5.5 Air Quality and Climate

5.5.1 Introduction

This section describes the climate and existing air quality for the study area and surrounding region, and evaluates whether the proposed desalination plant and related facilities would result in adverse effects to air quality and climate change. Specifically, this evaluation focuses on whether the proposed project would conflict with the implementation of the applicable air quality plan; violate any air quality standards or contribute to an air quality violation; result in a cumulative net increase of any criteria pollutant[1] for which the region is nonattainment[2]; expose sensitive receptors to substantial pollutant concentrations; or create objectionable odors.

The analysis also considers the current scientific understanding and relevant regulations related to global climate change, and evaluates whether the project would result in a considerable contribution to climate change effects. Specifically, the evaluation focuses on whether the project would: (1) generate greenhouse gas (GHG) emissions, either directly or indirectly, that may have a significant impact on the environment; or (2) conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

The description of the environmental setting and evaluation of impacts is based on data from the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (USEPA), and on anticipated project emissions obtained by applying emission models (i.e., EMFAC, OFFROAD) and emission factors (i.e., AP-42). **Appendix T, scwd² Regional Seawater Desalination Project EIR Air Quality and Climate Calculations**, provides details regarding these emissions estimates. **Appendix O, Summary of scwd² Energy and GHG Reduction Approach**, provides details regarding the GHG emissions of the proposed project, and the approach to reducing those emissions. Additional information in this section is derived from Section 5.5, Air Quality of the *Integrated Water Plan Program Environmental Impact Report* (IWP Program EIR) (City, 2005a), as well as from other references, as cited throughout this section[3].

Public and agency comments related to air quality and GHG were received during the public scoping period in response to the Notice of Preparation, and are summarized below:

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[1] Criteria air pollutants are those constituents for which national and state ambient air quality standards (AAQSs) have been established.

[2] Nonattainment areas are geographic regions that have been designated as not meeting one or more of the federal or state AAQSs.

[3] Referenced documents in this EIR are available for review at the City of Santa Cruz Water Department offices at 212 Locust Street, Suite D, Santa Cruz, California 95060, Monday through Thursday 8:00 a.m. to Noon and 1:00 p.m. to 5:00 p.m, except holidays. Likewise, these documents are available for review at the Soquel Creek Water District offices at 5180 Soquel Drive, Soquel, CA 95073, Monday through Friday 8:00 a.m. to Noon and 1:00 p.m. to 5:00 p.m, except holidays.

- Evaluate impacts on air quality and adjacent sensitive receptors during construction and operation of the proposed project.
- Evaluate potential odor impacts, including any odors associated with the pump station.
- Discuss GHG emissions that will result from the project, during both construction and operation, and identify mitigation measures and reduction strategies.
- Compare project-related GHG emissions to local, regional, and statewide GHG inventories.
- Examine the City of Santa Cruz Climate Action Plan (CAP) and its relationship to the project.
- Discuss project's relationship to Assembly Bill 23 (AB 32).

To the extent that issues identified in public comments involve potentially significant effects on the environment according to the California Environmental Quality Act (CEQA), and/or were raised by responsible and trustee agencies, they are identified and addressed in this EIR. For a complete list of public comments received during the public scoping period refer to **Appendix A, Scoping Report City of Santa Cruz and Soquel Creek Water District (scwd²) Regional Seawater Desalination Project**.

5.5.2 Environmental Setting

The topography and climate of the region affects how air pollutants are formed, dispersed, and trapped. The following subsections describe the regional setting and climate, and the project area setting that is relevant to the subsequent evaluation of air quality and climate impacts. The project area setting focuses on existing air quality related to criteria air pollutants and toxic air contaminants (TACs), and includes the identification of sensitive receptors near the project area. The project area setting also addresses global climate change and GHGs.

Regional Setting

The study area is in the North Central Coast Air Basin (NCCAB), which consists of Monterey, Santa Cruz, and San Benito counties. For those pollutants that could have local effects, such as pollutants associated with construction emissions, the study area for the proposed project includes the project area and immediately vicinity. For those pollutants that could have regional effects, the study area corresponds to the NCCAB. The NCCAB is centered on the Salinas Valley and covers an area of 5,159 square miles, inclusive of the Santa Cruz and Santa Lucia mountain ranges, and portions of the Diablo Range at the southern extent of the Santa Clara and San Benito valleys (MBUAPCD, 2008).

The climate in the NCCAB is dominated by the Pacific High, a semi-permanent high-pressure cell over the eastern North Pacific Ocean. In the summer, the Pacific High generates persistent westerly and northwesterly winds. Air aloft tends to descend and compress on the eastern side of

the Pacific High, forming a stable temperature inversion of warmer air over a cool, moist layer of air near the ocean surface. The warm, stable air aloft inhibits vertical air movement. Fog forms in the cooler maritime surface layer, and is carried by onshore winds into the coastal valleys. The generally northwest-southeast orientation of mountain ranges in the NCCAB tends to channel the summer onshore air currents into the interior portion of the Salinas and San Benito valleys, where surface heating causes air to rise and creates a weak low pressure, which intensifies the onshore air flow during the afternoon and evening.

In the fall, the on-shore surface winds become weak and the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement, which allows pollutants to build up near the surface over a period of a few days, while the Pacific High pressure cell remains relatively stationary. It is most often during this season that the northerly or easterly winds develop to transport pollutants from either the San Francisco Bay Area or the Central Valley into the NCCAB.

During the winter, the Pacific High migrates southward and has less influence on the NCCAB. Air frequently flows in a southeasterly direction out of the Salinas and San Benito valleys, especially during night and morning hours. Northwesterly winds are nevertheless still dominant in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the NCCAB as a whole in winter and early spring.

Ambient air quality is commonly characterized by climatological conditions, the meteorological influences on air quality, and the quantity and type of pollutants released. The coastal area of Santa Cruz County (County) is subject to a combination of topographical and climatic factors that reduce the potential for high levels of regional and local air pollutants. The region's climate is characterized by warm, dry summers and mild, rainy winters. High temperatures and low precipitation are prevalent from approximately April through August. November through March are dominated by cooler temperatures and heavy rains caused by low-pressure intrusion as high pressure retreats. Although winters are typically mild, winds originating from inland regions can lead to short-term periods of cold temperatures in the area.

Summaries of temperature and precipitation data from the climatological station in Santa Cruz, located at DeLaveaga Park, are presented in **Table 5.5-1, Average Monthly Temperature and Precipitation for Santa Cruz**.

Project Setting

The project area and surroundings are influenced by the prevailing wind from the northwest, with the highest wind speeds averaging 10 to 15 miles per hour. Average wind speeds for the City of Santa Cruz (City) are 5 to 6 miles per hour (City, 2005a). The persistent on-shore air circulation generally results in good air quality. Moreover, the project area is not downwind of major pollutant-generating centers. Existing air quality conditions are described in detail below. GHGs and factors influencing climate change are also described in this section.

Table 5.5-1. Average Monthly Temperature and Precipitation for Santa Cruz

Month	Average Maximum Temperature (degrees Fahrenheit)	Average Minimum Temperature (degrees Fahrenheit)	Average Total Precipitation (inches)
January	59.80	39.30	6.56
February	62.20	41.30	5.49
March	64.20	42.20	4.34
April	67.40	43.50	2.14
May	70.50	46.70	0.66
June	73.50	49.70	0.20
July	74.10	51.90	0.08
August	75.00	52.10	0.09
September	75.80	51.00	0.34
October	72.70	47.50	1.27
November	65.80	43.00	3.86
December	60.40	39.50	5.63
Annual	68.50	45.70	30.66

Source: Western Regional Climate Center, 2011. Climate Data for Santa Cruz, California (047916).
Period of Record: 07/01/1948 to 12/31/2005.

Existing Air Quality

Criteria Air Pollutants

Criteria air pollutants are those constituents for which national and state ambient air quality standards have been established. **Table 5.5-2, Ambient Air Quality Standards**, provides the national and state standards. The basis for these standards is described in **Section 5.5.3, Regulatory Framework**. The criteria air pollutants evaluated for the proposed project include sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), nitrogen dioxide (NO_2), and ozone (O_3), for which volatile organic compounds (VOCs) and nitrogen oxides (NO_x) are surrogates. Although lead is a criteria pollutant, it was not evaluated in this EIR because fuel containing lead would not be used during construction or operation of the proposed project.

Criteria air pollutant concentrations are measured at a number of monitoring stations throughout the NCCAB. The stations that are most representative of the existing air quality conditions near the project area are the Santa Cruz and Davenport monitoring stations, which are approximately 4 miles east-northeast and 8.5 miles west-northwest of the alternative plant sites, respectively. The Santa Cruz monitoring station is at 2544 Soquel Avenue in the City; and the Davenport monitoring station is at Marine View and Center Avenue in Davenport. The Santa Cruz monitoring station is the closest station to the project area, and it monitors O_3, PM_{10} and $PM_{2.5}$. The Davenport station measures CO, NO_2, and SO_2.

Table 5.5-2. Ambient Air Quality Standards

Contaminant	Averaging Time	State Standards[1]	Primary Federal Standards[2]	Secondary Federal Standards[2]
Ozone	1-hour	0.09 ppm	-	-
	8-hour	0.070 ppm	0.075 ppm	0.075 ppm
Particulate Matter (PM_{10})	24-hour	50 µg/m³	150 µg/m³	150 µg/m³
	Annual arithmetic mean	20 µg/m³	-	-
Particulate Matter ($PM_{2.5}$)	24-hour	-	35 µg/m³	35 µg/m³
	Annual arithmetic mean[4]	12 µg/m³	12.0 µg/m³	15.0 µg/m³
Carbon Monoxide	8-hour	9.0 ppm	9 ppm	-
	1-hour	20 ppm	35 ppm	-
Nitrogen Dioxide	Annual arithmetic mean	0.030 ppm	0.053 ppm	0.053 ppm
	1-hour	0.18 ppm	0.1 ppm	-
Sulfur Dioxide	Annual arithmetic mean[5]	-	0.03 ppm	
	24-hour[5]	0.04 ppm	0.14 ppm	-
	3-hour	-	-	0.5 ppm
	1-hour	0.25 ppm	75 ppb	-
Lead	30-day average	1.5 µg/m³	-	-
	Rolling 3 Month Average	-	0.15 µg/m³	0.15 µg/m³
Visibility reducing particles	8-hour	See footnote 3	-	-
Sulfates	24-hour	25 µg/m³	-	-
Hydrogen Sulfide	1-hour	0.03 ppm	-	-
Vinyl Chloride	24-hour	0.01 ppm	-	-

Sources: California Air Resources Board, 2012. Ambient Air Quality Standards Chart; United States Environmental Protection Agency, 2013. National Ambient Air Quality Standards.

Notes:

1. California standards for ozone, carbon monoxide, sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter – PM_{10}, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour, or 24-hour average, then some measurements may be excluded. In particular, measurements that the Air Resources Board determines would occur less than once per year on average are excluded.
2. National standards other than for ozone, particulates, and those based on annual averages are not to be exceeded more than once per year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than 1. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m³. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m³. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM_{10} is met if the 3-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the 3-year average of annual averages spatially averaged across officially designed clusters of sites falls below the standard.
3. Statewide visibility reducing particles Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent.
4. On December 14, 2012, USEPA promulgated a new $PM_{2.5}$ annual National Ambient Air Quality Standard (NAAQS) of 12 µg/m³.
5. Final rule signed June 2, 2010. The 1971 annual and 24-hour sulfur dioxide standards were revoked in that same rulemaking. However, these standards remain in effect until 1 year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

Acronyms:

ppm = parts per million by volume ppb = parts per billion by volume µg/m³ = micrograms per cubic meter - = no standard available.

Table 5.5-3, Air Quality Summary for the Study Area, summarizes the last 5 years of published data from these monitoring stations for O_3, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$. The NCCAB is non-attainment for the state ozone and PM_{10} standards, but is in attainment or unclassified for all other state and federal standards (MBUAPCD, 2013a). A description of each criteria pollutant is presented after the table.

Table 5.5-3. Air Quality Data Summary for the Study Area (2006-2010)

Pollutant		Standard		Monitoring Data, by Year					
Averaging Time	Units	Federal	State	2006	2007	2008	2009	2010	Station
Ozone (O_3)									
Highest 1-Hour Average	ppm	--	0.09	0.067	0.072	0.086	0.073	0.077	(1)
Highest 8-Hour Average	ppm	0.075	0.07	0.057	0.066	0.066	0.061	0.059	(1)
Particulate Matter (PM_{10})									
Highest 24-Hour Average	µg/m³	150	50	37	32	44	35	31	(1)
Annual Average	µg/m³	--	20	18	17	19	16	15	(1)
Particulate Matter ($PM_{2.5}$)									
Highest 24-Hour Average (98th percentile)	µg/m³	35	--	12.5	15.7	12.5	N/A	N/A	(1)
Annual Average	µg/m³	15	12	6.85	6.35	6.56	5.6	6.5	(1)
Carbon Monoxide (CO)									
Highest 8-Hour Average	ppm	9	9.0	0.8	1.0	1.3	5.24	0.64	(2)
Nitrogen Dioxide (NO_2)									
Highest 1-Hour Average	ppm	0.100	0.18	0.030	0.029	0.034	0.02	0.028	(2)
Sulfur Dioxide (SO_2)									
Highest 1-Hour Average	ppm	0.25	0.075	0.018	0.013	0.028	N/A	N/A	(2)

Sources: California Air Resources Board (CARB), 2011a. iADAM: Air Quality Data Statistics;
United States Environmental Protection Agency, 2011e. Greenhouse Gas Reporting Program.
Notes:
Station explanation: (1) 2544 Soquel Avenue, Santa Cruz; (2) Center Ave, Davenport.
Acronyms:
CO = carbon monoxide
NO_2 = nitrogen dioxide
O_3 = ozone
PM_{10} = particulate matter less than 10 microns in diameter
$PM_{2.5}$ – particulate matter less than 2.5 microns in diameter
SO_2 = sulfur dioxide
ppm = parts per million;
µg/m³ = micrograms per cubic meter;
N/A = not round (or readily available);
-- = standard does not exist.

Volatile organic compounds. VOCs are gaseous chemical compounds that contain the element carbon, with some exceptions. VOCs are composed of hydrocarbons that may contribute to the formation of smog. They are sometimes also referred to as non-methane organic compounds, or reactive organic gas.

Ozone. O_3, commonly referred to as smog, is formed in the atmosphere as a secondary pollutant rather than being directly emitted from pollutant sources. O_3 forms as a result of VOCs and NO_x reacting in the presence of sunlight in the atmosphere. VOCs and NO_x are termed "ozone precursors," and their emissions are regulated in order to control the creation of O_3. These precursors are emitted over a large area from a variety of sources; thus, O_3 impacts an entire region rather than a localized area. Because its formation is dependent on sunlight to drive the reaction, O_3 levels are highest in warm-weather months.

O_3 damages lung tissue and reduces lung function. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems (e.g., asthmatics), but also healthy children and adults. O_3 can cause health effects such as chest discomfort, coughing, nausea, respiratory tract and eye irritation, and decreased pulmonary functions.

Nitrogen dioxide. NO_2 is a poisonous, reddish-brown to dark-brown gas with an irritating odor. NO_2 forms when nitric oxide (NO) reacts with atmospheric oxygen. Most sources of NO_2 are manmade; the primary source of NO_2 is high-temperature combustion, such as in automobiles or power plants. NO_2 may produce adverse health effects such as nose and throat irritation, coughing, choking, headaches, nausea, stomach or chest pains, and lung inflammation (e.g., bronchitis, pneumonia).

Carbon monoxide. CO is an odorless, colorless gas that is toxic. It is formed by the incomplete combustion of fuels. The primary sources of this pollutant in the County are automobiles and other mobile vehicles. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Sulfur dioxide (SO_2). SO_2 is formed when fuel containing sulfur (typically, coal and oil) is burned, and during other industrial processes. High SO_2 concentrations are found in the vicinity of large industrial facilities, such as the cement plant in Davenport when it was operational. This type of industrial facility is not common in the project area. Low concentrations of SO_2 can also be found in the vicinity of diesel motor engines, which are common. The physical effects of high concentrations of SO_2 include temporary breathing impairment, respiratory illness, and aggravation of existing cardiovascular disease. Children and the elderly are most susceptible to the negative effects of exposure to SO_2.

Particulate Matter. PM consists of solid and liquid particles of dust, soot, aerosols, and other matter small enough to remain suspended in the air for a long period of time. PM_{10} refers to particulate matter with an aerodynamic diameter less than or equal to 10 micrometers; and $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers. Particulates smaller than 10 micrometers (both PM_{10} and $PM_{2.5}$) represent that portion of particulate matter thought to represent the greatest hazard to public health. PM_{10} and $PM_{2.5}$ can accumulate in the respiratory system and are associated with a variety of negative health effects. Exposure to particulates can aggravate existing respiratory conditions, increase respiratory

symptoms and disease, decrease long-term lung function, and possibly cause premature death. The segments of the population that are most sensitive to the negative effects of particulate matter in the air are the elderly, individuals with cardiopulmonary disease, and children. Aside from adverse health effects, particulate matter in the air can cause a reduction of visibility, and damage to building materials.

A portion of the particulate matter in the air comes from natural sources such as windblown dust and pollen. Manmade sources of particulate matter include fuel combustion, automobile exhaust, field burning, factories, and vehicle movement or other manmade disturbances of unpaved areas. Secondary formation of particulate matter may occur in some cases where gases such as sulfur and nitrogen oxides (SO_X and NO_X) interact with other compounds in the air to form particulate matter. Fugitive dust generated by construction activities is a source of suspended particulate matter.

Toxic Air Contaminants

Toxic air contaminants (TACs) are not considered criteria pollutants because the federal and California Clean Air Acts do not address them specifically through the setting of ambient air quality standards (see **Section 5.5.3** for additional information). However, TACs are regulated by the state and the Monterey Bay Unified Air Pollution Control District (MBUAPCD). The TACs relevant to the proposed project are described below

Diesel Particulate Matter. Diesel exhaust contains over 40 different substances identified by the CARB as TACs that may pose a threat to human health. The particulate matter in diesel exhaust has been identified as a TAC by CARB, and it has been linked to lung cancer.

Acrolein. Acute exposure to acrolein may cause irritation to the eyes, skin, and respiratory tract. Acrolein is a colorless or yellow liquid with a disagreeable odor. It comes from burning organic matter, including tobacco, gasoline, oil, trees, and plants.

Sensitive Receptors

Some locations or populations are considered to be particularly sensitive to adverse effects from air pollution, and these are commonly termed sensitive receptors. The MBUAPCD defines a sensitive receptor as any residence; education resources such as preschools and kindergarten through grade twelve (K-12) schools; daycare centers; health care facilities such as hospitals, hospices, retirement and nursing homes; and prisons.

Sensitive receptors in proximity to air pollution sources, TACs, or odors are of particular concern. The alternative desalination plant sites in Area A are on land designated for industrial land uses, and are surrounded primarily by commercial and industrial facilities. The nearest sensitive receptors to Area A, a residence and a daycare, are on Natural Bridges Drive, approximately 75 feet from the western edge of Plant Site A-1. These same uses would be further away from Plant Sites A-2 and A-3 and Intake Site SI-14. Residences are also adjacent to

the intake pump station locations for Intake Sites SI-4, SI-5, SI-7, SI-16, and SI-18. The Pacific Collegiate School, a Santa Cruz City Schools property, is also adjacent to the pump station location for Intake Site SI-16. The majority of the intake, brine, and water delivery pipelines would pass through residential areas, as well as commercial and industrial areas.

Climate Change and Greenhouse Gases

Climate Change

Climate change refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. Climate change may result from natural factors, natural processes, and human activities that change the composition of the atmosphere and alter the surface and features of the land. Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, attributed to accumulation of GHG emissions in the atmosphere (California Office of Planning and Research, 2008).

Since the late-19th century, global surface temperatures have increased about 0.74 degree Celsius (°C) (plus or minus 0.18°C).[4] For the past 50 years, temperatures have increased 0.13°C (plus or minus 0.03°C)[5] per decade, which is nearly twice that for the past 100 years. Seven of the eight warmest years on record have occurred since 2001, and the 10 warmest years have all occurred since 1995. A number of agencies around the world have produced datasets of global-scale changes in surface temperature using different techniques to process the data and remove measurement errors that could lead to false interpretations of temperature trends. The warming trend that is apparent in all of the independent methods of calculating global temperature change is also confirmed by other independent observations, such as the melting of mountain glaciers on every continent, reductions in the extent of snow cover, earlier blooming of plants in spring, a shorter ice season on lakes and rivers, ocean heat content, reduced arctic sea ice, and rising sea level (National Climatic Data Center, 2012).

Gases that trap heat in the atmosphere are often called GHGs. This layer of gases functions much the same as glass in a greenhouse (i.e., both prevent the escape of heat), which is why this phenomenon is known as the "greenhouse effect". The greenhouse effect helps to regulate the temperature of the Earth and is essential for life and other natural processes. The greenhouse effect is the result of heat absorption by GHGs, and re-radiation downward of some of that heat. The concern is not with the fact that we have a greenhouse effect, but whether human activities are leading to an enhancement of the greenhouse effect by the emission of GHGs through fossil-fuel combustion and deforestation. A large body of evidence, accumulated over several decades from hundreds of studies, supports the conclusion that human activity is the primary driver of recent warming (National Climatic Data Center, 2012).

[4] 0.74°C (plus or minus 0.18°C) is equivalent to 1.33°F (plus or minus 0.32°F).
[5] 0.13°C (plus or minus 0.03°C) is equivalent to 0.23°F (plus or minus 0.05°F).

With respect to California, climate change impacts include changes in temperature, precipitation patterns, availability of water, rise in sea level, and altered coastal conditions (CO-CAT, 2010). Over the past century, sea level along the California coast has risen as much as 7 inches, increasing erosion and straining the state's infrastructure, water supplies, and natural resources (CNRA, 2009). As a result of climate change, California has seen an increase in temperatures primarily occurring at night and during the winter (CDWR, 2009), shifts in the water cycle, longer growing seasons, and snowmelt and rainwater runoff occurring earlier than normal (CNRA, 2009). The snowpack in the Sierra Nevada has decreased by approximately 10 percent, a reduction of 1.5 million acre-feet of water in storage, in the last century as a result of climate change (CDWR, 2009).

Future climate change models project California's mean temperature rising 3.5 to 11 degrees Fahrenheit (°F) by the year 2100; the Sierra Nevada snowpack decreasing by 25 to 40 percent by 2050; and a possible global sea-level rise of 7 to 55 inches by the year 2100 (CDWR, 2009). Projections also suggest that substantial sea-level rise may occur even faster than historical rates[6] over the next century (CCCC, 2006). The Sea Level Rise Task Force of the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT) has developed interim guidelines for sea-level rise (CO-CAT, 2010). According to the guidelines, 16 inches in sea-level rise (above year 2000 levels) should be planned for by the year 2050, and up to 55 inches by the year 2100. This approach is consistent with the California Ocean Protection Council's (COPC) resolution on sea-level rise (COPC, 2011).

Carbon Dioxide and Other GHG Emissions

The global carbon cycle is made up of large carbon flows and reservoirs. Billions of tons of carbon in the form of carbon dioxide (CO_2) are absorbed by oceans and living biomass (i.e., sinks), and are emitted to the atmosphere annually through natural processes (i.e., sources). When in equilibrium, carbon fluxes among these various reservoirs are roughly balanced. Since the Industrial Revolution, which began in about 1750, global atmospheric concentrations of CO_2 have risen about 36 percent, principally due to the combustion of fossil fuels (USEPA, 2011c).

Some GHGs—such as carbon dioxide—occur naturally and are emitted to the atmosphere through natural processes such as volcanoes, forest fires, and biological processes. However, identical GHG constituents, like CO_2, can also be emitted through a variety of human activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The principal GHGs that enter the atmosphere because of human activities are CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The sources of these emissions associated with human activities are described below:

[6] Historical rate of sea-level rise in the last century was an average of 8 inches (CCCC, 2006).

- **Carbon Dioxide –** Carbon dioxide can also enter the atmosphere through the burning of fossil fuels, solid waste, trees and wood products, and as a result of other chemical reactions (e.g., manufacture of cement).
- **Methane –** Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices, and by the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide –** Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Synthetic GHGs –** HFCs, PFCs, and SF_6 are synthetic, powerful GHGs that are emitted from a variety of industrial processes. For example, SF_6 is used in magnesium processing, semiconductor manufacturing, and electrical transmission equipment (circuit breakers), as well as a tracer gas for leak detection. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (e.g., Chlorofluorocarbons (CFCs), halogenated Chlorofluorocarbons, and halons). These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as high Global Warming Potential gases (USEPA, 2011d).

The Global Warming Potential (GWP) of each GHG is the ability of that gas to trap heat in the atmosphere relative to CO_2. Total GHG emissions are expressed as carbon dioxide equivalent (CO_2e), and are the sum of the GWP-weighted emissions of each GHG.

To understand the scale of the emissions from the proposed project, it is useful to understand the extent of GHG emissions as reflected in the GHG emission inventory data for different locations. **Table 5.5-4, Greenhouse Gas Inventory Data,** presents GHG emissions for the United States, the State of California, and the City for the years 2000 and 2008. In 2008, the majority of the GHG emissions in the City come from transportation (50 percent), commercial/industrial (24 percent), and residential (20 percent) uses and activities. **Figure 5.5-1, GHG Historical Emissions and 2020 Reduction Goal,** presents the City emissions by sector for the inventory years, as well as for the CAP target year 2020.

Table 5.5-4. Greenhouse Gas Inventory Data

Emission Source	Total CO_2e Emissions[1] (tonnes/year)	
	2000	2008
United States of America	7,112,700,000	7,061,100,000
California	458,030,000	477,740,000
Santa Cruz	384,912	351,321

Sources: U.S. Environmental Protection Agency, 2011c, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009; California Air Resources Board, 2011b. Assembly Bill 32: Global Warming Solutions Act; City of Santa Cruz, 2012d, 2020 Climate Action Plan.
Notes:
1. Total GHG emissions are expressed as CO_2e and are the sum of the Global Warming Potential-weighted emissions of each GHG.
Acronyms:
GHG = greenhouse gas CO_2e = carbon dioxide equivalent

In California, approximately 25 percent of all GHG emissions come from electricity generation, 37 percent from transportation, 22 percent commercial/industrial activities, and 6 percent from residential uses and activities. Nationally, approximately 33 percent of all GHG emissions come from electricity generation, about 25 percent from transportation, 15 percent commercial/ industrial, and 5 percent from residential uses and activities.

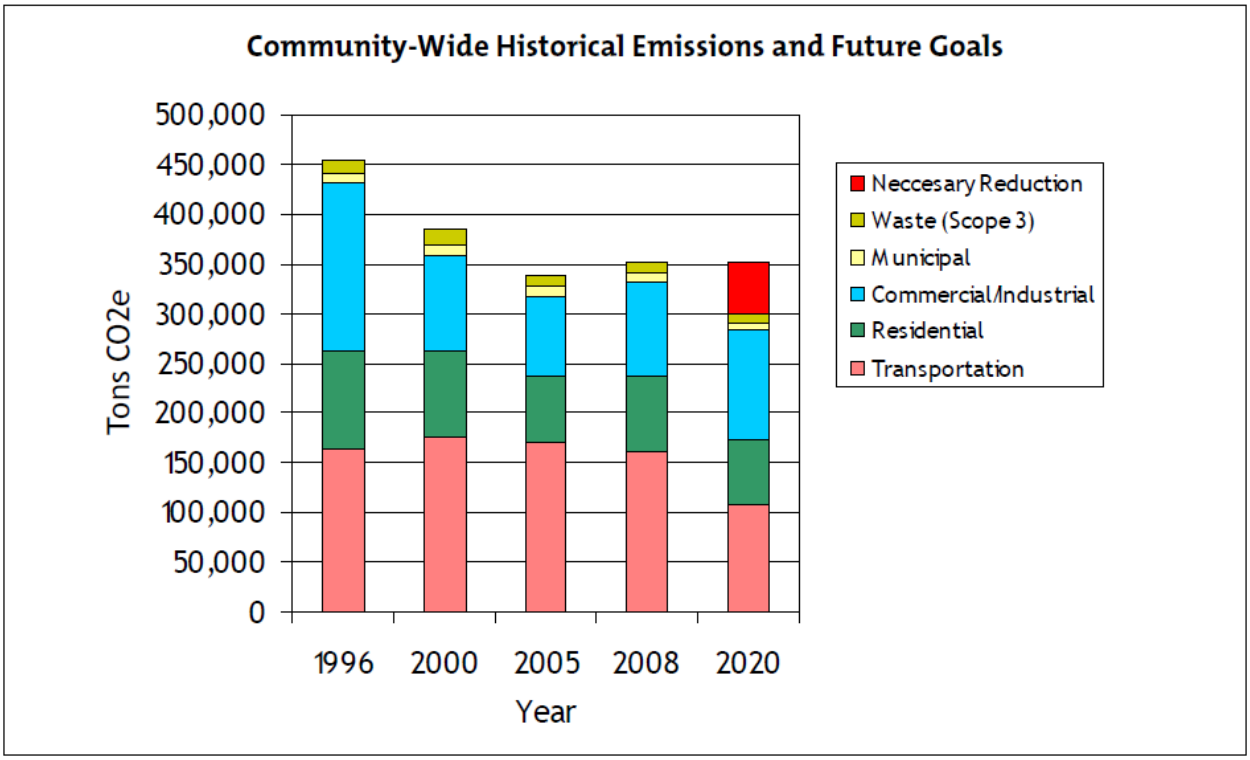

Figure 5.5-1. GHG Historical Emissions and 2020 Reduction Goal

Source: City of Santa Cruz, 2012d. 2020 Climate Action Plan.
Acronyms: CO_2e = carbon dioxide equivalent

5.5.3 Regulatory Framework

The proposed project would be subject to applicable regulations pertaining to air pollutants, TACs, and GHG/climate change. Regulations pertaining to air quality and climate in the project area that are relevant to the analysis of project impacts are detailed below. See also **Section 5.4, Land Use, Planning, and Recreation** for additional evaluation of potential conflicts with relevant land use plans, policies, and regulations of agencies that have jurisdiction over the proposed project.

Air Pollutants

Federal Clean Air Act

The Federal Clean Air Act (FCAA) and associated amendments have established the National Ambient Air Quality Standards (NAAQS). As required by the FCAA, NAAQS have been established for six major air pollutants, known as criteria pollutants (see **Table 5.5-2**). The primary standards have been established to protect public health. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

The FCAA defines nonattainment areas as geographic regions that have been designated as not meeting one or more of the NAAQS. It requires that a state implementation plan (SIP) be prepared for each nonattainment area, and a maintenance plan be prepared for each former nonattainment area that subsequently demonstrated compliance with the standards. The SIP, developed at the state level and approved by the USEPA, is a state's plan for ways it will meet the NAAQS under the deadlines established by the FCAA. The local NCCAB is in attainment for all NAAQS; however, California has a SIP related to ozone, carbon monoxide, and particulate matter. The USEPA is responsible for overseeing compliance with the FCAA.

California Clean Air Act

CARB is responsible for administering and ensuring implementation of the California Clean Air Act (CCAA), meeting state requirements of the FCAA, and establishing the California Ambient Air Quality Standards (CAAQS). CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities for controlling emission sources at the regional and county levels.

The CAAQS are generally more stringent than the corresponding federal standards, and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles (see **Table 5.5-2** above). The NCCAB is in non-attainment for the ozone and PM_{10} CAAQS, and is in attainment or unclassified for all of the other state standards.

Monterey Bay Unified Air Pollution Control District

The MBUAPCD is the regional agency responsible for comprehensive air pollution control in the NCCAB, which includes the counties of Monterey, Santa Cruz, and San Benito. The MBUAPCD adopts rules and regulations for stationary sources of air pollution, establishes permitting requirements, inspects emission sources, and enforces compliance with such measures. The MBUAPCD is required to produce plans for complying with ambient air quality standards in its jurisdiction every 3 years.

As MBUAPCD's contribution to the California SIP, three local plans have been prepared: (1) the 2008 Air Quality Management Plan (AQMP) for achieving the 2006 California O_3 standard;

(2) the 2007 Federal Maintenance Plan, for maintaining the 1997 federal O_3 standard; and (3) the 2005 Particulate Matter Plan, for particulate matter made in response to Senate Bill 656.

The only sources associated with the proposed project that require air permits from the MBUPCD are the emergency diesel generators at the desalination plant, the Morrissey pump station, the McGregor pump station, and the Aptos pump station. The proposed project is subject to the following MBUAPCD rules and regulations:

- **Regulation II: Permits**. New emission sources shall obtain a separate written authority to construct for each permit unit from the Air Pollution Control Officer. An authority to construct shall remain in effect until the permit to operate is granted or denied or the application is cancelled. The emergency diesel generators are the only sources that would require an air permit, although they are exempt from the offset requirements, since the primary use is for emergency power and they would be tested less than 60 hours per year. Additionally, emissions from these sources would be low enough that a Best Available Control Technology analysis is not required.
- **Regulation IV: Prohibitions.** These rules would be applicable to both the construction and operation phases and limit visible emissions, emissions that would cause a public nuisance, particulate matter emissions, sulfur compounds and NO_X from combustion equipment, and sulfur content of fuels. For example, Rule 426, "*Architectural Coatings,*" prohibits the usage of architectural coatings with a VOC content in excess of established limits. Architectural Coatings which do exceed established VOC content limits are prohibited from usage, manufacture, and sale within the MBUAPCD jurisdiction area.

City of Santa Cruz Municipal Code

The City addresses odors and pollutants in its Municipal Code. Section 24.14.264 of the Municipal Code prohibits emission of odorous gases or matter in quantities readily detectable. Section 24.14.272 of the Municipal Code prohibits emissions from any source that exceed permissible amounts or limits established by the MBUAPCD.

Toxic Air Contaminants

The California Health and Safety Code [HSC] (Section 39655) defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health." Substances identified in California as TACs are those listed in Title 17 of the California Code of Regulations (Sections 93000 and 93001). The majority of those TACs listed are also listed as hazardous air pollutants under the FCAA.

Project construction equipment would be required to comply with CARB's Airborne Toxic Control Measures and Off-Road Diesel Vehicle Regulation emission reduction programs, which are focused on reducing diesel emissions.

GHG and Climate Change

U.S. Environmental Protection Agency

USEPA requires mandatory reporting of GHG emissions from large sources (facilities that emit 25,000 metric tons of or more per year of GHGs) in the U.S (USEPA, 2011e). The gases covered by the Mandatory Reporting Rule are CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, and other fluorinated gases, including nitrogen trifluoride and hydrofluorinated ethers. This will affect electrical generation sources that contribute to the California electric grid, and may affect the state SIP, but will not directly apply to the proposed project, because direct GHG emissions from the project would be less than 25,000 tonnes per year.

The Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the FCAA (USEPA, 2011f) states that current and projected concentrations of the six key well-mixed GHGs in the atmosphere—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—threaten the public health and welfare of current and future generations. Furthermore, it states that the combined emissions of these well-mixed GHGs from new motor vehicle engines contribute to GHG pollution, which threatens public health and welfare.

USEPA has moved forward under the endangerment finding by developing vehicle emission standards under the FCAA. The USEPA and the Department of Transportation's National Highway Traffic Safety Administration have issued a joint proposal to establish a national program consisting of new emission standards for light-duty vehicles, model year 2012 through 2016, that will reduce GHG emissions and improve fuel economy. This new regulation marks the first GHG standards adopted under the FCAA as a result of the endangerment and cause or contribute findings.

State Assembly Bill 1493 (Pavley)

In 2002, with the passage of AB 1493, California launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires CARB to develop and implement regulations to reduce automobile and light-truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009 model year. The standards were adopted by CARB in 2004. When fully phased in, the 2009-2012 near-term standards will result in a 22 percent reduction in GHG emissions, as compared to 2002 GHG emissions. The 2013-2016 mid-term standards will result in a 30 percent reduction in GHG emissions. Although litigation was filed challenging these regulations, and USEPA initially denied California's related request for a waiver, the waiver request has now been granted by the USEPA.

State Executive Order S-3-05

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this executive order is to reduce California's GHG emissions to year 2000 levels by 2010; 1990

levels by 2020; and 80 percent below the 1990 levels by 2050. Executive Order S-3-05 also calls for the California Environmental Protection Agency's (Cal-EPA's) Climate Action Team (CAT) to prepare biennial science reports on the potential impact of continued global warming on certain sectors of the California economy. The CAT members also work to coordinate statewide efforts to implement global warming emission reduction programs, and the state's Climate Adaptation Strategy. The CAT members are state agency secretaries and the heads of agencies, boards, and departments, led by the Secretary of Cal-EPA.

The first Climate Action Team Report to the Governor and the legislature was released in March 2006. This report laid out specific emission reduction strategies for reducing GHG emission, and reaching the targets established by the Executive Order, and further defined under the Global Warming Solutions Act of 2006 (AB 32). The most recent report was released in December 2010.

State Assembly Bill 32

In 2006, the goal of Executive Order S-03-05 was further reinforced with the passage of AB 32, the Global Warming Solutions Act of 2006. AB 32 sets overall GHG emissions reduction goals. Similar to Executive Order S-3-05, AB 32 requires that GHG emissions be reduced to 1990 levels by 2020. AB 32 further mandates that CARB create a plan, which includes 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 Team (CARB, 2013). Among AB 32's specific requirements are the following:

- **Scoping Plan –** CARB shall prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions from sources or categories of sources of GHGs by 2020 (HSC Section 38561). The scoping plan, prepared by CARB on December 12, 2008, provides the outline for future actions to reduce GHG emissions in California via regulations, market mechanisms and other measures (CARB, 2008). The key elements of the Scoping Plan for reducing GHG emissions to 1990 levels by 2020 include the following:
    - Expanding and strengthening existing energy efficiency programs (e.g., green building design), as well as building and appliance standards.
    - Achieving a statewide renewables energy mix of 33 percent, consistent with Executive Order S-14-08 adopted on November 17, 2008 (less than a month prior to adoption of the Scoping Plan (see further description below).
    - Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system. This program has now been enacted and covers major sources of GHG emissions in the state contributing 85 percent of California's GHG emissions, such as refineries, power plants, industrial facilities, and transportation fuels. The regulation includes

an enforceable GHG cap that will decline over time. CARB will distribute allowances, which are tradable permits, equal to the emission allowed under the cap.

- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard. This program has now been enacted under Executive Order S-1-07 (see description below).
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long term commitment to AB 32 implementation.

- **2020 Emissions Limit –** Identify the statewide level of GHG emissions in 1990 to serve as the emissions limit to be achieved by 2020 (HSC Section 38550). In December 2007, the CARB approved the 2020 emission limit of 427 million tonnes CO_2e of GHG.
- **Mandatory Reporting Requirements –** Adopt a regulation requiring the mandatory reporting of GHG emissions (HSC Section 38530). In December 2007, CARB adopted a regulation (California Code of Regulations Title 17 – Section 95100-95158) requiring the large industrial sources to report and verify their GHG emissions. The regulations, which were revised and adopted by CARB on January 1, 2013, apply to the stationary combustion sources with operational emissions equal to or greater than 10,000 CO_2e tonnes/year. The reporting regulation serves as a solid foundation to determine GHG emissions and track future changes in emission levels.

GHG emissions from the operation of the proposed project are well below the AB 32 reporting threshold of 10,000 tonnes per year; therefore, the proposed project is not subject to the AB 32 reporting requirements. Although the proposed project is not subject to AB 32, the GHG emissions associated with the electricity that would be purchased from Pacific Gas and Electric Company (PG&E) would be subject to AB 32 reporting requirements and the renewable energy and cap-and-trade programs (see the California Renewable Energy Executive Order, below, for additional information). Given these requirements, PG&E's GHG emissions are projected to decline over time.

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

Executive Order S-1-07 was issued on January 18, 2007. The purpose of this regulation is to implement a low carbon fuel standard, which will reduce GHG emissions by reducing the full fuel-cycle carbon intensity of the transportation fuel pool used in California by at least 10 percent by 2020. The low carbon fuel 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 emission using the most economically feasible methods. All fuel sold in California must comply with this standard.

State Senate Bill 97

In 2007, the California legislature passed SB 97, to amend the CEQA statute to specifically establish that GHG emissions and their impacts are appropriate subjects for CEQA analysis. The Natural Resources Agency adopted the amendments in January 2010, which went into effect in March of the same year. CEQA does not define the thresholds of significance against which an impact should be judged. In keeping with this approach, the amendments to the CEQA Guidelines do not identify a threshold of significance for GHGs, methods of analyses, or specific mitigation measures. Rather, the amendments reinforce the discretion provided to lead agencies under CEQA to make their own determinations based on substantial evidence. See **Section 5.5.4, Impacts and Mitigation Measures,** for additional information about the amended CEQA Guidelines related to GHG emissions and global climate change.

State Executive Orders S-14-08 and S-21-09 (Renewable Energy Executive Orders)

On November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08, which raised California's renewable energy goals to 33 percent by 2020 and improved processes for licensing renewable projects. The following year, Executive Order S-21-09 directed CARB, under its AB 32 authority, to enact regulations to achieve the goal of 33 percent renewables by 2020.

State Senate Bill X1-2

The goal of achieving a 33 percent renewable electricity portfolio by 2020 was given the force of codified statutory law in April 2011, with Senate Bill X1-2 (CEC, 2011). This statute requires that all retail suppliers of electricity in California serve 33 percent of their electrical load with renewable energy by 2020. This requirement applies to PG&E, the supplier that would provide electricity for the proposed project.

City of Santa Cruz Climate Action Plan

The Santa Cruz City Council adopted the *2020 Climate Action Plan* (CAP) in October 2012 (City, 2012d), with the goals of: (1) reducing GHG emissions in the City by 30 percent by 2020 and 80 percent by 2050, compared to 1990 levels; and (2) all new buildings to be GHG emissions neutral by 2030 based upon policies and actions identified in the adopted *City of Santa Cruz General Plan 2030* (City, 2012c). This plan will assist the City in meeting and surpassing the California GHG reduction goals under AB 32. The plan incorporates the baseline GHG emissions inventory, which sets the initial levels of emissions that are the basis for all reduction goals. The baseline emissions inventory is based on 1996 data, because the City did not have enough historical data to support an inventory for 1990. The City used a 1 percent annual growth rate in emissions, as recommended by the state, to calculate estimated emissions for 1990. The

CAP estimates that the Santa Cruz community emitted 427,280 tons of CO_2e in 1990. To meet the reduction goals above, the CAP indicates that community-wide emissions in 2020 would have to be no higher than 299,096 tons of CO_2e. The CAP calls for the municipal sector emissions to be reduced from 10,261 CO_2e in 2008 to 6,683 tons of CO_2e in 2020, which includes all City departments and facilities.

The CAP includes the following specific strategies and measures that would be applicable to the municipal sector of the City, which includes the City Water Department:

- Form a Santa Cruz Municipal Energy Management Office to coordinate energy use practices, efficiency upgrades, and future investment in renewable energy among departments and services.
- Implement the Energy Efficiency Conservation Strategy (EECS) to reduce energy use in municipal buildings by an additional 40 percent by 2020.
- Integrate new energy-efficient equipment and reduction measures into the EECS for the Water Department to reduce energy use 10 percent below 2005 values.
- Reduce City fleet vehicle emissions by 20 percent by 2020.
- Implement an updated City Water Conservation Plan to maximize water use efficiency.
- Increase or establish use of rainwater catchment and reclaimed/gray water, where appropriate.
- Develop a Renewable Energy Plan as part of the EECS to coordinate departmental investment in renewable energy to reach a 33 percent locally generated renewable energy portfolio by 2020.

The CAP does not apply to individual projects, and does not include actions or measures that would be required on a project-by-project basis. However, programs and measures will be implemented to meet the municipal objectives above.

5.5.4 Impacts and Mitigation Measures

This section contains the evaluation of potential environmental impacts associated with the proposed project related to air quality and climate change. The section identifies the standards of significance used in evaluating the potential environmental effects, the methods used in conducting the analysis, and a detailed evaluation of impacts for the proposed project and any potential future expansion.

Standards of Significance

Based on CEQA Guidelines Section 15065; Appendix G of the CEQA Guidelines; applicable agency plans, policies, and/or guidelines; and agency and professional standards; the proposed project would cause a significant impact related to air quality and climate change if it would:

Air Quality

5a. Conflict with or obstruct implementation of the applicable air quality plan.

5b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation (see **Table 5.5-5** and **Table 5.5-6** for thresholds).

5c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

5d. Expose sensitive receptors to substantial pollutant concentrations.

5e. Create objectionable odors affecting a substantial number of people.

Greenhouse Gases and Climate Change

5f. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

5g. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Analysis Methodology

The above standards of significance are assessed as the basis for determining the significance of impacts related to air quality and climate change. Additional detail about the implementation of the above standards of significance and methodology for the evaluation is provided below, based on guidance from the MBUAPCD (MBUAPCD, 2008; Craft, pers. comm., 2011; Clymo, pers. comm., 2012). If necessary, mitigation measures are proposed to reduce impacts to acceptable levels.

Impact Significance

Air Quality Plan Conflicts and Cumulative Impacts

The first standard of significance above addresses conflicts with the applicable air quality plan (standard 5a), which for the proposed project is the 2008 AQMP of the MBUAPCD, identified in **Section 5.5.3**. Consistency determinations with the AQMP are used by the District to address a project's cumulative impact on regional air quality (e.g., ozone levels), as described above in standard 5c. Projects that are not consistent with the AQMP have not been accommodated in the AQMP, and will have a significant cumulative impact on regional air quality unless emissions are totally offset (MBUAPCD, 2008).

Consistency of direct emissions associated with equipment or process operations of a commercial, industrial, or institutional facility subject to District permit authority is determined by assessing whether the emission source complies with all applicable District rules and

regulations, including emission offset and emission control requirements, and/or whether or not project emissions are accommodated in the AQMP. Emissions from sources not subject to District permit authority may be deemed consistent with the AQMP if such emissions are forecasted in the AQMP emission inventory. The District was contacted and provided a consistency determination for this project, as further described in Impact 5.5-1.

Violation or Contribution to Violation of Air Quality Standards

The MBUAPCD has established quantitative significance thresholds for both the construction and operational phases of the project, which are further described below. Projects that exceed these thresholds are considered significant because the emissions could significantly impact the attainment and/or maintenance of applicable AAQS by impacting regional air quality (standard 5b) (MBUAPCD, 2008).

Construction activities (e.g., excavation, grading, on-site vehicles) that would directly generate 82 pounds per day or more of PM_{10} would have a significant impact on local air quality when they are located nearby and upwind of sensitive receptors. Construction activities below the screening-level thresholds (shown in **Table 5.5-5, Thresholds of Significance for Construction PM_{10} Impacts**) are assumed to be below the 82-pound-per-day threshold of significance.

Table 5.5-5. Thresholds of Significance for PM_{10} Construction Impacts

Source	Threshold of Significance
Construction PM_{10} Emissions – excavation, grading, on-site vehicles	82 pounds per day
Activity	Potential Screening-Level Threshold[1]
Fugitive Dust – Construction site with minimal earthmoving	8.1 acres/day
Fugitive Dust – Construction site with earthmoving (grading, excavation)	2.2 acres/day

Source: Monterey Bay Unified Air Pollution Control District, 2008. CEQA Air Quality Guidelines.
Notes:
1. Construction projects below the screening-level thresholds shown above are assumed to be below the 82-pound-per-day threshold of significance; projects with activity levels higher than those above may have a significant impact on air quality.
Acronyms: PM_{10} = particulate matter less than 10 microns in diameter or less

The MBUAPCD does not have construction thresholds of significance for other criteria pollutants, such as CO, VOC, and NO_X. According to the MBUAPCD, projects using typical construction equipment such as dump trucks, scrappers, bulldozers, compactors and front-end loaders that temporarily emit precursors of ozone (i.e., VOC or NO_X), are accommodated in the emission inventories of state- and federally-required air plans, and would not have a significant impact on the attainment and maintenance of ozone AAQS (MBUAPCD, 2008). Therefore, emissions of these criteria pollutants during construction that uses typical equipment would not cause or substantially contribute to the violation of other state or national AAQS.

The thresholds of significance for operational impacts are presented in **Table 5.5-6, Thresholds of Significance for Operational Impacts**. These thresholds apply to all indirect and direct emissions of criteria air pollutants from a project during operation.

Table 5.5-6. Thresholds of Significance for Operational Impacts

Source	Threshold of Significance
VOC	137 pounds per day (direct + indirect)
NO_x as NO_2	137 pounds per day (direct + indirect)
PM_{10}[1]	82 pounds per day (onsite)
CO	LOS at intersection/road segment degrades from D or better to E or F or volume/capacity ratio at intersection/ road segment at LOS E or F increases by 0.05 or more or delay at intersection at LOS E or F increases by 10 seconds or more or reserve capacity at unsignalized intersection at LOS E or F decreases by 50 or more
	550 pounds per day (direct)
SO_x as SO_2	150 pounds per day (direct)

Source: Monterey Bay Unified Air Pollution Control District, 2008. CEQA Air Quality Guidelines.
Notes:
1. The Monterey Bay Unified Air Pollution Control District does not have a separate threshold of significance for $PM_{2.5}$; the basin is in attainment for the state standard and unclassified/attainment for the federal standard.
Acronyms:
CO = carbon monoxide
LOS = Level of Service
NO_2 = nitrogen dioxide
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter or less
PM_{10} = particulate matter less than 10 microns in diameter or less
SO_2 = sulfur dioxide
So_x = sulfur oxides
VOC = volatile organic compound

Exposure of Sensitive Receptors to TACs or Other Pollutants

The MBUAPCD CEQA Guidelines indicate that significant effects related to exposure of sensitive receptors to substantial pollutant concentrations (standard 5d) would occur if the project causes a violation of any CO, PM_{10}, or TAC standards at an existing or reasonably foreseeable sensitive receptor. Therefore, these constituents will be considered in this assessment, as relevant (see Impact 5.5-4).

Greenhouse Gas Emissions

As described in **Section 5.5.2, Environmental Setting**, GHG emissions from human activities are contributing to global climate change, which is having adverse effects on the environment. These global effects are cumulative effects associated with past, present, and future development and other activities worldwide, and cannot be specifically tied to a particular project's GHG emissions. The evaluation of GHG emissions in this EIR will determine whether the proposed project's incremental contribution to global climate change, if any, could be cumulatively considerable. If so, the impact would be considered significant under CEQA.

The amendments to the CEQA Guidelines that resulted from SB 97 indicate that a lead agency should consider the following factors when assessing the significance of impacts from GHG emissions on the environment:

- The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting.
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.

- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (Section 15064.4(b)).

Therefore, the standards of significance for GHG emissions (standards 5f and 5g) should be evaluated with the above factors in mind.

The MBUAPCD does not have adopted thresholds for GHG emissions and none of the available thresholds of nearby or similar districts were found to be applicable to the proposed project (URS, 2013; Dudek, 2013). However, in April 2012, MBUAPCD staff recommended a threshold of 10,000 metric tons of CO_2e per year for stationary source projects and a threshold of 2,000 metric tons of CO_2e per year for land-use projects. As of February 2013, the MBUAPCD staff recommended threshold for stationary source projects remains 10,000 metric tons of CO_2e per year. The MBUAPCD previously recommended threshold of 2,000 metric tons of CO_2e per year for land-use projects is still undergoing further review. As such, the MBUAPCD recommends land-use projects comply with an adopted GHG Reduction Strategy/Climate Action Plan. A GHG threshold has not yet been adopted by the MBUAPCD (MBUAPCD, 2013b). However, as further described below, the proposed project would not increase the GHG emissions as compared to the existing environmental setting, so a numeric threshold of significance for GHG emissions is not needed to evaluate the significance of the GHG impact.

The City Council and the District Board of Directors have agreed via resolution that the proposed project would be **net carbon neutral** (City, 2012e; District, 2012b). This means that the proposed project would be designed and operated in such a manner that there would be no net increase in GHG emissions, as compared to the existing environmental setting. The existing environmental setting (also called the baseline) consists of the GHG emissions generated by the existing water supply systems of the City and the District in 2010, the date that the Notice of Preparation was issued for the proposed project. The net carbon neutral objective of the project would also apply to construction GHG emissions. The commitment and approach to achieving net carbon neutrality is incorporated into the project definition and environmental design features, as provided for in **Section 4**. The approach for achieving net carbon neutrality is presented in **Appendix O,** and incorporated into the analysis of GHG emissions provided in this section.

Air Quality and Climate Evaluation

Criteria Air Pollutants

Construction Methodology. Construction criteria pollutant emissions were calculated by using a combination of emission models and emission factors. These models included EMFAC2011, OFFROAD 2011 and 2007 (because 2011 does not calculate all pollutants), and emission factors from USEPA AP-42, South Coast Air Quality Management District CEQA Guidebook, and California Emissions Estimator Model (CalEEMod). Each model calculates emissions for a different type of source. Details regarding the source types and models used are available in

Appendix T-1, scwd² Regional Seawater Desalination Project EIR Construction Emissions. Also included in **Appendix T-1** are the equipment inventory, assumptions, and all data used to calculate construction-related emissions.

Construction emissions for the desalination plant and the various components of the project were calculated individually and separated into on-site and off-site categories. On-site emissions are defined as the exhaust and fugitive emissions generated by stationary, mobile, and area sources at the various construction sites. Off-site emissions are referred to as the emissions from mobile sources that travel to/from the various construction sites. In general, due to the distances that separate each construction activity, it is unlikely that potential impacts from each area of construction would combine to cause a significant impact. However, to be conservative, the emissions from each area of construction were combined, and compared to the PM_{10} construction significance threshold.

The evaluation of construction emissions is based on the alternative component determined to result in the worst-case construction emissions. For example, construction emissions were estimated for Plant Site A-3 because it is the site alternative with the largest footprint. Therefore, this site would have the maximum amount of earthwork, and thus the maximum amount of fugitive dust. Likewise, because SI-9 and SI-17 would have the longest transfer pipeline routes, these sites were selected to represent the worst-case intake construction.

Operational Methodology. Operational criteria pollutant emissions were calculated in a spreadsheet using a combination of the following models: EMFAC2011, OFFROAD 2011, and 2007 (because 2011 does not calculate all pollutants), and USEPA Interim Tier IV emission factors for the emergency generators. Regardless of the alternative components selected, the operational emissions would be the same; therefore, only one operational scenario was examined.

Direct emissions of criteria pollutants come from testing the emergency generators, area sources such as heating, and on-site mobile sources such as worker vehicles, delivery trucks, and forklifts. Indirect emissions come from the commuter vehicles and the delivery trucks[7]. Vehicle emissions were estimated for the peak day, using an estimate of 14 commuter vehicles per day, and 6 delivery trucks per day.

Congested intersections and roadways may result in localized, high concentrations of CO, commonly known as CO hotspots, which can exceed state and federal AAQS (MBUAPCD, 2008). Because vehicles have become cleaner over the years, vehicular CO emissions have reduced significantly, and it is now uncommon for localized, high concentrations of CO to occur

[7] Based on the definition in MBUAPCD CEQA Guidelines, the indirect emission sources should not include emissions from electricity generated by power plants used to serve the project. Criteria pollutant emissions from power plants have already been addressed by CEQA and local air permitting programs. Therefore, the power-plant–related criteria pollutant emissions were not included in this analysis to avoid double-counting.

even at congested intersections. No CO hotspot analysis was conducted for operations due to the small quantity of traffic associated with the proposed project. As described in **Section 5.12, Traffic and Transportation**, project traffic would not significantly affect levels of service (LOS) at intersections or road segments, and would not exceed the MBUAPCD's screening-level thresholds for CO modeling (see **Table 5.5-6**). Operational emissions calculations and details, including the emission models used are available in **Appendix T-2, scwd² Regional Seawater Desalination Project EIR Operational Emissions**.

Toxic Air Contaminants

The primary TACs of concern from construction equipment exhaust are diesel particulate matter and acrolein. The construction fleet would be required to comply with the CARB's Airborne Toxic Control Measures and off-road equipment rules, which would greatly reduce TAC emissions and associated health risk impacts. Therefore, as discussed with MBUAPCD staff (Craft, pers.comm., 2011), application of these rules would limit TAC emissions associated with project construction, and the impact should be less than significant; therefore, no Health Risk Assessment will be necessary to evaluate health risks from these limited emissions. Likewise, no Health Risk Assessment was conducted for operations due to the very limited equipment with TAC emissions associated with the proposed project.

Greenhouse Gases and Climate Change

Construction Methodology. Construction GHG emissions were calculated by using a combination of emission models and emission factors. These models included EMFAC2011, OFFROAD 2011 and 2007 (because 2011 does not calculate all pollutants), and the California Climate Action Registry General Reporting Guidance (CCAR, 2009). Each model calculates emissions for a different type of source. Details regarding the source types and models used are available in **Appendix T-1**. Also included in **Appendix T-1** are the equipment inventory, assumptions, and all data used to calculate construction-related GHG emissions.

Construction GHG emissions would be generated by construction equipment and construction vehicles. Similar to the construction analysis for criteria air pollutants, the evaluation of construction GHG emissions is based on the alternative component determined to result in the worst-case construction emissions. As indicated above, the net carbon neutral objective of the project would also apply to construction GHG emissions, as further described in Impact 5.5-5.

Operational Methodology. As indicated above, the proposed project would be designed and operated so that there would be no net increase in GHG emissions from each agency's water system, as compared to the existing environmental setting or baseline in 2010. To assess the net increase in GHG emissions that would result if and when the proposed project were to come on line, the EIR evaluation determines the extent to which the project would increase or reduce GHG emissions, as compared to the existing environmental conditions. The addition of desalinated product water to the water supply portfolios of both agencies results in changing operations of traditional sources (e.g., reduced groundwater pumping) that, in turn, reduce

energy use and GHG emissions of those traditional sources. Therefore, in order to provide a comparison of the effects of the proposed project against existing conditions under CEQA, the GHG emissions associated with the total water supply portfolio of each agency in 2010 (surface and groundwater production) are compared to the GHG emissions associated with the total water supply portfolio (surface, groundwater and supplemental desalination production) in the assumed first year of operation, 2016[8]. Using this approach, the net increase in energy use and associated GHG emissions can be determined. The net increase in GHG emissions is the amount that would need to be offset to achieve the net carbon neutral objective of the proposed project.

To establish the baseline, metered annual flows and PG&E electrical consumption were compiled for 2010. The published 2010 PG&E emissions factor of 446 pounds CO_2e per megawatt-hour (MWh) was used to determine the baseline indirect GHG emissions associated with each agency's traditional water supply production. Direct GHG emissions associated with the existing water systems (e.g., emergency generators, vehicles) are not included in the 2010 baseline, which provides for a conservative assessment of the net increase in emissions with the proposed project.

Direct GHG emissions associated with the proposed project would be generated by the emergency generators, area sources (e.g., heating), and mobile sources (on-site and off-site travel); while indirect emissions come primarily from the purchased electricity, and water use and waste removal[9]. Vehicle emissions were estimated for the peak day; annual emissions were based on 80 percent of the vehicular traffic of a peak day. To calculate indirect GHG emissions from the project in 2016, the assumed first year of operation, PG&E's estimated emissions factor for 2016 (370 pounds CO_2e/MWh) was used, based on the California Public Utilities Commission GHG Calculator (CPUC, 2010). The California Public Utilities Commission Emissions Calculator provides an independent forecast of PG&E's emissions factors as part of a model on how the electricity sector would reduce emissions under AB 32. The GHG emissions associated with the purchased electricity from PG&E will continue to decrease with time as PG&E complies with AB 32 and the California Renewable Energy Executive Order. Vehicle emissions will be reduced over time by the implementation of AB 1493 (Pavley) and the low carbon fuel standard.

California Energy Commission water-related energy use emission factors were used for the actual water use associated with the operation of the desalination plant, including domestic use and process water, as described in **Section 5.9, Utilities and Service Systems**.

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[8] 2016 is used as the earliest likely start-up year to provide a conservative estimate of GHG emissions. If the first year of operations is later than 2016, GHG emissions associated with project operation will be reduced as PG&E complies with AB 32 and the California Renewable Energy Executive Order.

[9] The definition of direct and indirect emission sources for GHG varies from the criteria pollutant use of these terms.

GHG emissions from indirect electricity use were calculated for two scenarios during the assumed first year of operation (2016): (1) normal year conditions with maximum water production from the desalination plant going to the District; and (2) drought conditions with maximum water production from the desalination plant being allocated to both the City and the District per the Priority of Use Schedule outlined in the agreement adopted by the City and the District in 2010 (**Appendix P, City of Santa Cruz and Soquel Creek Water District Agreements Related to the Proposed Seawater Desalination Project**). Although it is not expected that the desalination plant would be running at maximum capacity year round, for the purposes of CEQA, this condition was evaluated because it represents the worst-case operational condition, given the proposed capacity of the plant.

Future water demand projections used in the calculations are based on those published in the 2010 Urban Water Management Plans of the City and the District. The total project emissions are based on the electricity needed to produce 2.5 million gallons per day (mgd) for an entire year, plus the maximum electricity usage expected for ground and surface water pumping and treatment required under the two scenarios, multiplied by the PG&E emission factor for 2016. Other indirect and direct emissions are also accounted for. The drought scenario assumes that 15 percent curtailment is implemented, per City and District policies, between May and October. Therefore, it is assumed that system-wide demand would decrease accordingly if 2016 is designated a critically dry drought year.

The net increase in GHG emissions that would result from the proposed project is calculated below by subtracting the 2010 GHG baseline emissions from the 2016 GHG emissions associated with the City and District water supply systems. For the purposes of this EIR two options are presented and evaluated for reducing the net increase in GHG emissions associated with the proposed project such that the net carbon neutral objective can be met. These two options are incorporated into **Section 4,** and described below in Impact 5.5-5.

Operational emissions calculations and details are available in **Appendix T-2**. **Appendix O** provides details regarding the GHG emissions of the proposed project, and the approach to reducing those emissions.

Impacts and Mitigation

This section provides a detailed evaluation of air quality and climate change. The air quality impact analysis addresses conflicts with the applicable air plan and cumulative impacts (standards 5a and 5c), violation or substantial contribution to a violation of any air quality standard (standard 5b), exposure of sensitive receptors to substantial pollutant concentrations (standard 5d), and creation of objectionable odors (5e). The climate change impact analysis addresses the generation of GHG emissions and conflicts with applicable GHG reduction plan, policy, or regulation (standards 5f and 5g).

The impacts to air quality and climate change are summarized in **Table 5.5-7, Summary of Potential Air Quality and Climate Impacts**, and are categorized as either “not applicable,” “no

impact," "less than significant impact," "less than significant impact with mitigation," or "significant and unavoidable impact." Given that the emissions for the project as a whole need to be assessed and compared to the significance thresholds to determine the impact significance, the impact analysis and results provided in **Table 5.5-7** do not present impacts for each individual project component as is done for other topics in this EIR, unless relevant to the particular impact. The detailed analysis of air quality and climate change impacts and mitigation measures follows this table.

Table 5.5-7. Summary of Potential Air Quality and Climate Impacts

Impacts	LEVEL OF SIGNIFICANCE													
	Seawater Intake Site Alternatives								Plant Site Alternatives			Other Components	Project Overall	Possible Future Expansion
	SI-4	SI-5	SI-7	SI-9	SI-14	SI-16	SI-17	SI-18	A-1	A-2	A-3			
5.5-1: Conflicts with Air Quality Plan	--	--	--	--	--	--	--	--	--	--	--	--	LTS	LTS
5.5-2: Violation of Air Quality Standards - Construction	--	--	--	--	--	--	--	--	--	--	--	--	LTS	LTS
5.5-3: Violation of Air Quality Standards - Operations	--	--	--	--	--	--	--	--	--	--	--	--	LTS	LTS
5.5-4: Sensitive Receptors	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
5.5-5: Odors	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
5.5-6: GHG Emissions and Plan Conflicts	--	--	--	--	--	--	--	--	--	--	--	--	LTS	LTS

Notes:
SU = Significant and Unavoidable Impact
LTSM = Less Than Significant Impact With Mitigation
LTS = Less Than Significant Impact
NI = No Impact
-- = Not applicable
Acronyms:
AAQS = Ambient Air Quality Standards
GHG = Greenhouse Gas Emissions

CONFLICTS WITH AIR QUALITY PLAN

Impact 5.5-1: The proposed project would not conflict with the applicable air quality plan, and therefore would not result in a cumulatively considerable net increase in any criteria air pollutants.

Significance: Less than significant

Mitigation Measures: None required.

Proposed Project

As discussed under Analysis Methodology above, consistency determinations with the AQMP are used by the MBUAPCD to address a project's cumulative impact on regional air quality. Projects that are not consistent with the AQMP are not accommodated in the AQMP, and will have a significant cumulative impact on regional air quality unless emissions are entirely offset.

Consistency of direct emissions associated with equipment or process operations of a commercial, industrial, or institutional facility subject to District permit authority is determined by assessing whether the emission source complies with all applicable District rules and regulations, including emission offset and emission control requirements; and/or whether or not project emissions are accommodated in the AQMP. After reviewing the operational and construction equipment list, MBUAPCD staff confirmed that the proposed project would be consistent with the AQMP (Clymo, 2012). Therefore, the impact would be less than significant, because the proposed project would not conflict with or obstruct implementation of the AQMP.

Potential Future Expansion

If expansion of the proposed plant and related facilities were pursued in the future, most of the additional equipment would be installed in existing structures at the plant and at the intake pump station. Additional brine storage structure(s) and dissolved air floatation (DAF) basin(s) would also be constructed at the plant, but no new structures would be built elsewhere in the project area. Given that a future expansion of the facility up to 4.5 mgd would have similar characteristics and equipment as the proposed 2.5 mgd project, it would be expected that such an expansion would also be consistent with the AQMP, and the impact would be less than significant.

Mitigation Measures

None required.

VIOLATION OF AIR QUALITY STANDARDS - CONSTRUCTION IMPACTS

Impact 5.5-2:	Construction activities associated with the proposed project would generate emissions of criteria pollutants on a short-term basis; however, these emissions would not result in violations of air quality standards.
Significance:	Less than significant
Mitigation Measures:	While not required, Mitigation Measure 5.1-1a in **Section 5.1, Hydrology and Water Quality** would also apply.

Proposed Project

Construction-related activities would generate fugitive dust, which is measured in terms of PM_{10} and $PM_{2.5}$, from earthmoving, excavation, grading, and travel on unpaved roads. The term "fugitive dust" refers to particulate matter emitted from an open area, not through a stack or exhaust vent. Particulate emissions from fugitive dust tend to vary with the level and type of activity, the silt and moisture content of the soil, and the prevailing weather conditions. Particulate emissions can also be generated by construction equipment exhaust.

Each area of construction was calculated separately and then combined to provide a conservative analysis. The emissions from each area of construction and the combination of emissions from these construction areas are presented in **Table 5.5-8, Construction Criteria Pollutant Daily Emissions**. **Table 5.5-8** presents the daily construction emissions from the combination of all areas from month 4 of the construction schedule, which was determined to have the worst-case construction emissions due to the level of effort going into the project components at this time.

The threshold of significance for construction activities is 82 pounds per day for the onsite emissions, based on MBUAPCD's 2008 CEQA Guidelines. Therefore, the peak daily PM_{10} emissions from equipment exhaust and fugitive dust from the combination of all onsite construction activities were compared to the MBUAPCD's construction PM_{10} thresholds of significance (**Table 5.5-9, Construction PM_{10} Emissions in Comparison to Threshold**). The unmitigated and mitigated emissions would be less than the threshold of significance; therefore, the impact of the proposed project related to construction PM_{10} emissions would be less than significant. Mitigation Measure 5.5-1a and 5.5-2, requiring the implementation of dust-control measures, would further reduce the impact of construction-related $PM_{10/2.5}$ emissions. These mitigation measures, however, are not needed to reduce the impact to less than significant.

Construction activities would also generate other criteria pollutants, such as CO, VOCs, and NO_X, as a result of equipment exhaust, construction vehicle and truck emissions, and so forth. As indicated previously, the MBUAPCD does not have construction thresholds of significance for these criteria pollutants. According to the MBUAPCD, construction projects using typical construction equipment are accommodated in the emission inventories of federally and state

required air plans, and would not have a significant impact on the attainment and maintenance of ozone AAQS (MBUAPCD, 2008).

MBUAPCD staff reviewed the construction equipment list and schedule, and indicated that most of the equipment is considered typical (Clymo, pers. comm., 2012). Although a few pieces of equipment might not be typical (e.g., spoil separator and barge), the emissions from these pieces of equipment would easily be covered by the AQMP inventory, given the small size of each unit and the limited use (Clymo, pers. comm., 2012). Because project-related construction emissions of other criteria pollutants are expected to already be accounted for in the emissions inventories of the MBUAPCD's air plans, these emissions would not cause or substantially contribute to the violation of other state or national AAQS. Therefore, the impact of project construction related to other criteria air pollutants would be less than significant.

Table 5.5-8. Construction Criteria Pollutant Daily Emissions

Construction Area	Maximum Daily Emissions (pounds per day)[1]					
	PM_{10}	$PM_{2.5}$[2]	CO	VOC	NO_x	SO_x
On-Site Emissions[3]						
Desalination Plant	22.04	14.64	142.42	25.00	245.17	0.33
Seawater Intake and Conveyance System, and Brine Pipeline	17.64	14.99	167.45	67.19	158.52	0.24
Potable Water Distribution System Improvements	8.51	5.79	57.51	11.74	120.26	0.16
Total Onsite Daily Emissions	48.19	35.42	367.38	103.93	523.95	0.73
MBUAPCD CEQA Threshold	82	NA	NA	NA	NA	NA
Would Project Exceed Threshold and Require Mitigation?	No	NA	NA	NA	NA	NA
Off-Site Emissions[4] (workers, delivery, mainly mobile)						
Desalination Plant	13.90	3.64	30.38	3.12	11.09	0.05
Seawater Intake and Conveyance System, and Brine Pipeline	7.04	1.89	8.25	1.00	8.95	0.02
Potable Water Distribution System Improvements	15.59	4.14	20.89	5.42	24.40	9.04
Total Offsite Daily Emissions	36.53	9.67	59.52	9.54	44.44	9.11
Total Daily Emissions	84.72	45.09	426.91	113.47	568.39	9.85

Source: Appendix T, **scwd²** Regional Seawater Desalination Project EIR Air Quality and Climate Calculations.
Notes:
1. The daily maximum construction emissions occur in month 4 for all pollutants except SO_x which occurs during month 2 with peak emissions of 12.78 pounds per day; however, for consistency emissions from all pollutants for month 4 are shown in this table. These emissions do not include the implementation of any mitigation measures.
2. $PM_{2.5}$ emissions are a subset of PM_{10} emissions.
3. On-site emissions are defined as the exhaust and fugitive emissions generated by stationary, mobile, and area sources at the various construction sites.
4. Off-site emissions are referred to as the emissions from mobile sources that travel to/from the various construction sites.

Acronyms:
CO = carbon monoxide
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in diameter or less
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter or less
SO_2 = sulfur dioxide
So_x = sulfur oxides
VOC = volatile organic compound
NA = Not applicable

Table 5.5-9. On-Site Direct Construction PM_{10} Emissions in Comparison to Threshold

Direct Emissions [1]	Total PM_{10} (pounds per day)
Daily Maximum (without mitigation measures)[2]	48.2
Daily Maximum (with Mitigation Measure 5.5-1a and Recommended Construction Specifications)[b]	37.9
MBUAPCD CEQA THRESHOLD	82
Exceed Threshold?	No

Notes:
1. The direct emissions include all the on-site sources (exhaust and fugitive dust from equipment and vehicles).
2. The daily on-site maximum PM_{10} direct emissions were calculated to occur in month 4 of the construction schedule.
Acronyms:
CEQA = California Environmental Quality Act
MBUAPCD = Monterey Bay Unified Air Pollution Control District
PM_{10} = particulate matter less than 10 microns in diameter or less

Potential Future Expansion

If expansion of the proposed plant and related facilities were pursued in the future, the majority of the additional equipment would be installed in existing structures at the plant and intake pump station. Some additional ground-disturbing activities would be involved in the construction of additional brine storage structure(s) and DAF basin(s) at the plant, but would not occur elsewhere in the project area. Given the limited extent of construction activities associated with a potential future expansion, construction emissions are expected to be substantially less than those reported above for the proposed project and would continue to be less than significant. The recommended construction specifications for air quality below would further reduce the impact.

Environmental Design Features

The environmental design features (**Section 4**, **Table 4-12**) of the proposed project related to dust control during construction include the following:

- The City and District will implement the following dust-abatement best management practices at all construction sites:
    - Water all active construction areas with exposed soil at least twice daily, as warranted, to control dust. Frequency will be based on the type of operation, soil moisture and other conditions, and wind exposure.
    - Prohibit all grading activities during periods of high wind (over 15 miles per hour).
    - Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least 4 consecutive days).

- Cover all trucks hauling dirt, sand, or loose materials. Haul trucks will maintain at least 2 feet of freeboard.
- Sweep streets if visible soil material is carried out from the construction site.
- Replace ground cover in disturbed areas as soon as possible.
- Cover inactive storage piles.

Mitigation Measures

None required. However, it is noted that Mitigation Measure 5.1-1a in **Section 5.1**, which specifies measures to be included in the required Stormwater Pollution Prevention Plan (SWPPP), includes measures for wetting of dry surfaces to prevent fugitive dust emissions, which would also apply to this impact.

VIOLATION OF AIR QUALITY STANDARDS - OPERATIONAL IMPACTS

Impact 5.5-3: Operation of the proposed project would generate emissions of criteria pollutants on a long-term basis, but would not result in violations of air quality standards.

Significance: Less than significant

Mitigation Measures: None required

Proposed Project

The operation of the proposed project would result in direct emissions (e.g., testing of emergency generators, area sources, and on-site mobile sources) and indirect emissions (e.g., commuter vehicles and delivery trucks) of criteria air pollutants. The emissions from criteria pollutants were calculated for both direct and indirect operational sources. **Table 5.5-10, Maximum Daily Operational Criteria Pollutant Emissions,** presents the maximum daily criteria pollutants emissions during operations of the proposed project if operated at full capacity (2.5 mgd).

As shown in **Table 5.5-11, Operational Criteria Pollutant Emissions in Comparison to Thresholds**, the operational emissions are well below the MBUAPCD thresholds of significance described in **Table 5.5-6**. Because the operation of the proposed project would not exceed the MBUAPCD significance thresholds, the project would not significantly impact the attainment and/or maintenance of applicable AAQS. Therefore, the impact of criteria pollutant emissions during operations would be less than significant.

Table 5.5-10. Maximum Daily Operational Criteria Pollutant Emissions

Emission Category	Maximum Daily Emissions (pounds per day)					
	PM_{10}	$PM_{2.5}$	CO	VOC	NO_x	SO_x
Direct Emissions						
Worker Vehicles (onsite travel)	0.01	0.00	0.67	0.10	0.04	0.00
Delivery Trucks (onsite travel)	0.03	0.01	0.02	0.00	0.14	0
Diesel Generators	0.06	0.06	11.18	0.61	6.39	4.86
Forklift	0.04	0.04	0.66	0.09	0.77	0.00
Heating	0.00	0.00	0.01	0.00	0.02	0.00
Consumer Products	-	-	-	1.22	-	-
Architectural Coatings	-	-	-	0.15	-	-
Direct Emissions Subtotal	0.14	0.12	12.54	2.17	7.36	4.86
Indirect Emissions						
Worker Vehicles (offsite travel)	1.07	0.28	2.79	0.26	0.27	0.01
Delivery Trucks (offsite travel)	4.63	1.18	0.33	0.10	4.45	0.01
Indirect Emissions Subtotal	5.70	1.46	3.12	0.36	4.72	0.01
Total Project	5.84	1.57	15.66	2.52	12.08	4.88

Acronyms:
CO = carbon monoxide
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in diameter or less
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter or less
So_x = sulfur oxides
VOC = volatile organic compound

Table 5.5-11. Operational Criteria Pollutant Emissions in Comparison to Thresholds

Pollutant	PM_{10}	CO	VOC	NO_x	SO_x
Emission Sources	Onsite	Direct	Direct + Indirect	Direct + Indirect	Direct
MBUAPCD CEQA Thresholds of Significance (lb/day)	82	550	137	137	150
Project Operational Emissions (lb/day)	0.14	12.54	2.52	12.08	4.86
Exceed MBUAPCD CEQA Thresholds of Significance?	No	No	No	No	No

Acronyms:
CEQA = California Environmental Quality Act
CO = carbon monoxide
lb/day = pound per day
MBUAPCD = Monterey Bay Unified Air Pollution Control District
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in diameter or less
SO_x = sulfur oxides
VOC = volatile organic compound

Potential Future Expansion

If expansion of the proposed plant and related facilities were pursued in the future, the majority of the additional equipment would be installed in existing structures at the plant, and at the intake pump station. This additional equipment would increase the pumping and treatment capacity of the plant and related facilities, and could result in a nominal increase in the direct and indirect emissions of criteria pollutants. As indicated previously, the operation of the proposed project would result in direct emissions (e.g., testing of emergency generators, area sources, and on-site mobile sources) and indirect emissions (e.g., commuter vehicles and delivery trucks) of criteria air pollutants. The additional equipment and other sources of emissions would not be expected to substantially increase the operational emissions of criteria air pollutants to the extent that the thresholds of significance identified in **Table 5.5-6** would be exceeded. Even if the emissions identified in **Table 5.5-10** were doubled with a 4.5 mgd plant, the applicable thresholds would not be exceeded. As a result, expansion of the plant up to 4.5 mgd would not significantly impact the attainment and/or maintenance of applicable AAQS. Therefore, the impact of criteria pollutant emissions during operations of an expanded plant would be less than significant.

Mitigation Measures

None required.

IMPACTS ON SENSITIVE RECEPTORS

Impact 5.5-4:	Operation of the proposed project would not generate substantial pollutant concentrations that could affect sensitive receptors.
Significance:	Less than significant
Mitigation Measures:	None required

Proposed Project

As indicated under Analysis Methodology, the MBUAPCD CEQA Guidelines indicate that a significant impact related to the exposure of sensitive receptors to substantial pollutant concentrations would occur if the project would cause a violation of any CO, PM_{10}, or TAC standard at an existing or reasonably foreseeable sensitive receptor. The potential for such a violation to occur as a result of the proposed project is evaluated below.

Criteria Air Pollutants

As described in Impacts 5.5-2 and 5.5-3, project construction and operation would emit criteria air pollutants. The MBUAPCD has set thresholds of significance to ensure compliance with the CAAQS and NAAQS, which are designed to protect the health of sensitive populations.

The construction PM_{10} threshold specifically addresses local air quality. MBUAPCD CEQA Guidelines indicates that: "Construction activities (e.g., excavation, grading, on-site vehicles) which directly generate 82 pounds per day or more of PM_{10} would have a significant impact on local air quality when they are located nearby and upwind of sensitive receptors." Dispersion modeling, which would show concentrations, is only recommended to further evaluate the impact if the above threshold is exceeded. As indicated in **Table 5.5-9**, the PM_{10} threshold would not be exceeded with the proposed project. Additionally, the proposed project would not generate high concentrations of CO, commonly known as CO hotspots, given the small quantity of traffic associated with the project.

Because project-related construction and operational emissions are below the MBUAPCD thresholds of significance, emissions of criteria pollutants would not expose sensitive receptors to substantial pollutant concentrations. Impacts would be less than significant.

Toxic Air Contaminants

As indicated previously, the primary TACs of concern from project construction equipment exhaust are diesel particulate matter and acrolein. The construction equipment would be required to comply with CARB's airborne toxic control measures and off-road equipment rules, which would reduce emissions of both diesel particulate and acrolein. The construction phase is expected to last about 32 months, and cancer risk is typically calculated based on a 70-year exposure; thus, the low TAC emissions—along with the short exposure duration—would minimize the health risk. Therefore, sensitive receptors in proximity to the project construction sites would have limited exposure to TAC emissions during construction, and the impact would be less than significant.

Operational emissions of TACs would be limited to monthly testing of the emergency generators and worker and delivery vehicle emissions. Monthly testing procedures for the proposed diesel generator system would generally consist of running the generator system for 30 to 60 minutes 1 day per month. Due to the short duration, small size of the proposed generator, and standard air filtering equipment for such units, potential emissions of TACs would be low. As indicated in **Section 5.12, Traffic and Transportation**, worker and delivery vehicle trips would be minimal, and therefore emissions from such vehicles would be limited.

Chemicals stored at the plant site and used in plant operations would be stored, handled, and used in accordance with all applicable regulations. There would be no direct sources of TACs such as stacks or fume hoods. The chemicals, including sodium hypochlorite, sodium hydroxide, carbon dioxide, monosodium phosphate, ferric chloride, sodium bisulfite, calcite, citric acid, and other cleaning chemicals are compounds that are typically used in conventional water treatment facilities (see **Section 4** and **Section 5.11, Hazards and Hazardous Materials** for additional information).

Chemicals such as chlorine gas would not be used or stored on site. Chemical storage and use at the desalination plant are not anticipated to have a significant impact on local or regional air

quality. Therefore, emissions of TACs from the operation of the proposed project would not expose sensitive receptors to substantial pollutant concentrations and the impacts would be less than significant.

Potential Future Expansion

Criteria Air Pollutants

If expansion of the proposed plant and related facilities were pursued in the future, the majority of the additional equipment would be installed in existing structures at the plant, and at the intake pump station. Some additional ground-disturbing activities would be involved in the construction of additional brine storage structure(s) and DAF basins at the plant, but would not occur elsewhere in the project area. Given the limited extent of construction activities associated with a potential future expansion, construction emissions of criteria pollutants are expected to be substantially less than those reported above for the proposed project in Impact 5.5-2, and therefore, would not result in substantial pollutant concentrations that could affect sensitive receptors. Impacts would be less than significant.

Although additional capacity associated with any future expansion would not be expected to substantially increase the operational emissions of criteria air pollutants, additional analyses would be undertaken to ensure that any expansion would not exceed the MBUAPCD's thresholds of significance, or result in substantial pollutant concentrations that could affect sensitive receptors.

Toxic Air Contaminants

For the proposed project, construction equipment associated with any potential future expansion would also be required to comply with CARB's airborne toxic control measures and off-road equipment rules, which would minimize diesel particulate matter and acrolein, and the impact would be less than significant.

The additional equipment installed would increase the pumping and treatment capacity of the plant and related facilities. This additional capacity would not be expected to substantially increase the operational emissions of TACs associated with the project, because emissions from the testing of the emergency generators and worker and delivery vehicle emissions would not be expected to substantially increase. Therefore, operational emissions of TACs from any potential future expansion of the proposed project would not expose sensitive receptors to substantial pollutant concentrations and the impact would be less than significant.

Mitigation Measures

None required.

ODOR IMPACTS

Impact 5.5-5: Operation of the proposed project would not create objectionable odors affecting a substantial number of people.

Significance: Less than significant

Mitigation Measures: None required

Proposed Project

Odors represent emissions of one or more pollutants that are a nuisance to healthy persons, and may trigger asthma episodes in people with sensitive airways. Pollutants associated with objectionable odors include sulfur compounds and methane. Typical sources of odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and refineries.

Construction

The only source of odor anticipated from the construction of the proposed project would be exhaust emissions from the diesel equipment and haul trucks. However, emissions from diesel-fueled construction equipment and vehicles would be temporary, and would not be expected to cause any odor issues that would affect a substantial number of people. Therefore, the construction impact related to odor would be less than significant.

Operation

The IWP Program EIR (City, 2005a) noted that odors are generally not a concern with water treatment plants, and the operation of the proposed desalination plant would be similar to a water treatment plant.

As indicated in **Section 4**, two options are under consideration for the handling of solids generated by the proposed project: sanitary sewer disposal, and landfill disposal. If landfill disposal is pursued, a solids dewatering facility would need to be incorporated into the proposed desalination plant. The dewatering facilities would likely consist of an outdoor (covered) sludge conditioning tank, a dewatering building to house the electrical and mechanical equipment associated with mechanical dewatering, and a loading/storage area for bins or trailers to transport the dried solids. Outdoor solar drying in ponds is not being contemplated.

Solids from the proposed desalination plant would consist primarily of inorganic constituents (e.g., silt and iron compounds from the coagulant); therefore, the anticipated solids should not produce significant odors. The building and associated filtration system would minimize the potential for any odor concerns. Therefore, the proposed project would not create objectionable odors affecting a substantial number of people. The operational impact related to odor would be less than significant.

Potential Future Expansion

If expansion of the proposed plant and related facilities were pursued in the future, construction and operation of the expanded project would also not create objectionable odors affecting a substantial number of people, for similar reasons to those described above for the proposed project. Impacts would be less than significant.

Mitigation Measures

None required.

GHG EMISSIONS AND PLAN CONFLICTS

Impact 5.5-6:	Construction and operation of the proposed project would not generate GHG emissions that would have a significant impact on the environment, or would otherwise conflict with an applicable GHG reduction plan, policy, or regulation. Therefore, the proposed project would not result in a cumulatively considerable contribution to global climate change.
Significance:	Less than significant
Mitigation Measures:	None required

Proposed Project

GHG Emissions

Construction. Construction GHG emissions would be generated by construction equipment and construction vehicles used during the construction phase of the proposed project. Construction GHG emissions for all project components have been calculated and are presented in **Table 5.5-12, Construction GHG Emissions**.

As indicated in **Section 4** and **Appendix O,** the City and District will include a GHG offset purchase program that would entail purchasing GHG offset projects that give the City and District the sole legal right to claim the GHG emission reductions from the proposed project. One GHG offset represents a reduction of one metric ton of CO_2e. In the offset market, the City and District could buy as many GHG offsets as needed to meet their GHG reduction goals. Construction-related GHG emissions will be offset by a one-time purchase of GHG offsets in the first year of project operation, which would result in no net increase in construction-related GHG emissions. Given that construction-related GHG emissions would be temporary and will be fully offset through the purchase of GHG offsets, construction-related GHG emissions would be less than significant.

Table 5.5-12. Construction GHG Emissions

	CO_2	CH_4	N_2O	CO_2e
Total Project Construction GHG (in metric tons)	11,738.38	3.38	2.82	11,864.47

Acronyms::
CH_4 = methane CO_2 = carbon dioxide CO_2e = carbon dioxide equivalent N_2O = nitrous oxide

Operations. As stated in **Section 4.0**, the seawater reverse osmosis (SWRO) product water would be highly corrosive and treated with CO_2 as a corrosion control measure. Although CO_2 is used during this process, it would not be released into the air, and would remain dissolved in the potable water. Operational GHG emissions would come from direct sources such as emergency generators, vehicles, and area sources; and indirect sources, which include purchased electricity for all system-wide operations for the City and District systems with the addition of desalination, the use of water during the desalination treatment process, and for domestic purposes at the plant, and waste handling.

The GHG emissions that would result during operations of the proposed project are provided in **Table 5.5-13, Annual Operational GHG Emissions in 2016.** This table represents the maximum GHG emission scenario that was determined to be normal year conditions in 2016, the assumed year of project startup. Emissions from the scenario for drought conditions in year 2016 are presented in **Appendix T-2**. As this table shows, the majority of the direct GHG emissions are from the worker vehicles and delivery trucks, and the majority of the indirect emissions are from the purchased electricity needed to run the desalination plant and related project facilities. Total direct and indirect sources of GHG emissions include 207.98 and 3,326.11 metric tons per year of CO_2e, respectively. Total GHG emissions associated with the proposed project amount to approximately 3,501.36 metric tons per year of CO_2e. The net increase in emissions over the 2010 baseline with the project, before any offsets or other GHG reduction projects are considered, amounts to 2,146.24 metric tons per year of CO_2e. The Net GHG Emissions were calculated from subtracting “Baseline Emissions – City and District Operations (2010)” from “Total GHG Emissions from the Project.”

As indicated previously, the City Council and the District Board of Directors have agreed via resolution that the proposed project would be net carbon neutral. This means that the proposed project would be designed and operated so that there would be no net increase in GHG emissions, as compared to the existing environmental setting. As indicated in **Section 4** and **Appendix O**, a GHG reduction project and program analysis has been conducted to review GHG reduction projects and programs that could be implemented to reduce the net increase in GHG emissions that would occur with implementation of the project. The overarching goal of the evaluation was to identify real, verifiable, and permanent GHG reduction projects and programs to ensure their feasibility in achieving the net carbon neutral reduction objective established for the proposed project. The decision and pursuit of any particular project or set of projects would occur at a later date; likely during and/or after the project approval and regulatory permitting process. Additionally, projects could be considered and pursued in the future due to changing technologies or regulations.

Table 5.5-13. Maximum Annual Operational Greenhouse Gas Emissions in 2016

Emission Category	Maximum Annual Emissions (metric tons/year)			
	CO_2	CH_4	N_2O	CO_2e
Project Direct Emissions				
Worker Vehicles (onsite travel)	1.92	0.00	0.00	1.95
Delivery Trucks (onsite travel)	1.85	0.00	0.00	1.85
Worker Vehicles (offsite travel)	58.97	0.01	0.01	63.32
Delivery Trucks (offsite travel)	106.42	0.00	0.00	106.56
Diesel Generators (4)	12.18	0.00	0.00	12.30
Forklift	18.55	0.00	0.00	18.58
Heating	3.41	0.00	0.00	3.43
Consumer Products	0.00	0.00	0.00	0.00
Architectural Coatings	0.00	0.00	0.00	0.00
Direct GHG Emissions Subtotal	203.29	0.02	0.01	207.98
Project Indirect Emissions				
Electricity Purchasing	3,289.59	0.27	0.07	3,317.55
Water Supply and Wastewater	8.49	0.00	0.00	8.56
Indirect GHG Emissions Subtotal	3,298.07	0.27	0.07	3,326.11
Project Total Emissions				
Total GHG Emissions	3,501.36	0.29	0.09	3,534.09
Project Net Emissions				
Baseline Emissions[1] - City and District Operations (2010)	1,378.10	0.09	0.03	1,387.85
Net GHG Emissions[2, 3, 4, 5]	2,123.26	0.19	0.06	2,146.24
GHG Offsets and Reduction Projects (see Table 5.5-14)	NA	NA	NA	(2,146.24)
Total Net Project Emissions				0.00

Notes:
1. The baseline consists of the GHG emissions generated by the existing water supply systems of the City and the District in 2010, the date that the Notice of Preparation was issued for the proposed project. The baseline excludes GHG emissions associated with buildings and other facilities.
2. Emissions presented are for the maximum GHG emission scenario consisting of a normal rainfall year in 2016.
3. The direct GHG emissions do not include fugitive SF_6 emissions from the circuit breakers because the project is expected to use the existing circuit breakers in the existing transmission system.
4. The Net GHG Emissions were calculated from subtracting "Baseline Emissions – City and District Operations (2010)" from "Total GHG Emissions from the Project".
5. The net GHG emissions presented in the table are higher than those identified in Appendix O as the appendix did not estimate direct GHG emissions, whereas the table above provides both direct and indirect GHG emissions.

Acronyms:
CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
GHG = greenhouse gas
N_2O = nitrous oxide
NA = Not Applicable

Therefore, for the purposes of this EIR, two options are presented and evaluated for meeting the net carbon neutral objective, including a portfolio option and a certified offsets option, as described in detail in **Section 4**. **Table 5.5-14, GHG Emissions Reductions from Portfolio and Certified Offsets Options**, provides the GHG emission reductions from these two options and demonstrates the feasibility of meeting the net carbon neutral objective, as both would be able to reduce or offset the net increase in GHG emissions from the proposed project.

Given that GHG emissions will be fully offset through the purchase of GHG offset projects, GHG emissions with the addition of the proposed project would be less than significant. Therefore, the proposed project would not result in a cumulatively considerable contribution to global climate change.

Table 5.5-14. GHG Emissions Reductions from Portfolio and Certified Offsets Options

GHG Reduction Options	CO_2e
Portfolio Option	
PV Panels at Desalination Plant	50
Micro-hydro at Graham Hill Water Treatment Plant and Newell Creek Dam	84
PV Panels at Graham Hill Water Treatment Plant	25
Certified Offset Purchase[1]	1,987
Portfolio Option Total	2,146[1]
Certified Offsets Option	
Certified Offset Purchase Total	2,146[1]

Notes:
1. The total required GHG emissions reduction identified above (2,146 CO_2e) is based on Table 5.5.13. The number is greater than that identified in Appendix O, due to the inclusion of both direct and indirect GHG emissions in the calculations provided in Table 5.5-13.

Acronyms:
CO_2e = carbon dioxide equivalent
PV = photovoltaic

Conflicts with GHG Reduction Plans or Regulations

As indicated in **Section 5.5.3**, the proposed project would not be subject to AB 32. The Scoping Plan prepared by CARB provides for the actions and programs necessary to reduce GHG emissions in California in compliance with AB 32. The Scoping Plan indicates that CARB and other state agencies shall adopt regulations and other programs to reduce GHG emissions. However, there are no regulations or programs in place at this time that would specifically apply to the proposed project. Consequently, the proposed project would not conflict with any such regulations or programs adopted to comply with AB 32. Further, the proposed project would not otherwise affect the state's ability to comply with AB 32 because it would incorporate high-efficiency design, green building design, solar power generation, and GHG offsets and/or reduction projects that would fully offset the proposed project's net GHG emissions above the 2010 baseline. Consequently, the proposed project would not conflict with AB 32, or otherwise affect the state's ability to comply with AB 32. Impacts would be less than significant.

The City adopted the 2020 CAP in October 2012 (City, 2012d). As indicated in **Section 5.5.3**, the CAP includes specific strategies that would be applicable to the municipal sector of the City, which includes the City Water Department. The CAP, however, does not apply to individual development or infrastructure projects, and does not include actions or measures that would be required on a project-by-project basis. Therefore, the CAP would not be applicable to the proposed project. Further, the proposed project would not otherwise affect the City's ability to implement the greenhouse gas reduction objectives of the CAP because it would incorporate high-efficiency design, green building design, solar power generation, and GHG reduction projects and/or certified offsets that would fully offset the proposed project's net GHG emissions above the 2010 baseline. Consequently, the proposed project would not otherwise affect the implementation of the CAP. Impacts would be less than significant.

Potential Future Expansion

GHG Emissions

If expansion of the proposed plant and related facilities were pursued in the future, the majority of the additional equipment would be installed in existing structures at the plant, and at the intake pump station. This additional equipment would increase the pumping and treatment capacity of the plant and related facilities, which would increase the GHG emissions from the project operations, primarily related to electrical energy consumption. The continued commitment by the City and the District to operate the plant so that there is no net increase in GHG emissions with the implementation of any expansion would ensure that the project's impact related to GHG emissions continues to be less than significant. However, if expansion of the proposed project is pursued in the future, additional analyses would be undertaken to ensure that the expansion would not result in unanticipated significant impacts related to GHG emissions and climate change.

Conflicts with GHG Reduction Plans or Regulations

If expansion of the proposed project is pursued in the future, additional analyses would be undertaken to ensure that the expansion would not affect implementation of GHG reduction plans or regulations in place at the time that expansion is contemplated. Assuming that any expansion would comply with applicable GHG reduction plans or regulations in place at the time, impacts would be less than significant.

Environmental Design Features

The environmental design features (**Table 4-12**) of the proposed project related to GHG emissions include the following:

- High-efficiency energy recovery devices will allow for reuse of energy at the plant;
- High-efficiency pumps and motors will reduce energy requirements;

- SWRO membrane configuration will provide for adequate water quality while minimizing system energy requirements;
- Compliance with the City's Green Building Program will allow the project to meet established sustainability goals; and
- The operation of the proposed project will be net carbon neutral, which means that it would be designed and operated so that there would be no net increase in GHG emissions as compared to the existing environmental setting. Net carbon neutral operations will be achieved through the incorporation of high-efficiency design features, and the pursuit of one of two options for offsetting the net increase in GHG emissions:
    - Portfolio Option – This would involve the installation of photovoltaic (PV) panels at the desalination plant, the potential installation of micro-hydro turbines at Graham Hill Water Treatment Plant and Newell Creek Dam, and use of existing PV panels at the Graham Hill Water Treatment Plant, in addition to the purchase of certified offsets. Other projects could also be pursued, but may require additional environmental review.
    - Certified Offsets Option – This would involve the purchase of certified offsets.
- To accommodate potential future regulatory and carbon reduction technology changes, the City and District will prepare, approve, and implement an Energy Minimization and Greenhouse Gas Reduction Plan (Energy Plan) upon successful completion of EIR certification and prior to project construction. The Energy Plan will address the content and organizational specifications outlined in **Appendix O**. While the Energy Plan will lay the ground work for managing the GHG emissions of the proposed project, the City and the District will ultimately be responsible for developing their individual GHG reduction strategies for meeting their net carbon neutral GHG reduction objective.

Mitigation Measures

None required.