

16 CLIMATE CHANGE

16.1 INTRODUCTION

This chapter provides information relevant to climate change impacts under NEPA and CEQA in connection with the proposed action and alternatives. This chapter includes an introduction, environmental and regulatory setting, impact analysis methods and assumptions, significance criteria, environmental effects of the action and alternatives, and mitigation measures to address effects that are identified as significant. Criteria air pollutants (e.g. ozone, carbon monoxide [CO], particulate matter [PM₁₀], and PM_{2.5}) are addressed in Chapter 15, *Air Quality*, of this document.

16.2 DATA SOURCES

Key sources of information used to prepare this Climate Change chapter include the following:

- ▲ *Yolo County 2030 Countywide General Plan* (Yolo County 2009a),
- ▲ *Yolo County 2030 Countywide General Plan Draft Environmental Impact Report* (Yolo County 2009b),
- ▲ *Yolo County Climate Action Plan* (Yolo County 2011),
- ▲ *City of Davis General Plan* (City of Davis 2007),
- ▲ *City of Davis Climate Action and Adaption Plan* (City of Davis 2010),
- ▲ *City of West Sacramento General Plan 2035 Policy Document* (City of West Sacramento 2016),
- ▲ *City of West Sacramento Draft Climate Action Plan* (City of West Sacramento 2010),
- ▲ *City of Winters General Plan* (City of Winters 1994),
- ▲ *City of Woodland General Plan* (City of Woodland 2017),
- ▲ *City of Woodland 2035 Climate Action Plan* (City of Woodland 2017), and
- ▲ *Yolo-Solano Air Quality Management District (YSAQMD) Handbook for Assessing and Mitigating Air Quality Effects* (YSAQMD 2007).

16.2.1 Definitions

Brief definitions of terminology used in this analysis are listed below.

Global climate change is the observed long-term increase in the temperature of Earth's atmosphere, as well as, shifts in the Earth's average climate (e.g. precipitation, occurrence of storms). In the past 100 years (1906 to 2005), global surface temperatures have risen by 1.3 °F ± 0.32 °F (0.74 °C ± 0.18 °C) (IPCC 2014). While natural climatic shifts are common in Earth's history, scientific consensus concludes that recent global climate change is caused in large part by anthropogenic (man-made) emissions of greenhouse gases (GHGs) released into the atmosphere through the combustion of fossil fuels and by other activities that affect the global GHG budget (e.g. deforestation and land-use change) (IPCC 2014).

Greenhouse gases (GHGs) that are widely seen as the principal contributors to human-induced global climate change are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Human activities in the past 100 years have caused substantial quantities of these GHGs to be released into the atmosphere, thereby enhancing the natural greenhouse gas effect. These gases can vary drastically in terms of their global warming potential (GWP).

Global warming potential (GWP) is defined as the relative measure of how much heat a GHG traps in the atmosphere. GWP is measured over a specific time interval that represents the lifetime of a GHG in the atmosphere (e.g., 20, 50, 200 years). The Intergovernmental Panel on Climate Change (IPCC) defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalent (CO₂e), which compares the gas in question to that of the same mass of CO₂ (CO₂ has a GWP of one by definition). A high GWP therefore represents high infrared absorption and long atmospheric lifetime when compared to CO₂.

Carbon dioxide (CO₂) is the most abundant GHG. Natural sources include respiration (breathing), volcanic outgassing, decomposition of organic matter, and evaporation from the oceans. Anthropogenic sources include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. In 2013, CO₂ emissions accounted for approximately 84 percent of California's overall GHG emissions, with the majority of emission originating from the transportation sector (ARB 2015). CO₂ has a GWP of one.

Methane (CH₄) is a potent GHG. Natural sources include wetlands, termites, and oceans. Anthropogenic sources include rice cultivation, livestock, landfills and waste treatment, biomass burning, and fossil fuel combustion. In 2013, CH₄ emissions accounted for approximately nine percent of gross GHG emissions in California (ARB 2015). CH₄ has a GWP of 28.

Nitrous Oxide (N₂O) is a very potent GHG. It is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Human activities emit N₂O during fuel combustion, with the quantity emitted varying according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. In 2013, N₂O emissions accounted for approximately three percent of man-made GHG emissions in California (ARB 2015). N₂O has a GWP of 265.

Hydrofluorocarbons (HFCs) are primarily used as substitutes for ozone-depleting substances. PFCs and sulfur hexafluoride (SF₆) are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. In 2013, HFCs, PFCs, and SF₆ emissions accounted for approximately four percent of man-made GHG emissions in California (ARB 2015). GWPs of HFCs range from four to 23,500, with SF₆ having the highest GWP.

16.3 AFFECTED ENVIRONMENT

16.3.1 Environmental Setting

The primary effect of global climate change has been a rise in average global temperatures. Global climate modeling shows that further warming could induce the following additional climate effects:

- ▲ rises in sea levels along coastlines due to ocean expansion;
- ▲ changes in extreme-heat conditions, such as heat waves and very high temperatures;
- ▲ increases in wildfire frequency and intensity;
- ▲ increases in heat-related human deaths, infectious diseases, and risk of respiratory problems caused by deteriorating air quality;

- ▲ increased percentages of winter precipitation as rain rather than snow;
- ▲ decreases in snow pack and stream flow, affecting winter recreation and water supplies;
- ▲ increases in the severity of winter storms, affecting peak stream flows and flooding;
- ▲ changes in growing season conditions that could affect agriculture, causing variations in crop quality and yield;
- ▲ changes in the distribution of plant and wildlife species; and
- ▲ changes in precipitation levels, including increasing precipitation in some areas of the world and decreasing precipitation in others.

Cal-Adapt is a climate change scenario planning tool developed by the California Energy Commission (CEC) that downscales global climate model data to local and regional resolution under two emissions scenarios: the A-2 scenario represents a business-as-usual future emissions scenario, and the B-1 scenario represents a lower GHG emissions future. According to Cal-Adapt, annual average temperatures in the Plan area are projected to rise by 3.8-6.5 °F by 2100, with the range based on low and high emissions scenarios (Cal-Adapt 2014).

GREENHOUSE GAS EMISSIONS INVENTORIES

A GHG inventory is a quantification of all GHG emissions sources and sinks (i.e., mechanisms that absorb GHGs from the atmosphere and fix it in another form, such as trees removing CO₂ and using it to form wood) within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (i.e., for global and national entities) or on a small scale (i.e., for a particular building or person). Table 16-2 details the results of multiple inventories applicable to all, or portions of the Plan Area.

Table 16-1 Summary of Global, Federal, State, Yolo County, and Local GHG Emissions Inventories¹

GHG Inventory	Total Emissions	% of 2004 Global Emissions
2004 Global Emissions Inventory	27 billion metric tons	N/A
2013 National Emissions Inventory	6.7 billion metric tons	24.8.0%
2013 Statewide Emissions Inventory	459.3 million metric tons	1.7%
2008 Unincorporated Yolo County Emissions Inventory	651,470 metric tons	0.000024%
2006 City of Davis Emissions Inventory	309,367 metric tons	0.000011%
2007 City of West Sacramento Emissions Inventory	410,682 metric tons	0.000015%
2005 City of Woodland Emissions Inventory	544,000 metric tons	0.000020%
1990 City of Winters Emissions Inventory	42,800 metric tons	0.0000016%

Source: EPA 2013, ARB 2013, Yolo County 2011, City of Davis 2008, City of West Sacramento 2010, City of Woodland 2014

A baseline GHG inventory was prepared for Yolo County as part of a Climate Action Plan (CAP) prepared in 2011 (Yolo County 2011). The CAP estimates that in 2008, the unincorporated area produced 651,470 metric tons of GHGs. Approximately 48 percent of those emissions were generated by agriculture while transportation and energy account for an additional 47 percent. In 2006, County staff conducted an inventory of municipal government operations and reported that these operations generated approximately 12 percent of total GHGs (Yolo County 2011). Energy use, including electricity and natural gas, comprised 22 percent of total GHG emissions (Yolo County 2009b).

In 2008, the City of Davis reported that community-wide emissions totaled 309,367 metric tons for the year 2006 (City of Davis 2008). The City of West Sacramento's Draft Climate Action Plan reported that community-wide GHG emissions in 2007 were 410,682 metric tons (City of West Sacramento 2010). In 2008, the City of West Sacramento reported that municipal operations generated 18,000 metric tons of GHGs. The City of Woodland's preliminary 2020 CAP reported that community-wide GHG emissions in 2005 were 544,000 metric tons (City of Woodland 2014). At the time of writing this Draft EIR/EIS, the City of Winters has not completed a CAP; however, Winters completed a GHG inventory which estimates that Winters GHG emissions in 2005 were approximately 59,100 metric tons (City of Winters 2012).

16.3.2 Regulatory Setting

Climate change is widely recognized as a threat to the global climate, economy, and population. Covering actions by multiple jurisdiction and agencies, the climate change regulatory setting—nationally, statewide, and locally—is complex and continues to evolve. The following section identifies key legislation and executive orders relevant to the environmental assessment of project GHG emissions. The courts have, and continue to play a key role in the interpretation and implementation of climate change regulations; therefore, key court cases are also referenced.

FEDERAL LAWS AND REGULATIONS

George W. Bush's Climate Change Policy Plan

In February 2002, the United States government announced a comprehensive strategy to reduce the GHG intensity of the American economy by 18 percent over the 10-year period from 2002 to 2012. This strategy had three basic components: (1) slowing the growth of emissions, (2) strengthening science, technology and institutions, and (3) enhancing international cooperation. To accomplish these goals, the government created the Climate Change Science Program (CCSP) and Climate Change Technology Program (CCTP) to investigate natural and human-induced changes to the global climate, as well as accelerate the development of technologies capable of reducing GHG emissions.

Massachusetts v. Environmental Protection Agency

On April 2, 2007, the United States Supreme Court ruled that the U.S. Environmental Protection Agency (EPA) has the authority to regulate CO₂ emissions under the federal CAA. Two years later, in December 2009, the EPA Administrator found that current and projected concentrations of CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ threaten the public health and welfare of current and future generations. Additionally, the Administrator found that combined emissions of CO₂, CH₄, N₂O, and HFCs from motor vehicles contribute to the atmospheric concentrations and thus to the threat of climate change. Although the Endangerment Finding in itself does not place requirements on industry, it is an important step in the EPA's process to develop regulation of GHGs.

While no specific GHG thresholds have been published by the federal government, the following regulations have been adopted and represent milestones in the development of a threshold:

EPA Mandatory GHG Reporting

Under this rule, suppliers of fossil fuels or industrial GHGs (e.g., PFCs), manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHGs are required to report annual emissions to the EPA.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 (EISA) requires an increase in the Corporate Average Fuel Economy (CAFE) vehicle gas mileage standard to 35 miles per gallon for the combined fleet of cars and

light trucks by model year 2020. The act also includes several other provisions for renewable energy and energy efficiency.

Updated CAFE Standard

On May 19, 2009 President Obama issued a requirement to automakers to increase fuel efficiency of the combined fleet of cars manufactured in the United States to 35.5 mpg by 2016, four years ahead of the schedule set by the EISA. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25 percent.

STATE LAWS AND REGULATIONS

Executive Order S-3-05

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea level. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

As described below, legislation was passed in 2006 (Assembly Bill [AB] 32) to limit GHG emissions to 1990 levels by 2020 with continued "reductions in emissions" beyond 2020, but no specific additional reductions were enumerated in the legislation. Further, Senate Bill (SB) 375 (sustainable community strategies/transportation) established goals for emissions from light duty truck and automobiles for 2020 and 2035.

A recent California Appellate Court decision, *Cleveland National Forest Foundation v. San Diego Association of Governments* (November 24, 2014), further examined the executive order and whether it should be viewed as having the equivalent force of a legislative mandate for specific emissions reductions. The case has been accepted for review by the California Supreme Court, and therefore is not currently considered a precedent. Thus, as executive orders cannot establish policy without legislative support, the State does not currently have a mandated GHG reduction target for 2030 or 2050. It should be noted, however, that language contained in AB 32 (see below) sets the trajectory for the State to continue reductions of GHGs past 2020.

AB 32, the Global Warming Solutions Act of 2006

In September 2006, Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006 (AB 32). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also requires that these reductions "...shall remain in effect unless otherwise amended or repealed. (b) It is the intent of the Legislature that the statewide GHG limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020. (c) The (Air Resources Board) shall make recommendations to the Governor and the Legislature on how to continue reductions of GHG emissions beyond 2020." [California Health and Safety Code, Division 25.5, Part 3, Section 38551]

The AB 32 Scoping Plan

In December 2008, the California Air Resources Board (ARB) adopted its Climate Change Scoping Plan, which contains the main strategies California will implement to achieve reduction of approximately 118 million metric tons (MMT) of CO₂e (CO₂e is further explained below in Section 15.1.2) emissions, or approximately 21.7 percent from the State's projected 2020 emission level of 545 MMT of CO₂e under a business-as-usual scenario (this is a reduction of 47 MMT CO₂e, or almost 10 percent, from 2008 emissions). ARB's original 2020 projection was 596 MMT CO₂e, but the current 545 MMT CO₂e 2020 projection takes into account the economic downturn that occurred in 2008 and associated reductions in statewide GHG emissions (ARB 2011).

The Scoping Plan reapproved by ARB in August 2011 includes the Final Supplement to the Scoping Plan Functional Equivalent Document, which further examined various alternatives to Scoping Plan measures. The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of the State's GHG inventory. ARB estimates the largest reductions in GHG emissions to be achieved by 2020 will be by implementing the following measures and standards (ARB 2011):

- ▲ improved emissions standards for light-duty vehicles (estimated reductions of 26.1 MMT CO₂e);
- ▲ the Low-Carbon Fuel Standard (15.0 MMT CO₂e);
- ▲ energy efficiency measures in buildings and appliances (11.9 MMT CO₂e); and
- ▲ a renewable portfolio and electricity standards for electricity production (23.4 MMT CO₂e), and the Cap-and-Trade Regulation for certain types of stationary emission sources (e.g., power plants).

In May 2014, ARB released, and has since adopted, the *First Update to the Climate Change Scoping Plan* to identify the next steps in reaching AB 32 goals and evaluate the progress that has been made between 2000 and 2012 (ARB 2014). According to the update, California is on track to meet the near-term 2020 GHG limit and is well positioned to maintain and continue reductions beyond 2020 (ARB 2014). The update also reports the trends in GHG emissions from various emission sectors.

The update summarizes sector-specific actions needed to stay on the path toward the Executive Order S-3-05 2050 target. While the update acknowledges certain reduction targets by others (such as in the Copenhagen Accord), it stops short of recommending a specific target for California, instead acknowledging that mid-term targets need to be set “consistent with the level of reduction needed [by 2050] in the developed world to stabilize warming at 2°C (3.6°F) [above pre-industrial levels].”

Actions are recommended for the energy sector, transportation (clean cars, expanded zero-emission vehicle program, fuels policies, etc.), land use (compliance with regional sustainability planning targets), agriculture, water use (more stringent efficiency and conservation standards, runoff capture, etc.), waste (elimination of organic material disposal, expanded recycling, use of Cap and Trade program, etc.), green building (strengthen Green Building Standards), and other sectors. Many of the actions that result in meeting targets will need to be driven by new or modified regulations.

Executive Order B-30-15

On April 20, 2015 Governor Edmund G. Brown Jr. signed Executive Order B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. California is on track to meet or exceed the current target of reducing GHG emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (Assembly Bill 32, discussed above). California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050.

SB 32 and AB 197, Statutes of 2016

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize ARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the State's continuing efforts to pursue the long-term target expressed in EOs S-3-05 and B-30-15 of 80 percent below 1990 emissions levels by 2050.

SB 32 is contingent upon AB 197, which grants the State Legislature stronger oversight over ARB's implementation of its GHG reduction programs. AB 197 amended the existing Health and Safety Code sections and established new statutory directions, including the following provisions. Section 9147.10 establishes a six-member Joint Legislative Committee on Climate Change Policies to ascertain facts and

make recommendations to the Legislature. ARB is required to appear before this committee annually to present information on GHG emissions, criteria pollutants, and toxic air contaminants from sectors covered by the Scoping Plan. Section 38562.5 requires that ARB consider social cost when adopting rules and regulations to achieve emissions reductions, and prioritize reductions at large stationary sources and from mobile sources. Section 38562.7 requires that each Scoping Plan update identify the range of projected GHG and air pollution reductions and the cost-effectiveness of each emissions reduction measure.

SB 375 (Steinberg), Statutes of 2008

SB 375, signed into law by Governor Schwarzenegger in 2008, requires regional transportation plans, developed by metropolitan planning organizations (MPOs), to incorporate a “sustainable communities strategy (SCS)” in their regional transportation plans (RTPs) that will achieve GHG emission reduction targets set by ARB.

The Sacramento Area Council of Governments (SACOG) serves as the MPO for Sacramento, Placer, El Dorado, Yuba, Sutter, and Yolo counties, excluding those lands located in the Lake Tahoe Basin. The Plan Area is located within Yolo County and includes the cities of Davis, West Sacramento, Winters, and Woodland. SACOG adopted its Metropolitan Transportation Plan (MTP)/SCS 2035 in 2016. SACOG was tasked by ARB to achieve a nine percent per capita reduction compared to 2012 emissions by 2020 and a 16 percent per capita reduction by 2035, which ARB confirmed the region would achieve by implementing its SCS (ARB 2016:172). The MTP/SCS forecasts land use development by community types: Center and Corridor Communities, Established Communities, Developing Communities, Rural Residential Communities, and Lands Not Identified for Development in the MTP/SCS Planning Period.

A portion of the RTP/SCS covers the Plan Area (i.e., Yolo County, the City of Davis, the City of West Sacramento, the City of Winters, and the City of Woodland); all jurisdictions with areas slated for development in the SCS growth projections.

California Code of Regulations, Energy Efficiency Standards

Energy consumption of new buildings in California is regulated by State Building Energy Efficiency Standards contained in the California Code of Regulations, Title 24, Part 2, Chapter 2-53. Title 24 applies to all new construction of both residential and nonresidential buildings, and regulates energy consumed for heating, cooling, ventilation, water heating, and lighting. The 2013 Building Energy Efficiency Standards have improved efficiency requirements from previous codes and the updated standards are expected to result in a statewide energy consumption reduction.

Effective January 1, 2011, CALGreen became California’s first green building standards code. It is formally known as the California Green Building Standards Code, Title 24, Part 11, of the California Code of Regulations. CALGreen establishes mandatory minimum green building standards and includes more stringent optional provisions known as Tier 1 and Tier 2. Cities and counties, at their discretion, may adopt Tier 1 or Tier 2 as mandatory or adopt and enforce other standards that are more stringent than the CALGreen Code.

Center for Biological Diversity v. California Department of Fish and Wildlife

In November 2015, the California Supreme Court issued its decision in *Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming* 62 Cal.App. 4th 204 (referred to as the Newhall Ranch decision hereafter). The case involved a challenge to the GHG analysis prepared in the EIR for the proposed Newhall Ranch development project in Southern California. The court ruled that the business-as-usual (BAU) methodology in the EIR did not provide sufficient evidence to conclude that the project’s GHG emissions would be consistent with the statewide reductions in the Scoping Plan. The court provided general guidance regarding the potential alternative approaches to GHG impact assessment that agencies may follow. In light of the Newhall Ranch decision, the BAU-based methodology is no longer a recommended approach for GHG analysis under CEQA; lead agencies must use their discretion on a project-by-project basis.

LOCAL LAWS AND REGULATIONS

Yolo-Solano Air Quality Management District

The YSAQMD has not adopted specific thresholds of significance for analyzing GHG emissions under CEQA. YSAQMD has developed threshold concepts for land use and stationary source projects in collaboration with the Sacramento Metropolitan Air Quality Management District and other air districts in the region. The threshold concepts recommend use of 1,100 metric tons of CO₂e per year (MT CO₂e/year) screening level for evaluating whether a project is consistent with the goal of reducing statewide GHG emissions to 1990 levels by 2020. Prior to the Newhall Ranch decision (discussed above) YSAQMD recommended that projects that would exceed the screening level would need to demonstrate a 21.7 percent reduction in GHG emissions from a “No Action Taken” (NAT) scenario which represents a scenario in which no GHG reduction regulations or measures are implemented. In light of the Newhall Ranch decision, YSAQMD now provides recommendations for GHG impact assessment on a project-by-project basis. In the case that GHG impacts are found to be significant, YSAQMD recommends that lead agencies require project-specific mitigation measures such as building code restrictions, increased public transportation, alternative fuels, or other actions that reduce CO₂.

Cool Counties Climate Stabilization Program

On September 11, 2007, Yolo County joined the Cool Counties Climate Stabilization Program. Under this program, Yolo County works with regional jurisdictions to achieve a fair-share reduction in regional GHG emissions of 80 percent by the year 2050. To achieve this goal, Yolo County has committed to the following: developing a GHG emissions inventory, adopting proactive short-, mid-, and long-term GHG reduction goals, and urging Congress to enact more stringent GHG regulations.

Yolo County 2030 General Plan

The Conservation and Open Space Element of the general plan contains the following goals and policies that may be relevant to the Plan:

- ▲ **Policy CO-7.1:** Encourage conservation of natural gas, oil and electricity, and management of peak loads in existing land uses.
- ▲ **Policy CO-7.3:** Require all projects to incorporate energy-conserving design, construction, and operation techniques and features into all aspects of the project including buildings, roofs, pavement, and landscaping.
- ▲ **Policy CO-7.6:** Encourage the use of building material and methods that increase energy efficiency a minimum of 15 percent beyond State Title-24 standards for residential buildings and 20 percent beyond State Title-24 standards for commercial buildings.
- ▲ **Policy CO-7.7:** Support farmers and landowners in their efforts to maximize the efficiency of agricultural end uses.
- ▲ **Policy CO-7.9:** Require that new site and structure designs maximize energy efficiency.
- ▲ **Policy CO-7.11:** Strongly encourage LEED certification or equivalent for all public, private and existing buildings and strongly encourage LEED Neighborhood Design (ND) certification or equivalent for other applicable projects, particularly within the Specific Plan areas.
- ▲ **Policy CO-8.1:** Assess current GHG emission levels and adopt strategies based on scientific analysis to reduce global climate change impacts.
- ▲ **Policy CO-8.2:** Use the development review process to achieve measurable reductions in GHG emissions.

- ▲ **Policy CO-8.3:** Prepare appropriate strategies to adapt to climate change based on sound scientific understanding of the potential impacts.
- ▲ **Policy CO-8.4:** Encourage all businesses to take the following actions, where feasible: replace high mileage fleet vehicles with hybrid and/or alternative fuel vehicles; increase the energy efficiency of facilities; transition toward the use of renewable energy instead of non-renewable energy sources; adopt purchasing practices that promote emissions reductions and reusable materials; and increase recycling.
- ▲ **Policy CO-8.5:** Promote GHG emission reductions by supporting carbon efficient farming methods (e.g. methane capture systems, no-till farming, crop rotation, cover cropping); installation of renewable energy technologies; protection of grasslands, open space, oak woodlands, riparian forest and farmlands from conversion to other uses; and development of energy-efficient structures.
- ▲ **Policy CO-8.6:** Undertake an integrated and comprehensive approach to planning for climate change by collaborating with international, national, State, regional, and local organizations and entities
- ▲ **Policy CO-8.7:** Integrate climate change planning and program implementation into County decision making.
- ▲ **Policy CO-8.8:** Increase public awareness about climate change and encourage county residents and businesses to become involved in activities and lifestyle changes that will aid in reduction of greenhouse gas emissions.
- ▲ **Policy CO-8.9:** Work with local, regional, State, and Federal jurisdictions, as well as private and non-profit organizations, to develop a regional GHG emissions inventory and emissions reduction plan.

Yolo County 2030 Climate Action Plan

Yolo County adopted a CAP in March 2011. The CAP established a target to reduce the 2008 level of emissions back to the levels estimated for 1990, or 613,651 metric tons. To achieve this target, 15 programs were proposed, including such measures as increasing renewable energy production, enhancing energy and water conservation, expanding alternative transportation, planting trees, and reducing fertilizer application. In order to meet the reductions envisioned in the Cool Counties Initiative and State legislation, the CAP also includes voluntary goals to reduce GHG emissions to 447,965 metric tons by 2030, and 122,730 metric tons by 2050.

City of Davis General Plan

The Community Resource Conservation Element of the general plan contains the following goals and policies that may be relevant to the Plan:

- ▲ **Policy ENERGY 1.1.:** Develop programs to increase energy conservation on the household and business level.
- ▲ **Policy ENERGY 1.2:** Develop a comprehensive program to reduce City government energy consumption.
- ▲ **Policy ENERGY 1.3:** Promote the development and use of advanced energy technology and building materials in Davis.
- ▲ **Policy ENERGY 1.4:** Continue to enforce landscaping requirements that facilitate efficient energy use or conservation.
- ▲ **Policy ENERGY 1.5:** Encourage the development of energy-efficient subdivisions and buildings.

City of Davis Climate Action and Adaptation Plan

The City of Davis adopted the Davis Climate Action and Adaptation Plan in June 2010. The Plan is designed to place the community on a path to achieve the local GHG emission reduction targets adopted by the City Council in November 2008. Those targets were based on a range that uses the State of California targets as a minimum goal and deeper reductions as the desired outcome. The City adopted this range in recognition that emission reductions are not precise and that many scientists believe that a reduction of 80 percent below 1990 levels by 2050 may not be adequate. The City adopted a series of “Phase One” actions to achieve reductions; setting an interim target for the year 2015, with 22 “Priority One” action proposals, in six general categories, that include mobility, energy, waste and consumption, food and agriculture, community engagement, and government operations.

City of West Sacramento General Plan

The City of West Sacramento General Plan contains the following goal and policies that relate to climate change that may be applicable to the analysis of the HCP/NCCP:

Goal S-4. To alleviate the effects of climate change by reducing greenhouse gas emissions and adapting to expected climate change impacts.

- ▲ **Policy S-4.3. Climate Action Policies.** The City shall, in collaboration with the stakeholders from the community, implement policies and measures to reduce greenhouse gas emissions from community, business, and municipal activities consistent with the targets described in Policies HS-5.1 and 5.2.
- ▲ **Policy S-4.5. State and Federal Action.** The City shall support State and Federal actions to reduce greenhouse gas emissions.
- ▲ **Policy S-4.7. Climate Change Monitoring and Adaptation.** The City shall monitor the local and regional impacts of climate change, and use adaptive management techniques and the latest climate change science to implement, and/or revise if necessary, strategies to respond to the expected impacts of climate change.

City of West Sacramento Draft Climate Action Plan

The City of West Sacramento prepared a Draft CAP in 2010. The Draft CAP sets a municipal goal to reduce emissions 15 percent from current levels by 2020. The City is also committed to reducing community-wide GHG emissions by 30 percent below a “Business as Usual” level based on a 2007 base year by 2020. Business as Usual assumes that emissions per resident and per employee continue at the same rate as in 2007 as the City grows. The Draft CAP proposes specific measures to reduce emissions from municipal and community-wide sources. At the time of writing this DEIS/DEIR, West Sacramento has yet to approve the Draft CAP; therefore, GHG targets established by the document are not yet enforceable.

City of Winters General Plan

The Natural Resources Element of the general plan contains the following goals and policies that may be relevant to the Plan:

- ▲ **Policy VI.F.1:** In approved new residential subdivisions, the City shall promote the maximum feasible east-west alignment of lots for southern solar exposure, as required by the State Subdivision Act.
- ▲ **Policy VI.F.2:** The City shall encourage and promote examples of energy efficient design and operation of new residential, commercial, and industrial development projects.
- ▲ **Policy VI.F.3:** For projects involving rehabilitation or modification of existing developments, the City shall promote the incorporation of energy-efficient features beyond state Title 24 requirements through fast-track processing and other incentives.

- ▲ **Policy VI.F.4:** The City shall provide for the dedication of sunlight easements in connection with land divisions, pursuant to Government Code Section 66475.3.
- ▲ **Policy VI.F.5:** Through its operation and management of existing municipal facilities, as well as planned new facilities, the City shall utilize energy efficient technologies to the maximum feasible extent.

The City of Winters is currently in the process of developing a CAP; however, at the time of writing of this DEIR/DEIS, a Draft CAP has not been released.

City of Woodland Final 2035 Climate Action Plan

The City of Woodland adopted a 2035 CAP in May 2017. The CAP presents a set of community-generated strategies to guide the City, its residents, and local businesses in reducing GHG emissions consistent with State goals for addressing California's contributions to rapid climate change. The CAP analysis identified a need for local GHG reductions of 60,226 metric tons of carbon dioxide equivalent per year (MT CO₂e/yr) by 2020 and 111,645-112,265 MT CO₂e/yr by 2035 in order to achieve Woodland's GHG targets. Most progress in reducing GHGs is expected to come from lowering energy use, using renewable energy, and reducing gas and diesel vehicle use. However, efforts in all areas are important to CAP implementation success. For example, land use planning strategies are essential to influencing lifestyles and travel modes and support transportation-related GHG reductions.

The 2035 CAP was developed simultaneously with the City's 2035 General Plan Update, which includes specific policy direction to implement the CAP in Policy 7.F.9 and Implementation Program 7.6. The City of Woodland General Plan also contains many goals and policies supporting the 2035 CAP that were considered during CAP development and analysis.

City of Woodland General Plan

The City of Woodland General Plan contains the following goal and policies that relate to climate change that may be applicable to the analysis of the HCP/NCCP:

Goal 7.F: Improve Air Quality and Reduce Greenhouse Gas Emissions. Protect and improve air quality in the Woodland area with the goal of attaining State and Federal health-based air quality standards.

- ▲ **Policy 7.F.5:** Electric Equipment. Promote inclusion of features such as exterior electrical outlets in new residential development to encourage the use of electric and other alternative fuel equipment.
- ▲ **Policy 7.F.7:** Inventory of Greenhouse Gas Emissions. Continue to maintain inventories of community-wide greenhouse gas emissions and greenhouse gas emissions from City operations and track related solid waste, energy, economic, and environmental data. Update the inventories periodically as additional data and methodologies become available.
- ▲ **Policy 7.F.9:** Climate Action Plan. Implement the Climate Action Plan to achieve the city's greenhouse gas reduction targets by 2020, 2035, and 2050.
- ▲ **Policy 7.F.10:** Public Awareness of Climate Change and Adaptation. Promote public awareness of the impacts of global climate change and provide information regarding steps that residents and businesses can take to reduce greenhouse gas emissions and adapt to its effects.
- ▲ **Policy 7.F.11:** Climate Change Resilience. Ensure resilience to the impacts of global climate change by considering these effects (including but not limited to increasing temperatures, heavier storms and other weather events, increased fire risk) in emergency preparedness planning.

16.4 ENVIRONMENTAL CONSEQUENCES

16.4.1 Methodology and Significance Criteria

METHODS AND ASSUMPTIONS

GHG emissions are typically categorized as direct (e.g., emissions directly emitted from a source such as vehicle tailpipe emissions) and indirect (i.e., emissions that occur associated with energy consumption from a local utility). The alternatives were evaluated in the context of the existing and planned development, land use patterns within the Plan Area, and emissions sources associated with them (e.g., stationary, mobile). Effects are identified where the actions or projects associated with the alternative would result in new or additional GHG emissions.

As described in Section 3.3, the issuance of ITPs by the Wildlife Agencies for take of 12 covered species associated with five categories of covered activities—together with subsequent adoption and implementation of the Plan by the Applicants consistent with the Permits—is the Proposed Action considered in this EIS/EIR. Issuance of permits by the Wildlife Agencies only provides compliance with the FESA and NCCPA.

All covered activities are subject to the approval authority of one or more of the Applicants with jurisdiction over such projects, and HCP/NCCP approval and permit issuance for take of covered species does not confer or imply approval from any entity other than the U.S. Fish and Wildlife Service (USFWS) or California Department of Fish and Wildlife (CDFW) to implement the covered activities. Rather, as part of the standard approval process, individual projects will be considered for further environmental analysis and generally will receive separate, project-level environmental analysis review under CEQA and, in some cases, NEPA for those projects involving federal Agencies.

Whether GHG emissions associated with individual development projects would contribute to substantial increases GHGs is discussed qualitatively based on whether GHGs associated with those projects could conflict with a plan, policy, or regulation adopted to reduce GHG emissions.

One mechanism by which alternatives could increase GHG emissions would be by increasing regional vehicle miles traveled (VMT), and thus, mobile-source CO₂. This could occur during both construction and operations. Construction and operations could also result in the use of heavy duty equipment which would be a source of exhaust.

GHG emissions associated with implementation of the Plan's conservation strategy are assessed quantitatively. More specifically, construction- and operational-related emissions from reserve system establishment and management were quantified using the California Emissions Estimate Model (CalEEMod). Modeling was conducted to estimate the level of GHGs associated with the implementation of habitat restoration or creation using conservative assumptions (i.e., assumptions that would lead to higher emissions). The modelling includes the use of heavy-duty equipment for earth movement and grading as well as operational-related vehicle use. Detailed model assumptions and parameters are included in Appendix E.

The assessment of potential effects on climate change is based on the anticipated changes in land cover and land uses over 50 years, corresponding to the permit term under the Proposed Action Alternative. Anticipated changes in land cover/land use for each alternative are described in Chapter 2, Proposed Action and Alternatives. See Chapter 3, *Approach to the Analysis*, for a description of the methodology used across all resource chapters for the analysis of cumulative effects.

As described in Chapter 2, *Proposed Action and Alternatives*, the Conservancy has proposed a number of changes to the HCP/NCCP since the release of the Draft on June 1, 2017. These changes are described and Characterized in Section 2.3.2, *Alternative B – Proposed Action Alternative (Permit Issuance/Plan Implementation)*, of Chapter 2.

These proposed changes fall into several categories;

- ▲ Copy edits such as correction of spelling errors,
- ▲ Minor text clarifications and corrections such as providing or correcting cross references to other parts of the document,
- ▲ Minor numeric corrections, such as small adjustments to acreages of particular land cover types,
- ▲ Providing updated information since publication of the Draft HCP/NCCP such as including information from the City of Woodland General Plan Update 2035, which was adopted after the Draft HCP/NCCP was published,
- ▲ Clarifications or enhancements to particular plan elements such as new or updated Avoidance and Minimization Measures (AMMs),
- ▲ Increased details on plan implementation such as providing additional information on the content of the Implementation Handbook, and
- ▲ Changes in assumptions regarding costs and funding to reflect updated information.

These proposed changes have been analyzed to determine whether they would result in any changes to the impact analysis or conclusions reached in the Draft EIS/EIR. This analysis is provided in Section 24.2, *Evaluation of Proposed Modifications to the Draft HCP/NCCP*. The analysis substantiates that the proposed changes to the HCP/NCCP do not alter the analysis or impact conclusions provided in the Draft EIS/EIR for climate change. Therefore, no changes to the analysis provided below are merited.

SIGNIFICANCE CRITERIA

Effects would be significant if an alternative would result in the following:

- ▲ generate GHG emissions, either directly or indirectly, that may have a significant effect on the environment;
- ▲ conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs; or
- ▲ result in inefficient and wasteful consumption of energy during construction or operations, or require new or expanded energy facilities that could cause significant environmental effects.

The following numeric thresholds provided by federal and local entities are used to assist in determining whether the thresholds above are exceeded.

Local Thresholds

- ▲ YSAQMD has not formally adopted quantitative thresholds that apply to the construction and operation phases of a project. However, YSAQMD has developed thresholds concepts for land use and stationary source projects in collaboration with the Sacramento Metropolitan Air Quality Management District, the air district and other air districts in the region. These include the following mass emission thresholds for evaluating the construction and operational phases of a proposed project: Construction phase of projects: 1,100 MT CO₂e/year; and
- ▲ Operational phase of projects: 1,100 MT CO₂e/year.

YSAQMD also recommends a mass emission threshold of 10,000 MT CO₂e/year for evaluating new stationary sources; however, this threshold is not applicable to the Plan because it would not result in any new large stationary sources of GHG emissions.

The mass emission threshold of 1,100 MT CO₂e/year for evaluating the construction and operational phases of projects is recommended for determining whether a project's construction and operational activities would be consistent with AB 32 and ARB's Climate Change Scoping Plan goal to reduce statewide GHG emissions to 1990 levels by 2020. Because the Plan is designed to protect species and their habitats beyond 2020, and some GHG emissions associated with construction and operational activities performed under the Plan would occur after 2020, these thresholds are adjusted to be more consistent with the goal established by SB 32 to reduce statewide GHG emission levels to 40 percent below 1990 levels by 2030. YSAQMD has not released a recommended threshold to reflect this reduction goal; however, as the 1,100 MT CO₂e/year threshold was developed to ensure a project's consistency with AB 32's goal of 1990 levels of GHGs by 2020, it is assumed that a 40 percent reduction in the 1,100 MT CO₂e/year threshold would be consistent with the SB 32 goal of 40 percent of 1990 GHG levels by 2030. Therefore, for the purposes of this analysis, the thresholds recommended by YSAQMD are reduced by 40 percent to the following levels:

- ▲ Construction phase of projects: 660 MT CO₂e/year, and
- ▲ Operational phase of projects: 660 MT CO₂e/year.

16.4.2 Effects of Proposed Action and Alternatives

ALTERNATIVE A—NO ACTION ALTERNATIVE (NO PERMIT/NO PLAN IMPLEMENTATION)

Environmental Consequences/Environmental Effects

As described previously in Chapter 2, *Proposed Action and Alternatives*, under the No Action Alternative (Alternative A), take associated with development would occur over the 50-year study period consistent with the local general plans and other applicable planning documents (e.g., community plans, specific plans, recreation plans). As also described in Chapter 2, for purposes of this analysis, development and related activities (e.g., operations and maintenance) under the No Action Alternative are considered using the same organizational categories identified in the Yolo HCP/NCCP; urban projects and activities; rural projects and activities, which includes rural public services, infrastructure, and utilities, agricultural economic development and open space; and public and private operations and maintenance. Under the No Action Alternative, the Plan would not be approved and implemented and no Endangered Species Act authorizations would be issued by the USFWS or CDFW related to the Plan. Endangered species permitting and mitigation would continue on an individual project-by-project basis.

Construction associated with any of the categories of development and related activities would result in GHG emissions from the use of heavy-duty construction equipment and from construction equipment and vehicle exhaust (i.e., worker commute vehicles and haul truck trips). Operational-related emissions associated with incidental take authorization and related activities would include mobile sources and stationary sources. Urban and rural development projects would result in direct and indirect GHG emissions during operation (e.g., electricity usage, wastewater treatment). Infrastructure (e.g., roads and any airport) built under the No Action Alternative would contribute to increases in mobile-source emissions of GHGs throughout the Plan Area. Operational emissions of GHGs from mobile and stationary sources associated with individual ground disturbance and other related activities could exceed applicable local thresholds of 660 MT CO₂e /year for operation and applicable thresholds for stationary point sources could also be exceeded, and thus would cause a considerable contribution to climate change. Further, these operational GHG emissions could conflict with an applicable plan, policy, or regulation adopted to achieve local, regional, or statewide GHG reduction goals. However, both construction and operational GHG emissions associated with ground disturbance and other related activities would be reduced through successful implementation of applicable CAPs and/or GHG reduction policies in applicable general plans. Also, individual projects reviewed under CEQA that would

generate GHG emissions in exceedance of applicable thresholds would be required to implement feasible GHG reduction measures.

As the development and other activities described above would be implemented as part of the No Action Alternative, impacts to threatened and endangered species and other biological resources would occur, requiring mitigation. Mitigation measures would likely include on-site areas of preservation within a specific project site, and smaller, non-contiguous areas of preservation lands throughout Yolo County, or nearby sites outside the county with authorization from the permitting agencies. Generally, these required mitigation actions under the No Action Alternative would either retain lands in their existing condition (i.e., reserve habitat), or convert lands to a more natural state (i.e., habitat restoration or creation).

Establishment of protected mitigation lands under the No Action Alternative would include minor maintenance activities such as earth movement and grading, fence installation. The use of heavy equipment for grading and earth moving would generate exhaust emissions of GHGs. Annual levels of construction-related GHGs were estimated using CalEEMod. These estimates were based on conservative assumptions of protected mitigation lands system size and likely maintenance equipment that would be used (e.g., trucks, loaders, backhoes). Refer to Appendix E for detailed assumptions about the types and sizes of heavy-duty maintenance equipment (e.g., horsepower rating, load factors, engine model year). Based on the modeling conducted, establishment of protected mitigation lands that include habitat restoration or creation could result in up to 472 MT CO₂/year from the use of heavy-duty equipment, worker commute trips, and material haul trips. This level of emissions would not exceed the applicable significance criterion of 660 MT CO₂e/year; therefore, construction-related GHG emissions would not further contribute considerably to already existing significant and unavoidable, cumulative GHG impacts.

Operational emissions associated with construction and protected mitigation lands system management would include mobile-source exhaust emissions associated with visits by protected mitigation lands system managers/crews for maintenance and monitoring and similar activities. Although details regarding the specific activities or operational/maintenance-related VMT are not known at this time, an estimate of emissions was conducted based on conservative assumptions about protected mitigation lands system size, equipment that would be used, and activities that would take place (e.g., trucks, loaders, backhoes). Refer to Appendix E for detailed assumptions. Based on the modeling conducted, protected mitigation lands system maintenance and operational activities could result in emissions of up to 442 MT CO₂/year. This estimation is also conservative because it does not account for any of the carbon sequestration-related benefits that would result from new trees or vegetation planted as part of restoration or protected mitigation lands system maintenance efforts. This level of emissions would not exceed the applicable significance criterion of 660 MT CO₂e/year. Therefore, operational GHG levels associated with protected mitigation lands system management would not result in substantial GHG emissions.

Construction and development related activities anticipated to occur under the No Action Alternative would result in more energy use than under existing conditions. Energy consumption would generally occur in four forms: (1) the fuel energy consumed by construction vehicles; (2) bound energy in construction materials; (3) ongoing energy required for interior and exterior lighting, heating/ventilating/air conditioning, computer and electronics systems; and (4) the consumption of transportation energy.

Construction Vehicles. Fossil fuels would be used by heavy duty equipment and vehicles and other energy-consuming equipment during construction. Standard criteria pollutant emission reduction practices discourage unnecessary idling and the operation of poorly maintained equipment.

Construction Materials. The incremental increase in the use of energy bound in construction materials such as asphalt, steel, concrete, or pipes, and manufactured or processed materials such as lumber and gas would not substantially increase demand for energy compared to overall regional demand for such materials. Construction materials would not be used in a wasteful manner in large part because such waste would increase construction costs.

Operational Energy Requirements. Compliance with California's Title 24 Energy Efficiency Standards would generally promote operational energy efficiency of structures. All new buildings in California must meet the standards contained in Title 24 on the date a building permit application is made, and energy efficiency requirements are enforced by local governments through the building permit process. Minimum efficiency standards, including those for household appliances, water and space heating and cooling equipment and insulation for doors, pipes, walls and ceilings would ensure that the proposed project would not use energy in a wasteful manner.

Transportation Energy. State and federal regulations regarding fuel efficiency standards for vehicles in California are designed to reduce wasteful, unnecessary, and inefficient use of energy for transportation. Further, local planning documents generally encourage project design to limit fuel consumption by located projects in areas with existing infrastructure and encouraging alternative transportation. Fuel consumption associated with vehicle trips generated under the No Action Alternative is not anticipated to be inefficient, wasteful, or unnecessary in comparison to other similar developments in the State.

As discussed above, there are a variety of mechanisms in place that would lead to or require energy efficiency, result in the use or development of alternative energy, or otherwise reduce energy consumption. For example, the regulations identified above, including California's Title 24 Energy Efficiency Standards, general plan policies, CAPs, and other local and regional plans that reduce the level of vehicle miles traveled (VMT), would be applied to projects. These regulations are intended to guide projects so that they do not result in inefficient and wasteful consumption of energy.

In addition, the California Public Utilities Commission obligates energy providers to maintain the capacity to provide energy to planned projects. As it is anticipated that development under the No Action Alternative would be consistent with applicable land use plans, which utilities incorporate into their assessment of infrastructure needs, it is anticipated that there would be adequate service available to meet the generated demand.

As discussed in Section 16.3.1, the effects of climate change include rising global temperatures, increased frequency and intensity of wildland fire, changes in precipitation, rising sea levels, and a decrease in snow pack. The activities under the No Action Alternative would be subject to these climate factors except sea level rise. The Plan Area is located in Yolo County, which is located more than 50 miles inland from the Pacific Ocean. Although the elevation in some parts of the County are near sea level, particularly in the portions that are part of the Sacramento-San Joaquin Delta, the effects of sea level rise would be reduced with distance from the ocean. The declining effects of ocean tides on water levels in the Sacramento-San Joaquin Delta is evidence of this effect. Portions of the Delta more distant from the ocean experience declining water elevation changes from the tides. In Yolo County, there is little to no evidence of tidal effects. Therefore, projected rises in sea level would not adversely affect the Plan Area. However, increases in temperature and wildland fire, changes in precipitation patterns, and a smaller snow pack leading to altered flow patterns in rivers fed by the Sierra snowpack, such as the Sacramento River, could directly affect the Plan Area and protected mitigation lands. The ability of protected mitigation lands to be resilient to these changing conditions would be influenced by factors such as protected mitigation lands size, connectivity between protected mitigation lands to support species movement, and buffers between protected mitigation lands and adjacent development.

Cumulative Effects

Based on the global nature of GHG emissions, the global climate change analysis is inherently cumulative. GHG emissions resulting from implementation of all alternatives, including the No Action Alternative, would be cumulative contributions to a global issue. Available local emissions thresholds and the CEQ recommendations are used to assess whether the GHG emissions of an alternative make a substantial contribution to the global cumulative effects of climate change. Therefore, the cumulative impacts of the No Action Alternative on existing and future conditions are identical to those described above.

ALTERNATIVE B—PROPOSED ACTION ALTERNATIVE (PERMIT ISSUANCE/PLAN IMPLEMENTATION)

Environmental Consequences/Environmental Effects

The Proposed Action Alternative (Alternative B) incorporates the same development-related activities identified for the No Action Alternative (urban projects and activities, rural projects and activities, and public and private operations and maintenance), with the HCP/NCCP providing a mechanism for the Wildlife Agencies to provide incidental take authorization for these lawfully undertaken covered activities. Climate change impacts as a result of these activities would be the same as described under the No Action Alternative. While the types and quantities of agricultural activities and their associated GHG emissions may change, such changes would not be the result of the Proposed Action Alternative.

Where the Proposed Action Alternative differs from the No Action Alternative is in the implementation of the Yolo HCP/HCCP, including its conservation strategy and neighboring landowner protection program, as well as the required use of Avoidance and Minimization Measures (AMMs) during implementation of development related activities. This impact discussion focuses on these elements of the HCP/NCCP that differ from the No Action Alternative. Components of the conservation strategy include but are not limited to habitat assessment surveys and population surveys; habitat management; restoration, enhancement, and creation of habitats; conversion of agricultural lands to create habitat; construction of facilities necessary for management and maintenance; and monitoring; and control of invasive nonnative species. The primary result of the neighboring landowner protection program from a GHG emissions perspective, however, would be the general preservation of existing conditions on lands adjacent to the Plan reserve system lands, and therefore, little to no change in GHG emissions associated with those lands. The voluntary neighboring landowner protection program is described in more detail in Chapter 2, *Proposed Project and Alternatives*. Because the program would not change land uses or their associated GHG emissions, it would not have an effect on GHG levels in the atmosphere, and is not evaluated further.

Effect CC-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

Under the Proposed Action Alternative, implementation of the conservation strategy would include management activities that entail the construction, maintenance, repair, replacement, and use of facilities required to operate the reserve system, including maintenance sheds, shade structures, roads, culverts, fences, gates, wells, stock tanks, and stock ponds. Habitat enhancement, restoration, creation, management, and monitoring would also be conducted. Though the Proposed Action Alternative relies on the continued agricultural use of the land, changes to the types and quantities of agricultural activities, and related GHG emissions, are not expected to result from implementation of the Proposed Action Alternative. The level of agricultural-related GHG emissions under the Proposed Action Alternative would not be different than under the No Action Alternative. Implementation of the Plan's management activities under the Proposed Action Alternative would result in GHG emissions similar to those described under the No Action Alternative and have analogous effects with respect to climate change. Applicable significance criteria for GHG emissions would not be exceeded (i.e., 660 MT CO₂e/year).

However, the conservation strategy under the Proposed Action Alternative would result in a reserve system that is consolidated and more contiguous than under the No Action Alternative and managed by a single entity. This would support more efficient reserve system lands operation, such as allowing a single vehicle trip to be used to conduct reserve management and monitoring on multiple reserve system lands, as opposed to multiple reserve system management entities each making separate trips to conduct management and monitoring on individual preserves. Reduced vehicle trips, and associated reductions in VMT, would also result in reduced GHG emissions from reserve system operations and maintenance as compared to the No Action Alternative.

Although establishment and operation of reserves under neither the Proposed Action Alternative nor the No Action Alternative would result in GHG emissions that would have a significant effect on the environment, overall emissions from reserve system operations are anticipated to be slightly less or similar under the Proposed Action Alternative.

Potential effects from establishment and management of a reserve system under the Proposed Action Alternative would not generate a substantial level of GHGs.

NEPA Level of Significance: As compared to the No Action Alternative, this impact is **less than significant**.

CEQA Level of Significance: As compared to Existing Conditions, this impact is **less than significant**.

No mitigation is required

Effect CC-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

As discussed above for Effect CC-1, establishment and operation of the reserve system under the Proposed Action Alternative would not exceed the applicable GHG significance criteria, and therefore would not constitute a substantial contribution of GHG emission that would conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing GHG emissions. Overall GHG emissions from reserve system operations would be slightly less or similar under the Proposed Action Alternative than under the No Action Alternative.

NEPA Level of Significance: As compared to the No Action Alternative, this impact is **less than significant**.

CEQA Level of Significance: As compared to Existing Conditions, this impact is **less than significant**.

No mitigation is required

Effect CC-3: Result in inefficient and wasteful consumption of energy, or require new or expanded energy facilities.

Appendix F of the State CEQA Guidelines requires consideration of the potentially significant energy implications of a project. CEQA requires mitigation measures to reduce “wasteful, inefficient and unnecessary” energy usage (Public Resources Code Section 21100, subdivision [b][3]). However, neither the law nor the State CEQA Guidelines establish thresholds that define wasteful, inefficient, or unnecessary use. Therefore, this section includes a qualitative discussion of the potential for the project to result in the inefficient or wasteful consumption of energy.

Energy would be required to construct projects provided incidental take authorization through the HCP/NCCP. This one-time energy expenditure required to construct physical infrastructure would be non-recoverable. Most energy consumption would result from operation of reserve maintenance equipment, and indirect energy consumption would be associated with the production and transport of reserve maintenance materials. There are no unusual project characteristics that would necessitate the use of reserve maintenance equipment that would be less energy efficient than those used for comparable activities in other parts of the State. As discussed above for the No Action Alternative, the incremental increase in the use of energy bound in reserve maintenance materials would not be substantial when compared to overall local and regional demand for reserve maintenance materials. Energy efficiency is also expected for the offsite production of reserve maintenance materials, based on the economic incentive for efficiency. Non-renewable energy would not be consumed in a wasteful, inefficient, or unnecessary manner when compared to other reserve maintenance sites in the region.

Energy demand for establishment and operation of reserve system lands has been quantified through CalEEMod calculations for a habitat restoration effort, which would be the greatest energy consuming activity related to the reserve system. As described above for the No Action Alternative, reserve system establishment that includes habitat restoration or creation could produce up to 472 MT CO₂/ year from the use of heavy-duty equipment, worker commute, and vendor haul trips; reserve system maintenance and operational activities could result in emissions of up to 442 MT CO₂/year. There is potential that the reserves established under the Proposed Action Alternative could be somewhat more energy efficient than those modeled for the No Action Alternative because they would be consolidated when compared to the No Action Alternative. Further, where reserve system lands are a continuation of existing conditions, there would be little to no change in energy consumption. Overall energy consumption for establishment and

management of reserve system lands would not be substantial and there are no unique or special circumstances that would result in a wasteful use of energy. The projected energy consumption would not require additional capacity or substantially increase peak or base period demands for electricity and other forms of energy.

As discussed above for the No Action Alternative, the development for which the HCP/NCCP would provide take coverage is included in the local planning documents used by utility providers to forecast demand and is not expected to require new or expanded energy facilities not anticipated by the energy provider. Further, any new or expanded energy facilities are included within the overall development receiving incidental take authorization.

The energy use of development with incidental take coverage and the reserve system under the Proposed Action Alternative would be generally similar to the energy use of the anticipated take associated with development and individual reserves anticipated under the No Action Alternative. Therefore, implementation of the Proposed Action Alternative would result in a less-than-significant impact relative to the No Action Alternative.

NEPA Level of Significance: As compared to the No Action Alternative, this impact is **less than significant**.

CEQA Level of Significance: As compared to Existing Conditions, this impact is **less than significant**.

No mitigation is required

Effect CC-4: Effects of climate change to the action.

As discussed above in Section 16.2.1 and the evaluation of the No Action Alternative, climate change may result in various effects on reserves in the Plan Area related to precipitation amounts and patterns, temperature, wildfire risk, and snow pack effects on river flows. These changes could result in adverse effects to reserve systems. Given the amount of uncertainty and number of variables involved, it would be speculative to attempt to predict the future effects of climate change on any particular species or ecosystem in the Plan Area. Although, if adverse effects from climate change were to occur in reserve system lands, the larger interconnected reserve system associated with the Proposed Action Alternative would be more resilient to changing climatic conditions than the smaller more discrete reserves associated with the No Action Alternative. Also, the buffers provided between reserves and adjacent land uses included as part of the conservation strategy under the Proposed Action Alternative would add further resiliency to potential climate change effects.

NEPA Level of Significance: As compared to the No Action Alternative, this impact is **beneficial**.

CEQA Level of Significance: As compared to Existing Conditions, this impact is **beneficial**.

No mitigation is required

Cumulative Effects

As described previously for the No Action Alternative, effects related to GHG emissions and global climate change, by their nature, are cumulative. Therefore, cumulative impacts of the Proposed Action Alternative would be the same as those described above for the No Action Alternative.

NEPA Level of Significance: As compared to the No Action Alternative, this impact is **less than significant**.

CEQA Level of Significance: As compared to Existing Conditions, this impact is **less than significant**.

ALTERNATIVE C-REDUCED TAKE ALTERNATIVE

Environmental Consequences/Environmental Effects

The Reduced Take Alternative would include the same categories of covered activities as the Proposed Action Alternative; however, under the Reduced Take Alternative, there would be eight areas designated for development under the Proposed Action Alternative where activities that would result in take of covered species would be not be permitted. See Chapter 2, Section 2.3.3, *Alternative C-Reduced Take Alternative* for more information on this alternative.

If the prohibition on take of covered species in the eight designated areas resulted in less overall development in the Plan Area, effects from mobile and area source GHG emissions from take associated with development related activities could be slightly less under the Reduced Take Alternative than under the No Project Alternative. However, the prohibition on take in the eight areas could result in the development planned for these locations being diverted to another part of the Plan Area. If any of the new locations were farther from development centers, this could result in more frequent and longer vehicle trips and an increase in mobile-source GHG emissions from development related activities. As discussed above for the Proposed Action Alternative, overall energy consumption for establishing and managing the reserve system is small and there would be no unique or special circumstances that would result in a wasteful use of energy.

Climate change effects from implementation of the conservation strategy would be minimal; therefore, the reduced level of mitigation requirements would not make a change to the level of climate change-related effects in the Plan area relative to the Proposed Action Alternative.

Overall, under the Reduced Take Alternative, Effects CC-1 through CC-4 would not be appreciably different from what is described for the Proposed Action Alternative.

NEPA Level of Significance: As compared to the No Action Alternative, this impact is similar and is **less than significant**.

CEQA Level of Significance: As compared to the Proposed Action Alternative, this impact is similar and is **less than significant**.

No mitigation required

Cumulative Effects

As described previously for the No Action Alternative, effects related to GHG emissions and global climate change, by their nature, are cumulative. Therefore, cumulative impacts of the Reduced Take Alternative would be the same as those described above for the No Action Alternative and Proposed Action Alternative.

NEPA Level of Significance: As compared to the No Action Alternative, this impact is similar and is **less than significant**.

CEQA Level of Significance: As compared to the Proposed Action Alternative, this impact is similar and is **less than significant**.

ALTERNATIVE D-REDUCED DEVELOPMENT ALTERNATIVE

Environmental Consequences/Environmental Effects

The Reduced Development Alternative would include the same categories of covered activities as the Proposed Action Alternative, but under the Reduced Development Alternative, development within a portion of the west side of the Dunnigan area, and the Elkhorn Specific Plan Area, would not be covered activities under the HCP/NCCP. Any development that resulted in take of listed species in these locations would be required to

obtained FESA and CESA authorization on a project-by-project basis (See Chapter 2, Section 2.3.4, *Alternative D-Reduced Development Alternative* for more information on this alternative).

Impacts related to GHG emissions and climate change as a result of implementation of the Reduced Development Alternative would be similar to those discussed above for the No Action and the Proposed Action Alternatives. Because the two areas that would not be covered by the HCP/NCCP could still be developed, the overall development scenario may ultimately not differ from the No Action Alternative and Proposed Action Alternative. Although any development in the two identified areas would not be development related activities under the HCP/NCCP, mitigation for effects on covered species would still be required, which would likely result in some level of habitat reserve establishment. As discussed above for the Proposed Action Alternative, overall energy consumption for establishing and managing the reserve system is small and there would be no unique or special circumstances that would result in a wasteful use of energy. Overall, under the Reduced Development Alternative, Effects CC-1 through CC-3 would not be appreciably different from what is described for the Proposed Action Alternative.

Climate change effects from implementation of the conservation strategy would be minimal under the Reduced Development Alternative; therefore, the reduced level of mitigation requirements would not make a change to the level of climate change-related effects in the Plan area relative to the Proposed Action Alternative.

NEPA Level of Significance: As compared to the No Action Alternative, this impact is similar and is **less than significant**.

CEQA Level of Significance: As compared to the Proposed Action Alternative, this impact is similar and is **less than significant**.

No mitigation is required

Cumulative Effects

As described previously for the No Action Alternative, effects related to GHG emissions and global climate change, by their nature, would be cumulative. Therefore, cumulative impacts of the Reduced Development Alternative would be the same as those described above for the No Action Alternative and the Proposed Action Alternative.

NEPA Level of Significance: As compared to the No Action Alternative, this impact is similar and is **less than significant**.

CEQA Level of Significance: As compared to the Proposed Action Alternative, this impact is similar and is **less than significant**.

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