senate Bill 97 (SB 97) was adopted to provide greater certainty to lead agencies that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. Pursuant to SB 97, the California Natural Resources Agency adopted amendments to the State CEQA Guidelines to address analysis and mitigation of the potential effects of GHG emissions in CEQA documents and processes. These amendments became effective on March 18, 2010. Topics of the amendments include but are not limited to (California Natural Resources Agency 2010):

- requiring a lead agency to make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of greenhouse gas emissions resulting from a project;
- requiring a lead agency to consider the project's effect on GHG emissions in comparison to the existing setting, an exceedance of a significance threshold by the project, and the extent to which the project complies with adopted regulations or requirements among others, when assessing the significance of impacts from greenhouse gas emissions on the environment;
- identifying types of suitable/applicable mitigation measures for GHG emissions; and
- allowing project-specific environmental documents to tier from and/or incorporate by reference any existing programmatic review of GHG emissions, such as in a general plan, a long range development plan, or a separate plan to reduce GHG emissions.

### *Actions Taken by California Attorney General's Office*

The California Attorney General (AG) has filed comment letters under CEQA about a number of proposed projects. The AG also has filed several complaints and obtained settlement agreements for CEQA documents covering general plans and individual programs that the AG found either failed to analyze GHG emissions or failed to provide adequate GHG mitigation. The AG's office has prepared a report that lists measures that local agencies must consider under CEQA to offset or reduce global warming impacts. Information on the AG's actions can be found on the State of California Department of Justice, Office of the Attorney General's Web site (California Department of Justice 2008).

### ***Regional and Local Plans, Policies, Regulations, and Ordinances***

CARB has designated 15 air basins in the state. Thirty-five local air quality management districts are responsible for attainment and permitting in each basin and subbasin area. Santa Clara County is located in the San Francisco Bay Area Air Basin. The BAAQMD oversees planning and permitting in the nine-county Bay Area, including Santa Clara County.

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### *Bay Area 2010 Clean Air Plan*

The BAAQMD adopted a new clean air plan, the Bay Area 2010 Clean Air Plan, in September 2010. The purposes of the plan are to: provide a control strategy to reduce greenhouse gases in a single, integrated plan; review progress in improving air quality in recent years; and establish emission control measures to be adopted or implemented in the 2010–2012 timeframe (BAAQMD 2011).

### *BAAQMD CEQA Air Quality Guidelines/ Significance Thresholds*

The BAAQMD published CEQA guidelines to aid assessment of air quality impacts in 2011 (BAAQMD 2011). The guidelines address evaluating air quality impacts and their significance, and developing mitigation measures for significant impacts. The guidelines focus on criteria air pollutant, GHG, toxic air contaminant, and odor emissions generated from plans or projects. Table 3.5-1 provides the guidelines-recommended significance criteria for analysis of project-related GHG impacts. Based on discussions with the BAAQMD, the BAAQMD's operational CEQA significance thresholds are most appropriate for the Proposed Project (Michael, pers. comm., 2010).

**Table 3.5-1.** Applicable BAAQMD CEQA Thresholds of Significance for Greenhouse Gases

Pollutant	Operational Significance Thresholds
GHGs—projects other than stationary sources	a) Compliance with qualified GHG reduction strategy <b>OR</b> b) 1,100 metric tons (MT) of carbon dioxide equivalent (CO <sub>2</sub> e) per year <b>OR</b> c) 4.6 MT CO <sub>2</sub> e/service population (residents and employees) per year

Source: BAAQMD 2011

### 3.5.3 Environmental Setting

This section discusses greenhouse gases and anticipated climate change conditions in the Project Area.

#### ***Greenhouse Gases and Climate Change***

Anthropogenic emissions of greenhouse gases are widely accepted in the scientific community as contributing to global warming. According to *Climate Change 2007: The Physical Science Basis: Summary for Policymakers* (Intergovernmental Panel on Climate Change [IPCC] 2007), there is no doubt that the climate system is warming. Global average air and ocean temperatures, as well as global average sea level, are rising. The period from 1995 through 2006 ranked as among the warmest on record since 1850. Although some of the increase is explained by natural occurrences, the 2007 report asserts that the increase in temperature is very likely (greater than 90 percent) caused by human activity, most notably the burning of fossil fuels.

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For California, similar effects are described in *Our Changing Climate: Assessing the Risks to California* (California Climate Change Center 2006). Based on projections using state of the art climate modeling, temperatures in California are expected to rise between 3°F and 10.5°F (1.7°C and 5.8°C) by the end of the century, depending on how much California and the rest of the globe are able to reduce their GHG emissions. The report states that these temperature increases will negatively impact public health, water supply, agriculture, plant and animal species, and the coastline.

Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors) and toxic air contaminants, which are pollutants of regional and local concern. Worldwide, California is the 12th to 16th largest emitter of CO<sub>2</sub> (California Energy Commission 2006), and is responsible for approximately 2 percent of the world's CO<sub>2</sub> emissions (California Energy Commission 2006).

The IPCC was commissioned by the World Meteorological Organization and United Nations Environment Program to assess scientific, technical, and socio-economic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC predicts that substantial increases in temperatures globally may affect the natural environment in California in the following ways:

- rising sea levels along the California coastline, particularly in San Francisco and the San Joaquin Delta caused by ocean expansion;
- extreme-heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent;
- an increase in heat-related human deaths, infectious diseases, and a higher risk of respiratory problems caused by deteriorating air quality;
- reduced snow pack and stream flow in the Sierra Nevada, affecting winter recreation and water supplies;
- potential increase in the severity of winter storms, affecting peak stream flows and flooding;
- changes in growing season conditions that may affect California agriculture, causing variations in crop quality and yield; and/or
- changes in distribution of plant and wildlife species because of changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems are occurring at a time when California's population is expected to increase from 34 million to 59 million by 2040 (California Energy Commission 2006). Therefore, the number of people potentially affected by climate change as well as the amount of anthropogenic GHG emissions anticipated under a "business as usual" scenario is expected to increase. Similar changes as those noted above for California also are expected occur in other parts of the world, with regional variations in resources affected and vulnerability to adverse effects.

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GHG emissions in California are attributable to human activities associated with industrial/manufacturing, utilities, transportation, residential, and agricultural sectors (California Energy Commission 2006) as well as natural processes. Transportation is responsible for 41 percent of the state's GHG emissions, followed by the industrial sector (23 percent), electricity generation (20 percent), agriculture and forestry (8 percent) and other sources (8 percent) (California Energy Commission 2006). Emissions of CO<sub>2</sub> and N<sub>2</sub>O are byproducts of fossil fuel combustion, among other sources. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills, among other sources. Sinks of CO<sub>2</sub> include uptake by vegetation and dissolution into the ocean.

### 3.5.4 Impact Analysis

#### ***Methodology***

Although SMP Update activities would be countywide, transitory, and short term, similar to construction activities, they would serve the purpose of maintaining existing features rather than constructing new features. Therefore, as discussed above, the BAAQMD has indicated that emissions resulting from SMP Update activities would be considered to be operational emissions for the purposes of estimating air quality impacts. Air emissions from SMP Update activities were estimated for three sources: off-road vehicles, on-road vehicles, and pesticide use. Off-road vehicle emissions were estimated using equipment data and CARB's OFFROAD 2007 model. On-road vehicle emissions were estimated using vehicle miles traveled (see Section 3.12, *Traffic and Transportation*) and CARB's EMFAC 2007 model. The GHG emissions from pesticide use under the Proposed Project would be extremely small in the context of the overall Proposed Project emissions. Therefore, they were not included in the emissions calculations and are not anticipated to result in any material change in the magnitude of the impact.

The BAAQMD CEQA Guidelines provide the thresholds of significance for GHG emissions based on carbon dioxide equivalents (CO<sub>2</sub>e), which consists of emissions of carbon dioxide, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and hydrofluorocarbons (HFC). The EMFAC 2007 and OFFROAD 2007 models estimate only carbon dioxide (CO<sub>2</sub>) emissions. The U.S. Environmental Protection Agency estimates that, on average, CH<sub>4</sub>, N<sub>2</sub>O, and HFC constitute 5 percent of GHG emissions from automobiles and CO<sub>2</sub> constitutes the remaining 95 percent (USEPA 2010). Using this assumption, CO<sub>2</sub>e emissions were estimated based on modeled CO<sub>2</sub> emissions.

#### ***Criteria for Determining Significance***

For the purposes of this analysis, the Proposed Project would result in a significant impact on global climate change if it would:

- A. generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- B. conflict with an applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

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Note that emissions associated with the Proposed Project were estimated for the various maintenance activities as a whole; for this reason, the impact discussion in this section is not broken down by the individual activities.

### **Environmental Impacts**

#### **Impact GCC-1: Temporary Increase in Greenhouse Gases during Maintenance Activities (Significance Criteria A, B; Less than Significant with Mitigation or Significant and Unavoidable)**

Use of vehicles and equipment for Proposed Project maintenance activities would require fossil fuel combustion that would generate GHG emissions.

This analysis considers emissions from both existing SMP activities (conducted pursuant to the 2002 SMP EIR) and additional emissions resulting from implementation of the Proposed Project (SMP update from 2012 to 2022). The existing SMP allows the majority of maintenance activities to be conducted between June 15 and October 15, although some activities occur year-round. The Proposed Project would extend the period when maintenance activities could be conducted (for those not occurring year-round), from October 15 to December 31.

Table 3.5-2 summarizes average daily CO<sub>2</sub>e operational emissions for 2012 and 2020. For additional information on how emissions were estimated refer to Appendix E. Daily CO<sub>2</sub>e emissions would decrease between 2012 and 2020, primarily because the California Air Resources Board's Low Carbon Fuel Standard (LCFS) is expected to reduce CO<sub>2</sub>e emissions from vehicles by a total of 7.2 percent by 2020. CO<sub>2</sub>e emissions reductions from LCFS would occur through SCVWD's tiered vehicle replacement program.

**Table 3.5-2. 2012 and 2020 Average Daily CO<sub>2</sub>e Emissions**

<b>Emissions Source</b>	<b>2012 Estimate (pounds per day)</b>	<b>2020 Estimate pounds per day</b>
Off-Road	48,565.7	41,824.0
On-Road	16,042.9	15,041.0
Pesticide Use	-	-
<i>Total</i>	<i>64,608.6</i>	<i>56,865.0</i>
<b>BAAQMD Threshold</b>	<b>None</b>	

Note: Daily vehicle trips and vehicle miles traveled would remain the same in the SMP Update as in the existing SMP.

Source: Data compiled by Horizon Water and Environment in 2011

Table 3.5-3 shows the Proposed Project's estimated annual CO<sub>2</sub>e emissions. For additional information on how emissions were estimated refer to Appendix E. Annual emissions from the SMP Update would increase because of the extended work window, during which an additional 25 percent of work is estimated to be completed. This increase would be offset somewhat by a 7.2 percent emissions decrease, associated with the LCFS.

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**Table 3.5-3. 2012 and 2020 Annual CO<sub>2</sub>e Emissions**

<b>Emissions Source</b>	<b>2012 Estimate (metric tons per year)</b>	<b>2020 Estimate (metric tons per year)</b>
<b>Existing SMP</b>		
Off-Road	1,873.0	1,613.0
On-Road	1,892.5	1,774.3
Pesticide Use	-	-
<i>Total</i>	<i>3,765.5</i>	<i>3,387.3</i>
<b>Additional Emissions under the SMP Update (2012-2022)</b>		
Off-Road	468.2	403.2
On-Road	129.4	126.7
Pesticide Use	-	-
<i>Total</i>	<i>597.7</i>	<i>529.9</i>
<b>Total SMP</b>		
Off-Road	2,341.2	2,016.2
On-Road	2,022.0	1,901.0
Pesticide Use	-	-
<i>Total</i>	<i>4,363.2</i>	<i>3,917.3</i>
<b>BAAQMD threshold</b>	<b>1,100</b>	

Source: Data compiled by Horizon Water and Environment in 2011

### *Applicable Best Management Practices*

The following BMPs would be implemented as part of the SMP Update, which would reduce GHG emissions during maintenance activities, although the exact extent cannot be quantified. Descriptions of each BMP are provided in Chapter 2, *Project Description*.

BMP GEN-4: Minimize the Area of Disturbance

BMP GEN-29: Dust Management

### *Conclusion*

Table 3.5-3 shows that annual emissions of GHGs from the SMP Update would be greater than BAAQMD operational significance thresholds. GHG emissions in exceedance of BAAQMD significance thresholds would be considered a potentially significant impact. The District would implement Mitigation Measure AIR-1A, which would reduce NO<sub>x</sub> emissions by 20 percent, and also may reduce other GHG emissions. Although possible, this measure is not expected to reduce GHG emissions below the threshold. Therefore, this impact would remain significant after this mitigation.

Therefore, the District would implement either Mitigation Measure GCC-1A or GCC-1B, or a combination of both measures, to offset annual GHG emissions in exceedance of BAAQMD significance thresholds. Implementation of either Mitigation Measure GCC-1A or GCC-1B, or a combination of both measures, would reduce this impact to a less-than-significant level. However, it is possible that these mitigation measures may not be feasible because of the factors discussed below. If the District found these mitigation measures to be infeasible, then this impact would be considered significant and unavoidable.

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### ***Mitigation Measures: GCC-1A On-site or Off-site GHG Emissions Mitigation Program***

In recent years, SCVWD has reduced its GHG emissions on several projects, including production of energy from SCVWD-owned renewable sources. As a result, SCVWD has GHG emissions credits that have not been previously applied as reductions/offsets for GHG emissions. SCVWD also may establish a new program to implement off-site GHG emissions reduction projects within the SFBAAB to obtain the new emissions credits. SCVWD will use existing or new emissions credits to reduce/offset GHG emissions from the SMP in exceedance of BAAQMD operational significance thresholds.

The total credits will be equal to the average emissions above the threshold over the lifetime of the SMP Update, or 30,402 metric tons (the average exceedance between the 2012 and 2020 estimated emissions, multiplied by 10 years), as adjusted based on the emissions reductions achieved by Mitigation Measure AIR-1A. The GHG emission reductions credits/projects will be from sources of emissions that are not required by any existing law to reduce their GHG emissions. Offsetting annual emissions inherently includes offsetting daily emissions. Therefore, no additional reductions/offsets will be required for daily GHG emissions. Documentation of any existing or new GHG reductions/offsets will be provided to the BAAQMD. In addition, any existing or new SCVWD GHG offset credits accounted for under this mitigation measure will be verified by the Climate Action Reserve so that the offsets are real, permanent, and verifiable.

This mitigation measure may not be feasible, based on costs, logistics, or other factors. Regarding logistics, whether the District could develop a new on-site or off-site mitigation program to effectively reduce emissions to less-than-significant levels in a timely manner is uncertain.

### ***Mitigation Measures: GCC-1B: GHG Emissions Offsets***

As an alternative to Mitigation Measure GCC-1A, or if SCVWD does not have sufficient GHG credits, SCVWD may purchase additional GHG emissions credits. The total credits will be equal to the average emissions above the threshold over the lifetime of the SMP Update, or 30,402 metric tons, as adjusted based on the emissions reductions achieved by Mitigation Measure AIR-1A.

For purchased credits, SCVWD will open a Climate Action reserve account or engage a private broker to facilitate the purchase of carbon offset credits from a voluntary market. Carbon offset credits purchased by SCVWD will be banked by the Climate Action Reserve, so that carbon offset credits purchased are real, permanent, and verifiable. Carbon offset credits will be measured in metric tons of CO<sub>2</sub>e. Documentation of existing and/or purchased GHG offsets will be provided to the BAAQMD.

This mitigation measure may not be feasible, based on costs or other factors.