4.14. Greenhouse Gas Emissions and Climate Change

This section identifies the regulatory setting and existing conditions related to greenhouse gases (GHGs), and discusses the Project's potential to result in impacts associated with the emission of GHGs. It also discusses the Project's potential to expose property and persons to the physical effects of climate change, including but not limited to flooding, public health risk, wildfire risk, or other impacts resulting from climate change.

The Project, which would be constructed in three phases, has four main elements that could result in GHG impacts: 1) a wastewater treatment facility, 2) pump stations, 3) wastewater collection and recycled water distribution system pipelines, and 4) percolation ponds and groundwater injection wells. For the purposes of this section, "Project area" refers to the area that encompasses the extent of the four main elements described above and the area that would be served by these proposed Project facilities. "Project site" refers specifically to those areas that would be disturbed by construction activities associated with these four main elements. The Project would include a Local Coastal Program Amendment and modification of zoning for the wastewater treatment facility to include an Institutional District Overlay.

4.14.1. Environmental Setting

Regulatory Setting

Federal Regulations

Although climate change and GHG emissions reduction are concerns at the federal level, no regulation or legislation has been enacted to address issues related to these concerns at the project level. However, climate change and its associated effects are being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean Car Program" and Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance.

Executive Order 13514. This executive order focuses on reducing GHGs internally in federal agency missions, programs, and operations, but it also directs federal agencies to participate in the interagency Climate Change Adaptation Task Force, which is engaged in developing a U.S. strategy for adaptation to climate change.

State Regulations

With the passage of several pieces of legislation, including state senate and assembly bills and executive orders, California launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level.

Assembly Bill 1493. This bill requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light-truck GHGs. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009 model year. In June 2009, the U.S. EPA Administrator granted a Clean Air Act waiver of preemption to California. This waiver allowed California to implement its own GHG emission standards for motor vehicles beginning with model year 2009. California agencies are currently working with federal

agencies to conduct joint rulemaking to reduce GHG emissions from passenger cars in model years 2017 to 2025.

Executive Order S-3-05. The goal of this executive order is to reduce California's GHG emissions to 1) 2000 levels by 2010, 2) 1990 levels by 2020, and 3) 80 percent below the 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

Executive Order S-01-07. Governor Schwarzenegger set forth the low-carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least ten percent by 2020.

Senate Bill 97. This legislation required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the State CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Assembly Bill 32 (AB 32, or the Global Warming Solutions Act of 2006). The Global Warming Solutions Act of 2006 sets the same overall GHG emissions reduction goals outlined in Executive Order S-3-05 while further mandating CARB to create a plan that includes market mechanisms and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases."

County Regulations

On November 18, 2008, the Los Angeles County Board of Supervisors adopted three ordinances that together make up the County's Green Building Program: the Green Building ordinance (County Code, Chapter 22.52, Part 20), the Drought-Tolerant Landscaping ordinance (County Code, Chapter 22.52, Part 21), and the Low Impact Development Standards (LID) ordinance (County Code, Chapter 22.52, Part 22).

Local Regulations

The City of Malibu has identified sustainability policies within its General Plan Conservation Element. The specific policies that relate to energy conservation, water conservation, and solid waste reduction would all have a GHG emissions reduction co-benefit. The General Plan, adopted in November 1995, serves as the major tool for directing growth while maintaining an attractive, viable, safe, and sustainable environment. It outlines a vision for the City and establishes policies to achieve the objectives. Applicable policies included in the Conservation Element of the City of Malibu General Plan are presented below.

Energy Conservation

CON OBJECTIVE 3.1: Use of innovative, energy-efficient techniques and systems.

- CON Policy 3.1.1: The City shall educate the community regarding the importance of and techniques for energy conservation.
- CON Policy 3.1.2: The City shall encourage state-of-the-art energy efficiency standards for all new construction design.
- CON Policy 3.1.3: The City shall protect solar access.
- CON Policy 3.1.4: The City shall encourage uses of solar and other nonpolluting, renewable energy sources.

The transition to renewable energy resources such as wind and solar, and the implementation of energy-efficiency measures, can reduce GHG emissions considerably.

Water Conservation

CON OBJECTIVE 4.1: Ten percent reduction in the amount of water for residential and commercial uses by 2001 and a three-day emergency water supply in all residential areas.

- CON Policy 4.1.3: The City shall encourage water conservation design measures in residential, commercial, and industrial development.
- CON Policy 4.1.4: The City shall promote the use of water-efficient low-flow fixtures.
- CON Policy 4.1.5: The City shall encourage the use of drought-resistant landscaping.
- CON Policy 4.1.6: The City shall promote the use of reclaimed water that has had pathogens removed for appropriate uses such as landscape irrigation systems.
- CON Policy 4.1.7: The City shall promote the use of greywater systems.

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. GHG emissions can be reduced considerably by more efficient transport, treatment, and use of water.

Solid Waste Reduction

CON OBJECTIVE 5.1: Fifty percent reduction in the amount of solid waste generated by the community and disposed of in landfills by 2000.

- CON Policy 5.1.1: The City shall reduce solid waste.
- CON Policy 5.1.2: The City shall encourage recycling.
- CON Policy 5.1.3: The City shall encourage co-composting.

Methane emissions from landfills, generated when wastes decompose, account for about one percent of California's GHG emissions. By maximizing solid waste diversion from landfills, methane emissions can be reduced considerably.

~~**City of Malibu Local Energy Efficiency Standards**~~

~~In addition to the City's General Plan, the City of Malibu has also adopted standards that require all new nonresidential construction to exceed the 2008 California Building Energy Efficiency Standards' operational energy standards by no less than 15 percent (Malibu Municipal Code Section 15.18).[1]~~

Existing Conditions

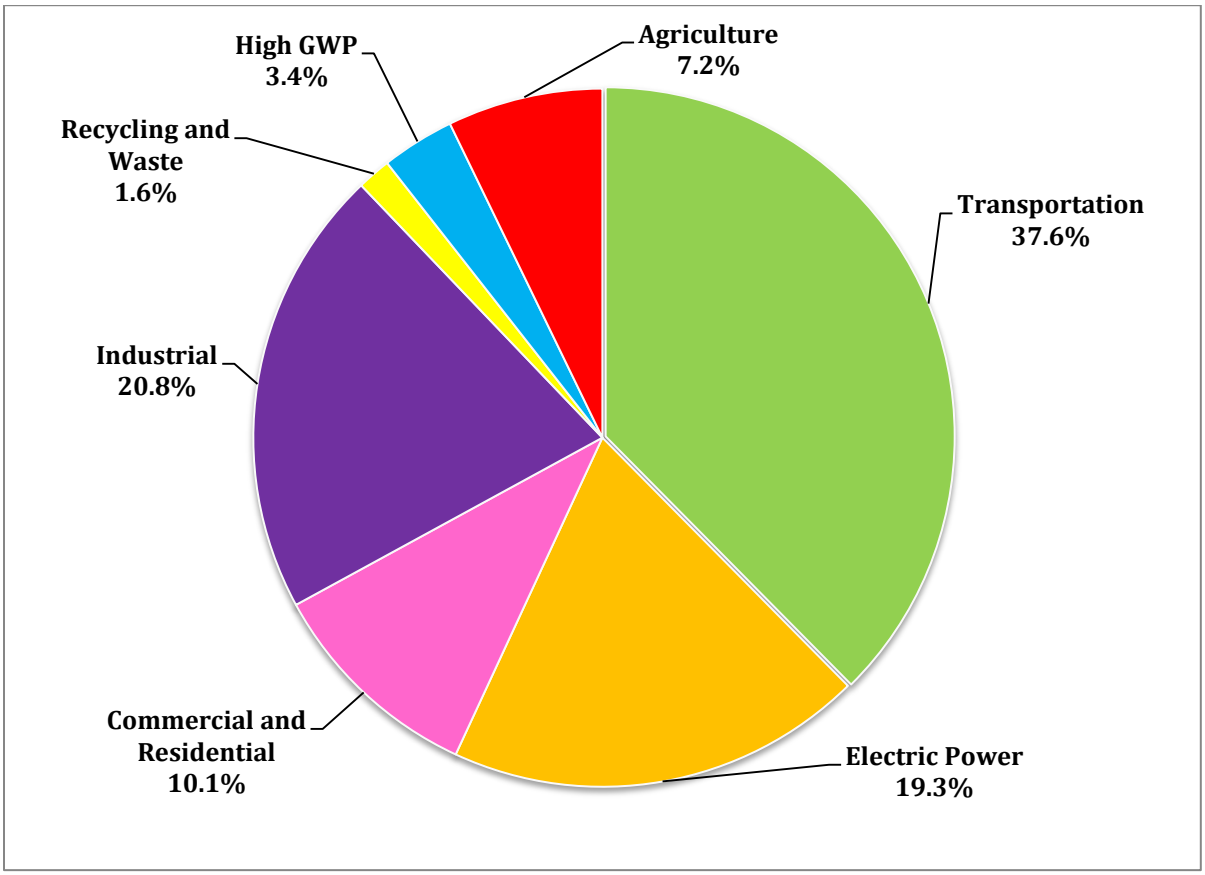
State GHG Emissions

As shown in Figure 4.14-1, transportation is responsible for 38 percent of the state's GHG emissions, followed by the industrial sector (21 percent), electricity generation (19 percent), agriculture and

[1] The local energy efficiency standards are no longer in effect due to the implementation of the 2013 Title 24 California Building Energy Efficiency Standards.

forestry (7 percent), and other sources (15 percent) (California Air Resources Board 2013). Emissions of carbon dioxide and nitrous oxide are byproducts of fossil fuel combustion as well as other sources. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills, among other sources. Sinks of carbon dioxide include uptake by vegetation and dissolution into the ocean.[2] California GHG emissions in 2011 totaled 448 million metric tons (MT) of carbon dioxide equivalent (CO_2e).[3]

Figure 4.14-1. GHG Emissions by Sector, 2011



Source: California Air Resources Board, 2013.

[2] A carbon sink is a natural or artificial reservoir that accumulates and stores some carbon-containing chemical compound for an indefinite period. The process by which carbon sinks remove carbon dioxide from the atmosphere is known as carbon sequestration.

[3] GHG emissions other than carbon dioxide are commonly converted into carbon dioxide equivalents, which take into account the differing global warming potential (GWP) of different gases. For example, the Intergovernmental Panel on Climate Change finds that nitrous oxide has a GWP of 310 and methane has a GWP of 21. Thus, the emission of 1 ton of nitrous oxide and 1 ton of methane is represented as the emission of 310 tons of CO_2e and 21 tons of CO_2e, respectively. This allows for the summation of different GHG emissions into a single total.

Climate change could affect the natural environment in California in the following ways:

- Rising sea levels along the California coastline, particularly in San Francisco and the San Joaquin Delta, due to ocean expansion;
- Extreme heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent;
- An increase in the number of heat-related human deaths, infectious diseases, and respiratory problems caused by deteriorating air quality;
- Reduced snow pack and streamflow in the Sierra Nevada, affecting winter recreation and water supplies;
- Potential increase in the severity of winter storms, affecting peak streamflows and flooding;
- Changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield; and
- Changes in the distribution of plant and wildlife species due to changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems are occurring at a time when California's population is expected to increase from 34 million to 59 million by 2040.[4] As such, the number of people potentially affected by climate change as well as the amount of man-made GHG emissions expected under a "business as usual" scenario is expected to increase. Changes similar to those noted above for California would also occur in other parts of the world, with regional variations in resources affected and vulnerability to adverse effects. GHG emissions in California are attributable to human activities associated with the industrial/manufacturing, utilities, transportation, residential, and agricultural sectors as well as natural processes.[5]

4.14.2. Environmental Impact Analysis

Section 15064.4 of the State CEQA Guidelines establishes a two-step process for determining the significance of GHG emissions. First, it requires lead agencies to calculate or estimate the overall magnitude of a project's GHG emissions. Second, once the magnitude of emissions has been estimated, lead agencies must analyze those emissions using applicable factors (i.e., does the project increase or decrease emissions?, do project emissions exceed an applicable threshold?, does the project comply with applicable regulations or an applicable plan?).

Project-related GHG emissions were estimated using the CalEEMod and Road Construction Emission Model software programs, which calculate carbon dioxide, methane, and nitrous oxide emissions and present all emissions in terms of CO_2e.

Following the methodology prescribed by the Southern California Air Quality Management District (SCAQMD) CEQA Significance Threshold Working Group, calculated Project emissions included direct and indirect emissions during short-term construction and long-term Project operations. Construction emissions were amortized over the life of the Project, defined as 30 years, and added to the operational emissions to obtain total annual GHG emissions.

[4] California Energy Commission. 2006. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004.* December. Available: <http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF>.
[5] Ibid.

Thresholds of Significance

The CEQA Guidelines do not state what amount of GHG emissions would constitute a significant impact on the environment. Instead, they leave the determination of the significance of GHG emissions up to the lead agency and authorize the lead agency to consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence. (CEQA Guidelines Sections 15064.4(a) and 15064.7(c)).

Although the CEQA Guidelines are silent on whether CEQA evaluations should address the potential impacts of climate change on a project, CEQA Guidelines Section 15126.2 (a) does note that the lead agency should "evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions." With this, a lead agency should consider whether construction and operation of a proposed project would be affected by climate change. In conducting such an evaluation, the agency should focus on the long-term impacts of the project that are more likely to experience the effects of climate change in the future.

For the purposes of this EIR and in accordance with Appendix G and Section 15126.2(a) of the State CEQA Guidelines, the proposed Project would result in a significant impact if would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment;
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs; or
- Expose property and persons to the physical effects of climate change, including but not limited to flooding, public health, wildfire risk, or other impacts resulting from climate change.

The State CEQA Guidelines do not provide numeric or qualitative thresholds of significance for GHG emissions. However, AB 32 requires GHGs emitted in California to be reduced to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. *The Technical Advisory on CEQA and Climate Change* from OPR suggests that, in absence of regulatory guidance or standards, lead agencies, such as the City of Malibu, may rely on significance criteria established by the applicable air quality management district.

Although SCAQMD has not adopted quantitative GHG emissions thresholds for non-SCAQMD lead agency projects,[6] in its *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules, and Plans* documentation, SCAQMD suggests that a screening-level threshold of 3,000 MT per year of CO_2e emissions is appropriate for commercial projects. Although the proposed Project is not technically a commercial project, the suggested screening-level thresholds for all other land use types are higher than 3,000 MT of CO_2e per year. As such, the significance criterion of 3,000 MT of CO_2e per year was used for this analysis.

[6] At this time, the SCAQMD interim GHG significance threshold of 10,000 MT of CO_2e only applies to stationary source/industrial projects where SCAQMD is the lead agency under CEQA. These projects would include: AQMD rules, rule amendments, and plans, e.g., Air Quality Management Plans. In addition, AQMD may be the lead agency under CEQA for projects that require discretionary approvals, i.e., projects that require discretionary air quality permits from the AQMD. In other words, if AQMD is not the lead agency under CEQA, the 10,000 MT of CO_2e threshold does not apply.

Impacts

Impact GHG-1: Would the Project Generate GHG Emissions, either Directly or Indirectly, that May Have a Significant Impact on the Environment?

Construction of the proposed Project would generate GHG emissions through on-site use of heavy-duty construction equipment and off-site vehicle trips made by construction workers as well as haul/delivery trucks that would travel to and from the Project site. Mobile-source emissions would result from the use of construction equipment, including, but not limited to, graders, scrapers, bulldozers, wheeled loaders, and cranes. Construction of the proposed Project would be completed in phases, with each of the three phases taking 18 months to complete.

Operation of the proposed Project is expected to result in GHG emissions related to the treatment, aeration, and pumping of wastewater and recycled water. In addition, there would be approximately 23 vehicle trips per week during full buildout operation for regular staffing, waste disposal, and inspections, with more vehicle trips occurring for weekly, monthly, and annual maintenance services. Area-source GHG emissions from the influent pump station, headworks, and equalization basin would be captured and filtered through an organic media bed, which would remove volatile organic compounds. As such, these emissions would be negligible. Once the ~~CCWTF~~ treatment facility begins accepting wastewater and OWDSs are decommissioned, pumping of OWDSs would no longer be required, partially offsetting the increase in GHG emissions anticipated. In addition, the use of locally treated wastewater for irrigation instead of imported water is likely to reduce GHG emissions associated with the production and conveyance of imported water.

For the purpose of determining whether or not GHG emissions from a proposed Project are significant, direct and indirect emissions from short-term construction activity and long-term operations activity are quantified. Construction emissions are amortized over the life of the project, defined as 30 years, and added to the operation-period emissions, per SCAQMD guidance (SCAQMD 2008). As shown in Table 4.14-1, the proposed Project's annual GHG emissions are estimated to be 1,132 MT of CO_2e. These estimates reflect emissions from all construction and operation activities. As noted earlier, statewide CO_2e emissions for 2011 were estimated to be 448.11 *million* MT. Additionally, the proposed Project's annual GHG emissions are less than the SCAQMD's proposed threshold of 3,000 MTons for commercial projects as a measure of significance. As a consequence, the impact of the proposed Project's GHG emissions~~,~~ would be less than significant.

Table 4.14-1. Estimate of Project-Related GHG Emissions

Project Emissions Sources	Annual CO_2e Emissions (MT)
Construction Emissions (30-year amortization)	64
Operations Emissions – Energy Use	903
Operations Emissions – Aerobic Process	123
Operations Emissions – Mobile Source	42
Project Emissions Annual Total	1,132
Significance Threshold	3,000
Exceed Threshold?	No
Note: CalEEMod output sheets provided in Appendix B.	
Source: ICF International, 2013.	

Impact GHG-2: Would the Project Conflict with an Applicable Plan, Policy, or Regulation Adopted for the Purpose of Reducing the Emissions of GHGs?

AB 32 identified a 2020 target level for GHG emissions in California of 427 million MT of CO_2e. To achieve this GHG reduction target, there will have to be widespread reductions in GHG emissions across California. Some of these reductions will need to come in the form of changes in vehicle emissions and mileage standards, changes in the sources of electricity, and increases in energy efficiency by existing facilities. The remainder will need to come from requiring new facility development to have a lower carbon intensity than "business as usual" conditions. Therefore, this analysis uses a threshold of significance that is in conformance with the state's goals.

On December 12, 2008, CARB adopted the AB 32 Scoping Plan, which details GHG emissions reduction measures that target specific GHG sources. Although none of the scoping plan measures are applicable to the proposed Project, nevertheless, Project-related GHG emissions would be reduced as a result of several AB 32 Scoping Plan measures. The scoping plan considers a range of actions that include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms (e.g., a cap-and-trade system). Some examples include the following:

- Mobile-source GHG emissions reduction measures:
  - Pavley emissions standards (19.8 percent reduction)
  - Low-carbon fuel standard (7.2 percent reduction)
  - Vehicle efficiency measures (2.8 percent reduction)
- Energy production–related GHG emissions reduction measures:
  - Natural gas transmission and distribution efficiency measures (7.4 percent reduction)
  - Natural gas extraction efficiency measures (1.6 percent reduction)
  - Renewables (electricity) portfolio standard (33.0 percent reduction)

These reductions in mobile-source and energy-production GHG emissions would occur in addition to the City-specific sustainability goals identified in the City of Malibu General Plan, which would have a GHG emissions reduction co-benefit.

In summary, the proposed Project would not frustrate any AB 32 Scoping Plan measures, nor be inconsistent in any way with the AB 32 goal of reducing state-wide GHG emissions. In addition, the proposed Project would further City of Malibu conservation policies, which have the co-benefit of reducing GHG emissions. As such, the proposed Project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

Impact GHG-3: Would the Project Expose Property and Persons to the Physical Effects of Climate Change, Including but Not Limited to Flooding, Public Health, Wildfire Risk, or Other Impacts Resulting from Climate Change?

The proposed Project would be subject to climate change impacts resulting from past, present, and future GHG emissions regardless of the success of local, state, national, or international efforts in reducing future GHG emissions; this is because of the existing concentrations of GHG emissions in the atmosphere and the inevitable additional emissions that will be generated before GHG reductions plans are effective.

As mentioned earlier, potential climate change impacts in California include, but are not limited to, sea level rise, extreme heat events, increased energy consumption, increase in infectious diseases and respiratory illnesses, reduced snowpack and water supplies, increased water consumption, and potential increase in wildfires. The climate change impact of greatest concern to the proposed Project is the potential for sea level rise. Sea level rise estimates from the National Research Council (NRC) 2012 report entitled *Sea Level Rise for the Coasts of California, Oregon and Washington: Past, Present and Future* were used to evaluate the potential impacts of sea level rise on the City of Malibu. This analysis is detailed in Appendix I.

According to the analysis presented in Appendix I, sea level rise may have significant impacts on the shoreline infrastructure of the City of Malibu. However, in all cases examined using the NRC's sea level rise projections, the CCWTF facility would be located outside the zone of influence as are related pipelines, pump stations and tanks in upland areas. Related Project infrastructure located close to the shoreline, Malibu Lagoon and south of Pacific Coast Highway, including subsurface pipelines and pump stations and the injection wells and associated facilities, would be at potential risk of impacts from sea level rise. To mitigate these impacts, the City would implement an adaptive management approach to addressing sea level rise for all its infrastructure (including, but not limited to, that which will be in place as a result of the ~~CCWTF~~ proposed ~~p~~Project) and would utilize a planned retreat approach to managing anticipated impacts on its future injection well system, including identification of additional possible injection locations within the Civic Center area (Figure 4.14-2). Groundwater elevations ~~will~~ would be monitored before and during Project implementation as part of permit requirements. In addition, Malibu Creek and Lagoon stage (elevation) data would continue to be monitored as part of existing programs. These data would provide the City with the information necessary to determine if Project infrastructure, or any other City infrastructure, may be at risk from sea level rise and/or if infrastructure performance is at risk. These periodic analyses of data will provide the City with the tools and methods necessary for making adaptive management decisions. As such, the proposed Project would not result in a significant exposure of property or persons to the potential effects of climate change. This impact is considered to be less than significant.

4.14.3. Mitigation Measures

No mitigation measures are necessary.

4.14.4. Unavoidable Significant Adverse Impacts

There would be no unavoidable significant adverse impacts related to GHGs that would occur as a result of Project construction and operation.

4.14.5. Cumulative Impacts

As discussed above under Impact GHG-2, the Project would not frustrate any of the California AB 32 Scoping Plan measures that were developed to reduce state-wide GHG emissions. Additionally, the Project would be developed consistent with City of Malibu General Plan Conservation Element goals related to energy conservation, water conservation, and solid waste reduction that have the co-benefit of reducing GHG emissions.

Given the Project's consistency with State GHG emission reduction goals and objectives, the contribution to the cumulative impact of global climate change would be less than significant and would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

Figure 4.14-2. Possible Well Retreat Locations