4.11 Greenhouse Gas Emissions

This section evaluates issues related to greenhouse gas (GHG) emissions resulting from implementation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project). The section presents an overview of climate change; describes the various GHGs that have been identified as sources of climate change; discusses pertinent regulations, including those relevant at the federal and state levels; identifies the criteria used for determining the significance of environmental impacts; and analyzes the potential GHG impacts that would be associated with implementation of the MPWSP. Mitigation measures are prescribed to address significant impacts. For discussion of effects related to climate change-induced sea level rise, refer to the *Coastal Flooding and Sea Level Rise* discussion in Section 4.3.1.4 and Impact 4.3-11, *Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise*, in Section 4.3.5.2.

The CPUC received several comment letters related to the GHG emissions analysis in the April 2015 Draft EIR. Some commenters requested that emissions generated during periodic maintenance of the subsurface slant wells be included in the operational emissions. Subsequent to the release of the April 2015 Draft, the layout for the seawater intake system at the CEMEX active mining area was modified such that the well heads, valves, and other slant well facilities are now aboveground and readily accessible for maintenance, thereby reducing the disturbance activities and related GHG emissions associated with periodic maintenance. See Impact 4.11-1 for a quantification of GHG emissions associated with project operations, including emissions from slant well maintenance. Other commenters questioned the efficacy of the mitigation measures that were identified to reduce GHG emissions and suggested that CalAm be required to purchase offsets from the State's cap-and-trade program to lower the project's emissions to less than significant and comments were received requesting that CO_2 degassing from intake water to the atmosphere be analyzed. These issues are addressed under Impact 4.11-1.

As a result of comments received on the January 2017 Draft EIR/EIS, revisions have been made to this EIR/EIS section and include:

- *Revision of Mitigation Measure 4.11-1 to require net zero indirect emissions from electricity use during operation (reducing the significance of all impacts related to greenhouse gas emissions from significant and unavoidable to less than significant with mitigation).*

4.11.1 Setting/Affected Environment

The study area for impacts related to GHGs is the state of California.

4.11.1.1 Climate Change

Overview

There is scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Gases that trap heat in the atmosphere are often called GHGs. Emissions of GHGs, if not sufficiently curtailed, are likely to contribute further to increases in global temperatures. The potential effects of climate change in California include sea level rise and reductions in snowpack, as well as an increased number of extreme-heat days per year, high ozone days, large forest fires, and drought years (CARB, 2009). Globally, climate change could affect numerous environmental resources through potential, though uncertain, changes in future air temperatures and precipitation patterns. According to the International Panel on Climate Change (IPCC), the projected effects of climate change are likely to vary regionally, but are expected to include the following direct effects (IPCC, 2007):

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures (fewer cold days and frost days over nearly all land areas);
- Reduced diurnal temperature range over most land areas;
- Increase in heat index over most land areas; and
- More intense precipitation events.

In addition, many secondary effects are projected to result from climate change, including a global rise in sea level, ocean acidification, impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity. The possible outcomes and feedback mechanisms involved are not fully understood, and much research remains to be done; however, over the long term, the potential exists for substantial environmental, social, and economic consequences. Secondary effects of climate change with the most potential to affect the project area include sea level rise and ocean acidification. For discussion of effects related to climate change-induced sea level rise, refer to the *Coastal Flooding and Sea Level Rise* discussion in Section 4.3.1.4. See below for discussion of climate change-induced ocean acidification.

Ocean Acidification

Atmospheric CO_2 has risen by about 40 percent above pre-industrial levels. The ocean absorbs about a quarter of human-caused emissions of CO_2 annually, which is changing seawater chemistry and decreasing pH, making seawater more acidic. Surface ocean pH has declined by 0.1 units, equivalent to a 30 percent increase in ocean acidity, since pre-industrial times. Ocean acidification will continue in the future due to the interaction of atmospheric CO_2 and ocean water. Regional differences in ocean pH occur as a result of variability in regional or local conditions, such as upwelling that brings subsurface waters up to the surface. Locally, coastal waters and estuaries can also exhibit acidification as the result of pollution and excess nutrient inputs (GCRP, 2014).

More acidic waters disrupt the marine food chain. For example, calcium carbonate is a skeletal component of a wide variety of organisms in the oceans, including corals. The chemical changes caused by the uptake of CO_2 make it more difficult for these living things to form and maintain calcium carbonate shells and skeletal components and increases erosion of coral reefs, resulting in alterations in marine ecosystems that will become more severe as present-day trends in acidification continue or accelerate (GCRP, 2014). It should be noted that ocean acidification has little effect on the operations of desalination plants since the reverse osmosis process is not affected by pH.

4.11.1.2 Greenhouse Gas Emissions

GHG emissions that result from human activities primarily include carbon dioxide (CO_2), with much smaller amounts of nitrous oxide (N_2O), methane (CH_4, often from unburned natural gas), sulfur hexafluoride (SF_6) from high-voltage power equipment, and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. Because these GHGs have different warming potentials (i.e., the amount of heat trapped in the atmosphere by a certain mass of the gas), and CO_2 is the most common reference gas for climate change, GHG emissions are often quantified and reported as CO_2-equivalent (CO_2e) emissions. For example, while SF_6 represents a small fraction of the total annual GHGs emitted worldwide, this gas is very potent, with 22,800 times the global warming potential of CO_2. Therefore, an emission of 1 metric ton of SF_6 would be reported as 22,800 metric tons CO_2e. The global warming potential of CH_4 and N_2O are 25 times and 298 times that of CO_2, respectively (CARB, 2016a). The principal GHGs resulting from human activity that enter and accumulate in the atmosphere are described below.

Carbon Dioxide

CO_2 is a naturally occurring gas that enters the atmosphere through natural as well as anthropogenic (human) sources. Key anthropogenic sources include the burning of fossil fuels (e.g., oil, natural gas, and coal), solid waste, trees, wood products, and other biomass, as well as industrially relevant chemical reactions such as those associated with manufacturing cement. CO_2 is removed from the atmosphere when it is absorbed by plants as part of the biological carbon cycle.

Methane

Like CO_2, CH_4 is emitted from both natural and anthropogenic sources. Key anthropogenic sources of CH_4 include gaseous emissions from landfills, releases associated with mining and materials extraction industries (in particular coal mining), and fugitive releases associated with the extraction and transport of natural gas and crude oil. CH_4 emissions also result from livestock and agricultural practices. Small quantities of CH_4 are released during fossil fuel combustion.

Nitrous Oxide

N_2O is also emitted from both natural and anthropogenic sources. Important anthropogenic sources include industrial activities, agricultural activities (primarily the application of nitrogen fertilizer), the use of explosives, combustion of fossil fuels, and decay of solid waste.

Fluorinated Gases

HFCs, PFCs, and SF_6 are synthetic gases emitted from a variety of industrial processes, and they contribute substantially more to the greenhouse effect on a pound for pound basis than the GHGs described previously. Fluorinated gases are often used as substitutes for ozone-depleting substances (i.e., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases are typically emitted in small quantities, but because of their potency they are sometimes referred to as "high global warming potential gases." Fluorinated gases would not be emitted by any of the proposed construction or operational equipment that would be associated with the proposed project.

4.11.1.3 Greenhouse Gas Sources

Anthropogenic GHG emissions in the United States are derived mostly from the combustion of fossil fuels for transportation and power production. Energy-related CO_2 emissions resulting from fossil fuel exploration and use account for approximately three-quarters of the human-generated GHG emissions in the United States, primarily in the form of CO_2 emissions from burning fossil fuels. More than half of the energy-related emissions come from large stationary sources, such as power plants; approximately one-third derive from transportation; and a majority of the remaining sources include: industrial processes, agriculture, commercial, and residential (USEPA, 2016a).

Statewide emissions of GHG from relevant source categories for 2008 through 2014 are summarized in **Table 4.11-1**. Specific contributions from individual air basins, such as the North Central Coast Air Basin (Air Basin), which encompasses the project area, are included in the emissions inventory but are not itemized by air basin. In 2014, California produced 441.5 million gross metric tons of CO_2e emissions. Transportation was the source of 37 percent of the state's GHG emissions, followed by industrial at 24 percent, electricity generation at 20 percent, commercial and residential sources at 11 percent, and agriculture and forestry comprised the remaining 8 percent (CARB, 2016b). Although not included as an emission inventory category, water use requires significant amounts of energy. Approximately one-fifth of the electricity and one-third of the non-power plant natural gas consumed in the state are associated with water delivery, treatment, and use.

Existing Greenhouse Gas Emissions at the Project Site

No industrial, residential, or other emitters of GHGs currently are located or operating at the MPWSP Desalination Plant site, slant wells site, Carmel Valley Pump Station site, or ASR injection well sites. There are no other existing onsite operations that result in the combustion of fossil fuel, or otherwise result in direct anthropogenic emissions of GHGs at the project sites. There is, however, existing grassland or scrub type vegetation located at these project sites that provide ongoing natural carbon uptake. The natural carbon uptake expressed in CO_2 associated with grassland and scrub vegetation types are 4.3 metric tons and 14.3 metric tons of CO_2 per acre-year, respectively (CAPCOA, 2013). These rates of carbon uptake were calculated by multiplying total biomass (metric tons dry matter per acre) from IPCC data by the carbon fraction in plant material (i.e., 0.47), then using the ratio of molecular weights (44/12) to convert from metric tons of carbon to metric tons of CO_2.

TABLE 4.11-1
CALIFORNIA GHG EMISSIONS (million metric tons CO_2E)

Emission Inventory Category	2008	2009	2010	2011	2012	2013	2014	
Transportation	176.17	169.51	166.20	162.90	162.94	161.46	163.02	37%
Electricity Generation (In State)	54.50	53.51	46.92	41.36	51.18	49.60	51.81	12%
Electricity Generation (Imports)	65.92	48.13	43.67	46.94	44.15	40.24	36.56	8%
Commercial	17.74	18.74	20.20	20.85	21.11	21.64	21.63	5%
Industrial	99.31	97.26	100.88	100.76	101.09	103.76	104.22	24%
Residential	30.55	30.33	31.43	32.25	30.30	31.47	27.40	6%
Agriculture and Forestry	36.37	34.06	34.92	35.85	36.78	35.36	36.11	8%
Not Specified (Solvents & Chemicals)	0.85	0.79	0.82	0.79	0.78	0.79	0.79	0%
Total Gross Emissions	**481.4**	**452.3**	**445.0**	**441.7**	**448.3**	**444.3**	**441.5**	100%

NOTE: The GHG percentages of the total gross emissions for year 2014 were rounded to the nearest whole number.

SOURCE: CARB, 2016b.

4.11.2 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, and regulations relevant to GHGs. A summary of each is provided, along with a finding regarding the proposed project's consistency with those regulatory requirements. The consistency findings concern the proposed project without mitigation. Where the proposed project would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the proposed project would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact discussion in Section 4.11.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is discussed in more detail.

4.11.2.1 Federal Regulations

Clean Air Act

On April 2, 2007, in *Massachusetts v. USEPA* (549 US 497), the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act. The Court held that the USEPA must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making such decisions, the USEPA is required to follow the language of Section 202(a) of the Clean Air Act, which obligates it to prescribe (and from time to time revise) standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines. The Supreme Court decision resulted from a petition for rulemaking under Section 202(a) filed by more than a dozen environmental, renewable energy and other organizations.

On April 17, 2009, the USEPA Administrator signed proposed "endangerment" and "cause or contribute" findings for GHGs under Section 202(a) of the Clean Air Act. The USEPA found that six GHGs, taken in combination, endanger both the public health and the public welfare of current and future generations. The USEPA also found that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the greenhouse effect as air pollution that endangers public health and welfare under Clean Air Act Section 202(a). Pursuant to 40 CFR Part 52, *Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule*, USEPA has mandated that Prevention of Significant Deterioration (PSD) and Title V requirements apply to facilities whose stationary source CO_2e emissions exceed 100,000 tons per year (USEPA, 2016b). The proposed project would not trigger PSD or Title V permitting under this regulation because it would generate less than 100,000 tons of CO_2e emissions per year.

U.S. Supreme Court Decision in Utility Air Regulatory Group v. USEPA

On June 23, 2014, the U.S. Supreme Court held that USEPA may not treat GHG emissions as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits that are otherwise required (based on emissions of other pollutants) may continue to require limitations on GHG emissions based on the application of Best Available Control Technology (BACT). In accordance with the Supreme Court decision, on April 10, 2015, the D.C. Circuit issued an amended judgment in *Coalition for Responsible Regulation, Inc. v. U.S. Environmental Protection Agency*, which vacated the PSD and Title V regulations under review in that case to the extent that they require a stationary source to obtain a PSD or Title V permit solely because the source emits or has the potential to emit GHGs above the applicable major source thresholds. The D.C. Circuit also directed USEPA to consider whether any further revisions to its regulations are appropriate, and if so, to undertake to make such revisions. In response to the Supreme Court decision and the D.C. Circuit's amended judgment, the USEPA intends to conduct future rulemaking action to make appropriate revisions to the PSD and operating permit rules (USEPA, 2016b).

4.11.2.2 State Regulations

A variety of statewide rules and regulations mandate the quantification and, if emissions exceed established thresholds, the reduction of GHGs. CEQA requires Lead Agencies to evaluate project-related GHG emissions and the potential for projects to contribute to climate change and to provide appropriate mitigation in cases where the Lead Agency determines that a project would result in a significant addition of GHGs to the atmosphere.

Executive Order S-3-05

In June 2006, Governor Arnold Schwarzenegger signed Executive Order S-3-05, which established the following statewide emission-reduction targets through the year 2050:

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

This executive order does not contain any requirements that directly pertain to the proposed project; however, future actions taken by the State of California to implement these goals may affect the proposed project, depending on the specific implementation measures that are developed.

Assembly Bill 32

California Assembly Bill (AB) 32, *the Global Warming Solutions Act of 2006*, required the California Air Resources Board (CARB) to establish a statewide GHG emissions cap for 2020 based on 1990 emission levels. AB 32 required CARB to adopt regulations that identify and require selected sectors or categories of emitters of GHGs to report and verify their statewide GHG emissions, and CARB is authorized to enforce compliance with the program. Under AB 32, CARB also was required to adopt a statewide GHG emissions limit equivalent to the statewide GHG emissions levels in 1990, which must be achieved by 2020. CARB established this limit in December 2007 at 427 million metric tons of CO_2e. This is approximately 30 percent below forecasted "business-as-usual" emissions of 596 million metric tons of CO_2e in 2020, and about 10 percent below average annual GHG emissions during the period of 2002 through 2004 (CARB, 2009). In the interest of achieving the maximum technologically feasible and cost-effective GHG emission reductions, AB 32 permits the use of market-based compliance mechanisms and requires CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it adopts.

Climate Change Scoping Plan (AB 32 Scoping Plan)

In December 2008, CARB approved the AB 32 Scoping Plan outlining the State's strategy to achieve the 2020 GHG emissions limit. The Scoping Plan estimates a reduction of 174 million metric tons CO_2e (about 191 million tons) from the transportation, energy, agriculture, forestry, and high climate-change-potential sectors, and proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California's energy sources, save energy, create new jobs, and enhance public health. The Scoping Plan must be updated every five years to evaluate the mix of AB 32 policies to ensure that California is on track to achieve the 2020 GHG reduction goal. Appendices C and E of the adopted 2008 AB 32 Scoping Plan include a list of 39 recommended action measures to reduce GHG emissions (CARB, 2009). Of the action measures, *W-3: Water System Energy Efficiency,* is the only measure that is directly applicable to the proposed project. The purpose of this measure is to reduce the magnitude and intensity of energy use in California's water systems through implementation of energy-efficient production, treatment, and conveyance infrastructure. CARB has set a 20 percent electricity use reduction target from 2006 levels for this measure. The CPUC cannot substantiate that the proposed project's electricity use would be reduced by 20 percent; therefore, the MPWSP would be potentially inconsistent with Measure W-3. This issue is addressed in Impact 4.11-3.

The AB 32 Scoping Plan must be updated every five years to evaluate the adopted mix of AB 32 policies to ensure that California is on track to achieve the 2020 GHG reduction goal. CARB

released its first Scoping Plan Update in May 2014 (CARB, 2014). There are no recommended actions identified in the Scoping Plan Update that are directly applicable to the proposed project.

Mandatory Reporting Requirements

Pursuant to California Code of Regulations Title 17, Sections 95100 through 95158, operations of large industrial stationary combustion and process emissions sources that emit 10,000 metric tons CO_2e or more per calendar year are required to report and verify their GHG emissions to CARB. As indicated in **Table 4.11-5** under Impact 4.11-1, below, the total amortized GHG emissions for the proposed project would be 7,638 metric tons per year, which is below the AB 32 reporting threshold; therefore, the proposed project would not be subject to the AB 32 mandatory reporting requirements. In addition, many of the proposed project's sources of GHG emissions are not directly subject to CARB's reporting program because they are non-stationary sources, or are indirect emissions from electricity generating facilities which separately are subject to this program.

Market-Based "Cap-and-Trade" Compliance Mechanism

AB 32 allows the use of market-based compliance mechanisms to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 also requires CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it adopts. In response, CARB adopted a cap-and-trade program that covers major sources of GHG emissions such as refineries and power plants. The program includes an annual emissions cap that declines over time. CARB's cap-and-trade program applies to facilities that would emit 25,000 metric tons or more of CO_2e per year. Since the total amortized GHG emissions for the proposed project are estimated at 7,638 metric tons per year, the cap-and-trade program would not apply to the proposed project (see Section 4.11.5 for a discussion and breakdown of the construction-related and operational GHG emissions associated with the proposed project). The fossil fuel power plants that would generate the electricity that could be used by the project are already subject to and participate in CARB's cap-and-trade program.

Senate Bill 97

In 2007, the California State Legislature passed SB 97, which required amendment of the CEQA Guidelines to incorporate analysis of, and mitigation for, GHG emissions from projects subject to CEQA. The amendments took effect March 18, 2010. The amendments added Section 15064.4 to the CEQA Guidelines, specifically addressing the potential significance of GHG emissions. Section 15064.4 calls for a "good faith effort" to "describe, calculate or estimate" GHG emissions and indicates that the analysis of the significance of any GHG impacts should include consideration of the extent to which the project would:

- Increase or reduce GHG emissions;
- Exceed a locally applicable threshold of significance; or
- Comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions."

The CEQA Guidelines also state that a project may be found to have a less-than-significant impact related to GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (14 Cal. Code Regs. §15064(h)(3)). Importantly, however, the CEQA Guidelines do not require or recommend a specific analytical methodology or provide quantitative criteria for determining the significance of GHG emissions.

Executive Order B-30-15

In April 2015, Governor Edmund G. Brown Jr. issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. Reaching this emission reduction target will make it possible for California to reach its ultimate goal of reducing emissions 80 percent under 1990 levels by 2050, as identified in Executive Order S-3-05. Executive Order B-30-15 also specifically addresses the need for climate adaptation and directs state government to:

- Incorporate climate change impacts into the State's Five-Year Infrastructure Plan;
- Update the Safeguarding California Plan, the state climate adaption strategy to identify how climate change will affect California infrastructure and industry and what actions the state can take to reduce the risks posed by climate change;
- Factor climate change into state agencies' planning and investment decisions; and
- Implement measures under existing agency and departmental authority to reduce GHG emissions (OGB, 2015).

Executive Order B-30-15 requires CARB to update the AB 32 Climate Change Scoping Plan to incorporate the 2030 target. The 2030 Draft Scoping Plan (Draft Scoping Plan) will serve as the framework to define the State's climate change priorities for the next 15 years and beyond. In June 2016, CARB released the 2030 Target Scoping Plan Update Concept Paper to describe potential policy concepts to achieve the 2030 target that can be incorporated in the Draft Scoping Plan. The concept paper presents four potential high-level concepts for achieving the needed GHG reductions (CARB, 2016c). The MPWSP would be potentially inconsistent with Executive Order B-30-15's GHG emissions goal because it would generate direct and indirect emissions of GHG emissions that could have a significant impact on the environment. This issue is addressed in Impacts 4.11-1 and 4.11-2.

4.11.2.3 Applicable Regional and Local Land Use Plans and Policies

As described above, the AB 32 Scoping Plan outlines the State's overall strategy to achieve the 2020 GHG emissions limit. Although state, regional, and local land use plans, policies, and regulations generally do not address GHG emissions at the project level, numerous state, regional, and local agencies with jurisdiction over the proposed project have adopted plans, policies, and regulations related to air quality and energy consumption that also have the effect of reducing GHG emissions. Project consistency with such plans, policies, and regulations is analyzed in Sections 4.10, Air Quality, and 4.18, Energy Conservation, of this EIR/EIS.

4.11.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to GHG emissions if it would:

- Generate GHG emissions, either directly or indirectly, that could have a significant impact on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

The GHG analysis in this EIR/EIS relies on significance criteria identified by staff of the local air pollution control district, Monterey Bay Unified Air Pollution Control District (MBUAPCD). In February 2014, the MBUAPCD staff recommended that its Board of Directors approve an operational significance threshold of 10,000 metric tons CO_2e per year for stationary source projects that rely on operational processes and equipment that are subject to MBUAPCD permitting requirements. For land use projects, the MBUAPCD staff recommended to its board in February 2014 that it adopt the following options (i.e., if adopted, land use projects would be required to apply one of these options to demonstrate a less-than-significant impact): (a) a "bright line" significance threshold of 2,000 metric tons CO_2e per year; (b) incorporate mitigation measures to reduce all project GHG emissions by 16 percent compared to unmitigated emissions; or (c) or demonstrate compliance with an applicable adopted GHG reduction plan/climate action plan (MBUAPCD, 2014). In February 2016, the MBUAPCD adopted the staff-recommended significance threshold of 10,000 metric tons for stationary source projects (MBUAPCD, 2016a). As of June 2016, the MBUAPCD Board of Directors has not adopted any of the thresholds recommended by its staff for land use projects (MBUAPCD, 2016b). However, for the reasons set forth below, this EIR/EIS nonetheless uses the significance threshold of 2,000 metric tons CO_2e per year to evaluate whether the proposed project's emissions could have a significant impact on the environment.

For land use projects, the MBUAPCD staff-recommended bright line significance threshold is 2,000 metric tons CO_2e per year, which is based on a similar threshold that has been developed for Ventura County and represents an "emissions capture rate" of 75 percent of all commercial and residential land use development projects in Ventura County.[1] This recommended threshold is based on emissions data suggesting that commercial and residential projects that emit greater than 2,000 metric tons CO_2e per year are responsible for 75 percent of GHG emissions associated with those land uses. Therefore, use of this threshold effectively requires mitigation for the top 75 percent of emissions generated by new land use projects. If all land use-project emissions are mitigated to below this threshold, it would represent an overall reduction in new land use project-related emissions of up to 75 percent. Since the issuance of Executive Order B-30-15, the GHG emissions reductions goal of lowering GHG emissions to 40 percent below 1990 levels by 2030, is roughly equivalent to reducing emissions by 44 percent below current levels. This analysis uses

[1] A "75 percent emissions capture rate" means that 75 percent of the total emissions from all new projects would be subject to analysis in an environmental impact report prepared pursuant to CEQA, including analysis of feasible alternatives and imposition of feasible mitigation measures.

the staff-recommended bright line threshold to determine if the proposed project would generally be consistent with this goal.

It is acknowledged that the 2,000 metric ton significance threshold focuses on new commercial and residential development rather than industrial uses; however, similar to the emissions that would be associated with the proposed project, GHG emissions associated with commercial and residential development projects tend to be indirect in nature, primarily as a result of automobile and electricity use. This significance threshold falls short of meeting the Executive Order S-3-05 emissions reduction goal of lowering emissions to 80 percent below 1990 levels by 2050, which is equivalent to lowering emissions to 84 percent below current levels. The MBUAPCD staff and CARB have not yet provided guidance or recommendations for significance thresholds to evaluate consistency with the 2050 emissions reduction goal.[2]

MBUAPCD staff has not identified a specific significance threshold for short-term construction-related GHG emissions. Therefore, GHG emissions from MPWSP construction and periodic slant well maintenance are evaluated based on guidance developed by the San Luis Obispo County Air Pollution Control District (SLOCAPCD). For construction-related GHGs, SLOCAPCD recommends that total emissions from construction be amortized over a period equal to the estimated life of the project (in this case 40 years) and added to operational emissions, and then compared to the operational significance threshold (SLOCAPCD, 2012).

4.11.4 Approach to Analysis

The following discussions provide an overview of the approach to analysis for GHG emissions impacts. The assumptions used to estimate construction and operational GHG emissions are provided in **Appendix G1**.

4.11.4.1 Construction Emissions

Assumptions regarding construction equipment, equipment horsepower (hp) ratings, and construction phasing were developed by the CPUC and the Sanctuary in coordination with CalAm to populate the off-road equipment GHG emissions model used in this analysis. For off-road equipment, emissions were estimated using the California Emissions Estimator Model version 2013.2.2 (CalEEMod v2013.2.2). It is assumed that each piece of equipment associated with construction of the proposed MPWSP Desalination Plant would operate for up to 12 hours per day, the drill rigs for installation of the subsurface slant wells and ASR-5 and ASR-6 Wells would operate for up to 24 hours per day, the other equipment required to construct the slant wells and associated facilities would operate for up to 12 hours per day, and construction

[2] On July 13, 2017, the California Supreme Court issued its opinion, reversing and remanding the 4th District Court of Appeals prior decision, in *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497. There, the Supreme court held that the greenhouse gas analysis in the EIR SANDAG prepared for its SB 375 regional transportation plan was not required to "explicitly engage in an analysis of the consistency of the projected 2050 emissions" with the 80 percent reduction goal called for in Executive Order No. S-3-05, and in dicta, advised lead agencies to ensure that CEQA analysis discloses long-term greenhouse gas emissions, and "stays in step with evolving scientific knowledge and state regulatory schemes."

equipment associated with all other project components (e.g., pipelines, and pump stations) would operate up to 8 hours per day.

GHG emissions from project-related on-road construction vehicles were estimated using CARB's most recent version of its motor vehicle emissions burden model (EMFAC2014). Since the EMFAC2014 model provides GHG emissions factors for CO_2 only, N_2O emission factors for gasoline and diesel combustion were obtained from The Climate Registry (TCR, 2016). GHG emissions in the form of CO_2e were calculated by multiplying the estimated total miles that would be traveled by construction worker vehicles and haul trucks by the GHG emission factors, multiplying the N_2O and CH_4 emissions by their respective global warming potential, and adding the CO_2, N_2O, and CH_4 emissions. Consistent with the SLOCAPCD's recommended approach for construction emissions, this analysis amortizes the proposed project's construction emissions over a 40-year project lifetime and adds them to the proposed project's estimated annual operational emissions, and then compares the total combined emissions to the 2,000 metric tons CO_2e per year significance threshold.

4.11.4.2 Operational Emissions

Indirect Emissions

The existing power demand needed to produce, treat, and convey water supplies for the Monterey District Service area used in this analysis is based on the average annual actual energy used in 2011, 2012, 2013, and 2015, multiplied by the 10-year average (2006 through 2015) of water production. Existing operational power demand is approximately 11,466 megawatt-hours (MWh) per year (CalAm, 2016). This amount represents the baseline electrical demand for this analysis.

The indirect emissions associated with the proposed project's electricity use were estimated using Pacific Gas and Electric Company's (PG&E) power grid emission factor for year 2020 [i.e., 290 pounds CO_2 per MWh; PG&E, 2015], which would be the first year the project would be operational. N_2O and CH_4 emission factors for electricity use were obtained from TCR (2016). CalAm initially estimated that the proposed project's annual electricity demand would be approximately 63,164 MWh per year (CalAm, 2016); and subsequent adjustments in the project description increased this estimate to 63,364 MWh per year. Therefore, the net increase in electrical power demand as of 2020 would be approximately 51,898 MWh per year. GHG emissions were estimated for CO_2, N_2O, and CH_4, the total CO_2e associated with project power demand was calculated by multiplying the N_2O and CH_4 emissions by their respective global warming potential, and then those values were added to the CO_2 emissions.

Exhaust Emissions

GHG emissions would also be generated from project-related vehicle travel during project operations and maintenance, from emergency generator testing at the MPWSP Desalination Plant, Monterey Pump Station, and Carmel Valley Pump Station, and off-road equipment use associated with periodic maintenance of the subsurface slant wells. GHG emissions from vehicles that would be used during project operations and maintenance were estimated using the same methodology described above for construction-related vehicle emissions. Emissions associated with up to

30 commuting workers each day and up to 3 material deliveries per day were calculated using EMFAC2014 emissions factors for light-duty trucks and heavy-duty diesel trucks, and multiplied by the respective estimated long-term vehicle miles per year for each vehicle type.

Routine operation of the emergency generators would be limited to 50 hours per year per generator for testing and maintenance. Fuel consumption factors for the emergency generators were obtained from manufacturer specifications of standby diesel generator sets similar to the size of the proposed emergency generators. GHG emissions associated with emergency generator testing were estimated by multiplying the total diesel fuel estimated to be consumed by CO_2, N_2O, and CH_4 emission factors obtained from TCR (TCR, 2016). N_2O and CH_4 emission values were multiplied by their respective global warming potentials and added to the CO_2 emissions to obtain CO_2e emissions.

For off-road equipment associated with maintenance of the slant wells that would be required every five years, GHG emissions were estimated using CalEEMod v2013.2.2. It was assumed that this maintenance would require four pieces of heavy-duty off-road equipment operating between six and eight hours per day in the CEMEX active mining area for periods ranging from 12 weeks to 18 weeks. Because this maintenance work would occur every five years, this analysis amortizes the slant well maintenance emissions over the five-year maintenance interval for comparison to the 2,000 metric ton significance threshold.

Brine Degassing Emissions

CO_2 degassing from groundwater to the atmosphere has been identified by a member of the public as a potential GHG emissions issue associated with the proposed project. Groundwater CO_2 partial pressures are typically 10 to 100 times higher than atmospheric CO_2 partial pressures. Therefore, when groundwater is extracted and brought to the surface, CO_2 degassing from the groundwater to the atmosphere occurs. To determine the amount of CO_2 degassing from subsurface water extraction that occurs when the groundwater equilibrates with the atmosphere, geochemical speciation modeling of the water would be required (Macpherson, 2009).

The GHG emissions analysis in this EIR/EIS includes consideration of the CO_2 that would be released from the discharged brine. The source water would be extracted from below the ocean floor using subsurface slant wells and conveyed to the desalination plant in an enclosed pipe. Therefore, the source water would behave like extracted groundwater, and degassing would occur when it would be brought to the surface if not treated. Approximately 43 percent of the water would pass through the seawater reverse osmosis system and become drinking water. The drinking water would be treated with lime to elevate the pH such that no CO_2 would be released. The remaining 57 percent would be discharged to the brine storage basin where it would temporarily be stored and have the opportunity to come to equilibrium with the atmosphere thereby releasing CO_2. To calculate the amount of CO_2 that could be released from source water during operation of the proposed project, Trussell Technologies (2016) used data from water quality samples drawn from the test slant well in June 2016 (see Appendix G2). The State Water Resources Control Board and the Central Coast Regional Water Quality Control Board have peer reviewed Trussell Technologies' analysis and the results of the Trussell Technologies analysis is included in this EIR/EIS.

Carbon Sequestration

The rate of existing carbon sequestration that occurs at the proposed project sites that would be permanently disturbed has been estimated under the assumption that the ongoing natural carbon uptake by vegetation and biological soil crusts associated with the general vegetation types of grassland and scrub are equivalent to 4.3 metric tons and 14.3 metric tons of CO_2 per acre, respectively (see Section 4.11.1.3, Greenhouse Gas Sources). The acreages of vegetation types that would be permanently disturbed by the proposed project or one of the action alternatives were obtained from Section 4.6, Terrestrial Biological Resources.

4.11.4.3 Evaluation of GHG Emissions

The proposed project would include three new emergency backup generators that would be operated intermittently. With the exception of these backup generators that would emit less than one half of one percent of the total annual project-related GHG emissions (see Table 4.11-4), the proposed project would include no other stationary sources of emissions that would require a MBUAPCD permit. Although the proposed project would be a heavy industrial land use type, it would primarily result in indirect emissions associated with use of electricity from PG&E's electrical grid by stationary sources at power plants. These sources are regulated and permitted by local air districts throughout California; however, they are outside of the control of CalAm and are not under the jurisdiction of the CPUC. Because the sources of the indirect emissions are already regulated and permitted by the local air districts where the power plants reside, no permit or other MBUAPCD approval would be required for the proposed project's demand for electricity. For this reason, the stationary source threshold of 10,000 metric tons CO_2e per year is not an appropriate threshold to gauge impact significance for the proposed project; use of one of the threshold options developed for land use projects, which do not require MBUAPCD permits for stationary sources, is more appropriate. While the 10,000 metric tons CO_2e per year significance threshold is not used, indirect emissions associated with electricity consumption are calculated and impacts are fully assessed in this chapter.

As mentioned above and elaborated in the discussion of Impact 4.11-1, below, the vast majority of GHG emissions associated with the proposed project would be indirect emissions related to the project's use of electricity from PG&E's electrical power grid. The estimated future average annual energy use for the proposed project is based on aggregate energy use factors for the existing and proposed production facilities and the volume of desalinated product water that would be produced from each. The energy requirements for desalination depend on several factors, including source water, RO membrane properties, and pre- and post-treatment requirements. However, based on the information currently available for the proposed project, it is not possible to quantify with reasonable certainty whether or not the proposed project emissions can be reduced by 16 percent (even with implementation of mitigation discussed in the analysis, below), as recommended by MBUAPCD staff as one of the options to demonstrate a less-than-significant impact, as described above in Section 4.11.3. In addition, there is no existing local or regional GHG reduction plan/climate action plan that would be applicable to the proposed project, such that compliance with an applicable adopted GHG reduction plan/climate action plan could be demonstrated for this project. Therefore, neither the mitigated 16-percent reduction in GHG emissions nor the compliance

with an GHG reduction plan/climate action plan thresholds for assessment of land use projects are considered practicable for evaluation of the proposed project.

4.11.5 Direct and Indirect Effects of the Proposed Project

Table 4.11-2 summarizes the proposed project's GHG-related impacts and significance determinations.

TABLE 4.11-2
SUMMARY OF IMPACTS – GHG EMISSIONS

Impacts	Significance Determinations
Impact 4.11-1: Incremental contribution to climate change from GHG emissions associated with the proposed project.	LSM
Impact 4.11-2: Conflict with the Executive Order B-30-15 Emissions Reduction Goal.	LSM
Impact 4.11-3: Conflict with AB 32 Climate Change Scoping Plan.	LSM
Impact 4.11-C: Cumulative impacts related to greenhouse gas emissions	LSM

NOTE:
LSM = Less than Significant with implementation of mitigation.

Impact 4.11-1: Incremental contribution to climate change from GHG emissions associated with the proposed project. (*Less than Significant with implementation of mitigation*)

Implementation of the proposed project would result in short-term construction and long-term operational emissions. Construction and operation emissions that would be associated with the proposed project are discussed separately below; however, the impact conclusion is based on the sum of amortized construction emissions and the operational emissions (see Section 4.11.4, Approach to Analysis, for additional information regarding the methods used to estimate the proposed project's short-term construction and long-term operation emissions). In the Draft EIR/EIS, Impact 4.11-1 was deemed Significant and Unavoidable due to the lack of available information to quantify the reductions from the proposed mitigation measures. Since publication, the project proponent has committed to a detailed GHG emissions reduction plan that enables quantification of GHG reductions with sufficient certainty. This determination, due to the adoption of the revised mitigation measures described below, has been changed to less than significant with implementation of mitigation. This change reflects a decrease in anticipated impacts, adopts measures previously discussed in the Draft EIR/EIS, and reflects a commitment to mitigation measures in response to comments received during the public comment period.

Construction Emissions

As shown in **Table 4.11-3**, GHG emissions generated by construction of the proposed project would total approximately 14,291 metric tons CO_2e over the 24-month construction period, which equates to a 40-year amortized annual average value of approximately 357 metric tons CO_2e

(refer to Section 4.11.4.1, Construction Emissions, for details on the approach this analysis uses relative to short-term construction emissions; and **Appendix G1** for all assumptions associated with the GHG construction emissions).

TABLE 4.11-3
TOTAL GHG EMISSIONS FROM PROJECT CONSTRUCTION

Construction Emission Source	CO_2e
Desalination Plant	7,087.22
Subsurface Slant Wells	1,880.56
Source Water Pipeline	575.17
Brine Discharge Pipeline	198.02
Brine Mixing Box	594.06
Castroville Pipeline	271.09
Pipeline to CSIP	189.61
New Desalinated Water Pipeline	571.10
New Transmission Main	873.98
ASR Pipelines	472.24
ASR-5 and ASR-6 Wells	866.65
Carmel Valley Pump Station	249.65
Ryan Ranch-Bishop Interconnection Improvements	264.03
Main System-Hidden Hills Interconnection Improvements	198.02
Total Emissions	**14,291.41**
40-Year Amortized Annual Average	**357.29**

SOURCE: ESA, 2017. See **Appendix G1.**

Operational Emissions

The proposed project would generate long-term GHG emissions associated with electrical power consumption, vehicle travel, operation of diesel-fueled emergency generators, and off-road equipment use associated with periodic maintenance at the slant well sites. As described in Section 4.11.4.2, indirect emissions would result from a total project-related net increase in electricity demand of approximately 51,898 MWh per year. Other emission sources that would occur during operations of the proposed project would include up to 66 one-way vehicle trips per day associated with commuting workers and material deliveries, up to 50 hours per year of routine testing and maintenance of each of the two emergency generators at the MPWSP Desalination Plant site (1,000 hp) and at the Carmel Valley Pump Station (68 hp), off-road equipment that would be required every five years to maintain the slant wells, CO_2 degassing from discharged brine water, and loss of carbon sequestration due to permanent vegetation removal. The estimated annual emissions that would be associated with each of these operational sources are presented in **Table 4.11-4**. As indicated in the table, total net CO_2e emissions associated with operation of the proposed project would be approximately 8,008 metric tons per year.

TABLE 4.11-4
TOTAL GHG EMISSIONS FROM PROJECT OPERATIONS

Operation Emissions Source	Operational Emissions (total metric tons)			
	CO_2	N_2O	CH_4	CO_2e
Baseline Electricity Consumption	1,508.27	0.03	0.16	1,521.11
Electricity Consumption with Project	8,308.83	0.16	0.89	8,406.07
Net Increase in Electricity Consumption	6,800.56	0.13	0.73	6,884.96
Vehicle Trips	233.58	0.02	0.01	239.66
Emergency Generator Testing	24.86	<0.01	<0.01	25.09
Off-road Equipment for Slant Well Maintenance (amortized over 5 years)	14.81	<0.01	<0.01	14.86
Degassing from Discharged Brine Water*	735.00	---	---	735.00
Loss of Carbon Sequestration	107.98	---	---	107.98
Total	**7,916.79**	**0.15**	**0.74**	**8,007.54**

SOURCES: ESA, 2017. See **Appendix G1** and Trussell, 2016, **Appendix G2**.

As listed in **Table 4.11-4**, the vast majority of GHG emissions associated with long-term operation of the proposed project would be indirect emissions from the project's use of electricity, which would be provided by the local PG&E electrical power grid.

Due to California's Renewables Portfolio Standard (RPS) program that requires investor-owned utilities to increase procurement from eligible renewable energy sources to 33 percent of total procurement by 2020, PG&E has steadily increased the amount of renewables in its energy production portfolio, which lowers the overall indirect emissions associated with use of its electricity. The mix of sources of electricity that PG&E delivered to its customers in 2015 is described in Section 4.18.1.2 and Table 4.18-1. In fact, indirect emissions associated with use of PG&E's electricity will continue to drop as more and more electricity from renewable power generators is brought onto the grid. PG&E estimates that its emissions rate for its current (i.e., year 2016) energy production portfolio is 370 pounds of CO_2 per MWh generated, and that its emissions rate estimate for year 2020 is 290 pounds of CO_2 per MWh generated (PG&E, 2015). This will equal a reduction in indirect GHG emissions associated with electricity use in the PG&E service area of approximately 22 percent over the next four years. In addition, in October 2015, Governor Brown signed Senate Bill 350 which expanded the RPS program goal to 50 percent by 2030. As a result of this expansion, PG&E's electricity emissions rate (and thus the carbon footprint of the proposed project's electricity consumption) will continue to decrease throughout the life of the proposed project.

Consistency with Regulatory Requirements

As noted in Section 4.11.2, Regulatory Framework, the MPWSP would be potentially inconsistent with Executive Order B-30-15's GHG emissions goal because it would generate direct and indirect emissions of GHG emissions that could have a significant impact on the environment. As discussed

in the following paragraphs of Impact 4.11-1 conclusions and under Impact 4.11-2, **Mitigation Measures 4.18-1 (Construction Equipment and Vehicle Efficiency Plan)** and **4.11-1 (GHG Emissions Reduction Plan)** would reduce the carbon footprint of the proposed project and the impact associated with GHG emissions would be reduced to less than significant.

Impact Conclusion

As shown in **Table 4.11-5**, the sum of the 40-year amortized construction GHG emissions and the total net operation emissions that would be associated with the proposed project is approximately 8,365 metric tons CO_2e per year. These emissions would exceed the 2,000 metric tons per year significance threshold; therefore, a significant impact would occur, and the proposed project would be considered to contribute to the primary and secondary adverse effects of climate change, such as increases in global temperatures, global rise in sea level, ocean acidification, impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity. Of these adverse effects, global rise in sea level would have the most potential to impact the project. See Impact 4.3-11, *Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise*, in Section 4.3.5.2, for a discussion of how global rise in sea level would affect the project.

TABLE 4.11-5
TOTAL AMORTIZED GHG EMISSIONS

Emissions Source	CO_2e (metric tons per year)
40-Year Amortized Construction Emissions	357
Total Net Operational Emissions	8,008
Total Project Emissions	**8,365**

SOURCE: ESA, 2017. See **Appendix G1**.

Implementation of **Mitigation Measure 4.18-1 (Construction Equipment and Vehicle Efficiency Plan)** would ensure that construction activities are conducted in a fuel-efficient manner (see Impact 4.18-1 in Section 4.18, Energy Conservation), which would also limit the generation of GHG construction-related emissions.

With regard to operation-related GHG emissions, the vast majority of emissions would be a result of increased electricity consumption. The MPWSP Desalination Plant is being designed with state of the art energy recovery and energy efficient features; however, additional energy-reducing features may be available to further reduce the electrical consumption associated with the proposed project. In addition, it would be feasible for CalAm to obtain "clean" renewable energy for operations of the proposed project, which would reduce the overall carbon footprint of the project. Therefore, implementation of **Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan)** is required to reduce the overall carbon footprint of the proposed project.

Implementation of **Mitigation Measures 4.11-1** and **4.18-1** would ensure that the proposed project is constructed and operated in an energy-efficient manner and that the overall carbon footprint of the proposed project would be reduced to less than 2,000 metric tons CO_2e per year. The mitigated

amortized project emissions would be approximately 1,480 metric tons CO_2e per year, representing the total unmitigated amortized GHG emissions of 8,365 metric tons CO_2e per year minus the mitigated net GHG increase related to annual electricity consumption of 6,885 metric tons CO_2e per year. Therefore, this impact would be mitigated to a less-than-significant level.[3]

CARB's cap-and-trade program applies to facilities that would emit 25,000 metric tons or more of CO_2e per year. As discussed above, the proposed project would primarily result in indirect emissions associated with electricity use from PG&E's power grid that would be substantially less than 25,000 metric tons CO_2e per year. MBUAPCD considers operations of any project that would be in accordance with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions [such as, sources subject to the Cap-and-Trade requirements pursuant to Title 17, Article 5 (California Cap on Greenhouse Gas Emissions and Market-based Compliance Mechanisms)] to be less than significant. The fossil fuel power plants that would generate the electricity that would be used by the project are already subject to and participate in CARB's cap-and-trade program. \

Mitigation Measures

Since the publication of the Draft EIR/EIS, the project proponent, CalAm, has committed to an updated *GHG Emissions Reductions Plan.*

Mitigation Measure 4.11-1 applies to the project as a whole.

Mitigation Measure 4.11-1: GHG Emissions Reductions Plan.

(a) ***Energy Conservation Technologies*.** CalAm shall have a qualified professional (a licensed mechanical engineer or other appropriately certified professional approved by the CPUC) prepare and submit a GHG Emissions Reduction Plan (Plan) to the CPUC for approval prior to the start of project construction activities. Once approved by the CPUC, the Plan shall be implemented. The Plan shall include a detailed description of the carbon footprint for all operational components of the approved project (e.g., slant well pumping, the MPWSP Desalination Plant, transmission of source and product water, ASR system) based on manufacturer energy usage specification data for each piece of equipment and the most current power system emissions factor for GHG emissions based on the energy portfolio of PG&E, the applicable Electric Service Provider under Direct Access service, or Monterey Bay Community Power and its successors and assigns, as applicable.

The Plan shall include a summary of state-of-the-art energy recovery and conservation technologies available for utility scale desalination facilities and shall include a commitment by CalAm to incorporate available feasible energy recovery and conservation technologies; or, if CalAm finds that any of the technologies will not be feasible for the project, the Plan shall clearly explain why such technology is considered to be infeasible. The carbon footprint estimate for the project shall include consideration of all proposed energy recovery and conservation technologies that will

[3] At the time of publication of the Draft EIR/EIS, it was not possible to substantiate numerically that the GHG emissions would be reduced to less than significant level. Since publication, a detailed mitigation strategy was developed that enabled quantification of reductions with sufficient certainty to support the determination of less than significant with mitigation.

be employed by the project, and shall describe the approximate GHG emissions reductions that will be associated with each technology.

(b) ***Renewable Energy.*** CalAm shall ensure that the approved project's operational electricity use results in net zero GHG emissions. In meeting this net zero GHG emissions requirement, subject to the procedures below, CalAm shall adhere to the following loading order:

(1) Obtain renewable energy from on-site solar photovoltaic (PV) panels and/or the adjacent Monterey Regional Waste Management District (MRWMD) landfill-gas-to-energy (LFGTE) facility.

(2) Procure renewable energy from off-site sources within California via purchases from one or more of the following: (a) PG&E, (b) an Electric Service Provider under Direct Access service, or (c) Monterey Bay Community Power and its successors and assigns.

(3) Procure and retire Renewable Energy Certificates (also known as RECs, green tags, Renewable Energy Credits, Renewable Electricity Certificates, or Tradable Renewable Certificates) for projects or activities in California.

(4) Procure and retire Carbon Offsets, in a quantity equal to the GHG emissions attributable to the project's operational electricity use. "Carbon Offset" means an instrument issued by an Approved Registry and shall represent the past reduction or sequestration of one metric ton of CO_2e achieved by any GHG emission reduction project or activity within California. "Approved Registry" means: (i) the Climate Action Reserve, the American Carbon Registry, the Verified Carbon Standard, or the Clean Development Mechanism; or (ii) any other entity approved by the California Air Resources Board to act as an "offset project registry" under the state's Cap-and-Trade Program.

CalAm may meet this net zero GHG emissions requirement via any of the options, or their future equivalents, or any combination of options, or their future equivalents, included in the aforementioned loading order.

Further, CalAm shall progress through the loading order on the basis of the options' physical and economic feasibility, as reasonably determined by CalAm, with low-cost options preferred over high-cost options. In the event that options have equivalent costs, options enumerated earlier in the loading order shall be selected by CalAm over options enumerated later in the loading order. On or before June 1 of each year the approved project is in operation, CalAm shall submit documentation to the CPUC demonstrating that the project's operational electricity use in the immediately preceding calendar year resulted in net zero GHG emissions. Calculation of the GHG emissions attributable to the project's operational electricity use (if any) shall be calculated by CalAm on an annual basis using the most up-to-date emissions coefficient for purchased electricity (if any), as compiled or published by PG&E, the applicable Electric Service Provider under Direct Access service, or Monterey Bay Community Power and its successors and assigns, as applicable. If the CPUC determines that CalAm failed to achieve net zero GHG emissions for the approved project's operational electricity use for a particular year, then the CPUC shall notify CalAm in writing of the exceedance within 45 days of receipt of the

documentation submitted by CalAm under this mitigation measure. The notice shall specify the metric tons of GHG emissions that exceeded the net zero obligation. Within 45 days of receipt of this notice, CalAm shall procure and retire Carbon Offsets in an amount at least equivalent to the exceedance, and will submit documentation to the CPUC demonstrating this procurement and retirement.

Secondary Impacts of Mitigation Measure 4.11-1:

Potential secondary impacts associated with implementation of solar PV panels as proposed by Mitigation Measure 4.11-1 are discussed below.

- ***Aesthetics/Glare*:** The solar PV panels would potentially be installed on the rooftop or as parking space cover in the parking lot of the MPWSP Desalination Plant, and would therefore share the same aesthetic setting as described for the Desalination Plant in Section 4.14.2.3. This site is characterized as Urban/Built Up, with agriculture, industrial operations, and local roads in the vicinity. The aesthetic visual quality is low. Due to the height of the PV panel installation, passersby may infrequently experience glare from the panels or panel frames at further distances, for fleeting moments at certain times of the year. The impact would be less than significant.
- ***Surface water runoff*:** Since solar PV panels would be installed on the rooftop or parking lot of the MPWSP Desalination Plant, they would displace impervious surfaces already examined in Section 4.3, Surface Water and Hydrology, in Impacts 4.3-7 and 4.3-8 for the Desalination Plant facility, including the parking lot. Overall, the Desalination Plant facility siting would have a less-than-significant impact related to surface water runoff which could cause the alteration of drainage patterns; solar PV panels would not increase this impact.

Mitigation Measure 4.18-1 applies to all project components.

Mitigation Measure 4.18-1: Construction Equipment and Vehicle Efficiency Plan.

(See Impact 4.18-1 in Section 4.18, Energy Conservation, for description.)

Impact 4.11-2: Conflict with the Executive Order B-30-15 Emissions Reduction Goal. (*Less than Significant with implementation of Mitigation*)

All Proposed Project Facilities

As discussed under Impact 4.11-1, above, GHG emissions associated with the proposed project would exceed the emissions significance threshold, which indicates that implementation of the project would not be consistent with the GHG emission reduction goals for year 2030 identified in Executive Order B-30-15. Therefore, the proposed project would conflict with Executive Order B-30-15 and would result in a potentially significant impact.

Implementation of **Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan)** described under Impact 4.11-1, above, and **Mitigation Measure 4.18-1 (Construction Equipment Efficiency Plan)** described under Impact 4.18-1 (see Section 4.18, Energy Conservation), respectively, would require CalAm to develop and implement a GHG Emissions Reduction Plan

and a Construction Equipment Efficiency Plan, which would reduce project-related GHG emissions to below the GHG significance threshold. Therefore, this impact is considered to be less than significant with implementation of mitigation.

Mitigation Measures

Mitigation Measure 4.11-1 applies to the project as a whole.

> **Mitigation Measure 4.11-1: GHG Emissions Reduction Plan.**
>
> (See Impact 4.11-1, above, for description.)

Mitigation Measure 4.18-1 applies to all project components.

> **Mitigation Measure 4.18-1: Construction Equipment Efficiency Plan.**
>
> (See Impact 4.18-1 in Section 4.18, Energy Conservation, for description.)

Impact 4.11-3: Conflict with AB 32 Climate Change Scoping Plan. (*Less than Significant with implementation of mitigation*)

As identified in Section 4.11.2, Regulatory Framework, the only plan that would be directly applicable to the proposed project would be AB 32 Scoping Plan Measure W-3, Water System Energy Efficiency. CARB has set a 20 percent electricity use reduction target from 2006 levels for this measure. The intent of Measure W-3 is to compel water purveyors to: incorporate advanced technologies in the design and construction of water supply systems to lower energy consumption; examine opportunities to use energy sources that have lower GHG emissions; and identify new and innovative technologies and measures for mutually achieving energy and water efficiency savings. As described in Chapter 3, Description of the Project (Proposed Action), Section 3.2.2.2, Reverse Osmosis System, CalAm proposes to incorporate process and energy recovery systems that would utilize pressure-exchange technologies to transfer energy from the high-pressure brine stream to the source water stream to reduce energy demand as well as source water pumping requirements. The use of modern reverse osmosis technology would also ensure that the energy would be used efficiently. These recent technological advancements include less energy intensive membrane materials and more efficient pumps (Pacific Institute, 2013). In addition, the design and construction of the MPWSP Desalination Plant would incorporate various energy efficient design elements into building support systems, electrical and treatment equipment, and process design that would reduce operational energy demand (see Section 3.4.5 in Chapter 3, Description of the Proposed Project). These project elements would increase energy efficiency and reduce energy demand, thereby reducing indirect emissions of GHGs.

In addition to the proposed energy recovery system and use of energy efficient design elements, variable-frequency drives would be used where appropriate to reduce the operating speed of pumps to closely match the pump discharge pressure requirements, which would reduce energy usage (CDM Smith, 2014). Variable-frequency drives, which are electronic controllers that adjust the speed of an electric motor by modulating the power being delivered, provide continuous

control, matching motor speed to the specific demands of the work being performed (CPUC, 2016). In addition, energy-efficient motors, also called premium or high-efficiency motors, would be used for project motors ranging in size from 5 to 800 hp. These motors are up to 8 percent more efficient than standard motors. Energy-efficient motors contain design improvements including, for example, lengthening the core and using lower-electrical-loss steel, thinner stator laminations, more copper in the windings to reduce electrical losses, improved bearings, and smaller, more aerodynamic cooling fans (CPUC, 2016). Also, the pipeline system materials and sizing that would be used for the proposed project would be designed to limit pressure losses and reduce pumping and energy demand requirements (CDM Smith, 2014).

Impact Conclusion

CARB has set a 20 percent electricity use reduction target for Measure W-3. The MPWSP Desalination Plant designs already include state of the art energy recovery and energy efficient features in place of standard energy saving systems; although there may be additional feasible energy reducing features available to further reduce the electrical consumption associated with the project. Therefore, implementation of **Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan)** is required to ensure that the proposed project is operated in an energy-efficient manner to the extent feasible. Although the CPUC cannot substantiate that the proposed project's electricity use would be reduced by 20 percent, pursuant to implementation of Mitigation Measure 4.11-1, the electricity that would supply the project would be generated from renewable energy sources, and/or would otherwise be offset through the procurement of Renewable Energy Certificates and/or retirement of Carbon Offsets. Therefore, this impact is considered to be less than significant with implementation of mitigation.

Mitigation Measure

Mitigation Measure 4.11-1 applies to the project as a whole.

> **Mitigation Measure 4.11-1: GHG Emissions Reduction Plan.**
>
> (See Impact 4.11-1, above, for description.)

4.11.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.11-C: Cumulative impacts related to greenhouse gas emissions (*Less than Significant with implementation of mitigation*)

Because GHG emissions have global climate change implications, the evaluation of GHG emissions impacts is inherently a cumulative impact analysis. Through Executive Orders S-3-05 and B-30-15, as well as AB 32, the State has established goals and policies for reducing its contribution of GHG emissions. Accordingly, these policy documents provide goals against which

the significance of individual projects' emissions can be measured. Consistent with the emissions reduction goal for 2030 identified in Executive Order B-30-15, the numeric significance criterion used to evaluate operational emissions plus construction emissions amortized over the project's estimated 40-year lifetime is 2,000 metric tons CO_2e per year. The analysis also considers the MPWSP's consistency with applicable AB 32 Scoping Plan Measure W-3. If MPWSP construction and operations would result in GHG emissions greater than 2,000 metric tons CO_2e per year, or conflict with AB 32 Scoping Plan Measures, the MPWSP would not be considered consistent with the State's GHG reduction goals and the associated impact would be cumulatively significant. The timeframe during which the MPWSP could contribute to cumulative GHG emissions effects includes the 24-month construction phase, as well as the anticipated approximately 40-year operations phase.

As discussed in Impact 4.11-1, the MPWSP construction activities would generate approximately 14,291 metric tons CO_2e over the 24-month construction period. Amortized over the project's estimated 40-year lifetime, annual average emissions would be approximately 357 metric tons CO_2e (refer to **Appendix G1** for all assumptions associated with the GHG construction emissions). The Impact 4.11-1 discussion also discloses that the MPWSP operations total net emissions would be approximately 8,008 metric tons CO_2e per year, which would result in a significant impact and a significant contribution to the overall significant cumulative impact associated with climate change. Thus, the combined amortized annual construction emissions and annual operations emissions would be approximately 8,365 metric tons CO_2e. **Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan)** requires CalAm to prepare and implement a GHG Emissions Reduction Plan to address project emissions. The plan would identify specific technologies CalAm would implement to maximize energy efficiency and use of renewable energy technologies, and would be subject to CPUC review prior to the start of construction. In addition, CalAm would be required to implement **Mitigation Measure 4.18-1 (Construction Equipment Efficiency Plan)** to ensure project construction activities are conducted in a fuel-efficient manner, which would also limit the generation of GHG construction-related emissions.

Implementation of these measures would reduce the overall carbon footprint of the project to a less-than-significant level. Therefore, with mitigation, the project's incremental contribution to the cumulative climate change impact related to GHG emissions would be less than significant.

The intent of AB 32 Scoping Plan Measure W-3 (Water System Energy Efficiency) is to encourage GHG emissions reductions through the incorporation of energy saving technologies. As described in the Impact 4.11-3 discussion, CalAm has committed to implementing project features to ensure that the MPWSP would be operated in an energy efficient manner; although there may be additional feasible energy-reducing features available to further reduce the electrical consumption associated with the project. Therefore, implementation of Mitigation Measure 4.11-1 (GHG Emissions Reduction Plan) is required to ensure that the proposed project is operated in an energy-efficient manner to the extent feasible. CARB has set a 20 percent electricity use reduction target for Measure W-3. Although the CPUC cannot substantiate that the proposed project's electricity use would be reduced by 20 percent, pursuant to implementation of Mitigation Measure 4.11-1, the electricity that would supply the project would be generated from renewable energy sources, and/or would otherwise be offset through the procurement of Renewable Energy Certificates and/or

retirement of Carbon Offsets. Therefore, the project's incremental contribution to the cumulative impact related to conflicts with the AB 32 Climate Change Scoping Plan would be less than significant with implementation of mitigation.

References – Greenhouse Gas Emissions

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