Global Climate Change Evaluation

for the

Otay Ranch Resort Village Specific Plan
ER-04-19-005, KIVA 3810-04-002

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Appendix A Greenhouse Gas Emission Calculations

List of Acronyms

APCD	Air Pollution Control District
AB	Assembly Bill
AB 32	Assembly Bill 32, Global Warming Solutions Act of 2006
ARB	Air Resources Board
ASTM	American Society of Testing and Materials
CalEEMod	California Emissions Estimator Model
CAPCOA	California Air Pollution Control Officers Association
CAT	Climate Action Team
CCAP	Center for Clean Air Policy
CCAR	California Climate Action Registry
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DWR	Department of Water Resources
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
EV	Electric Vehicles
GCC	Global Climate Change
GHG	Greenhouse Gas
GGEP	Greenhouse Gas Emissions Policy
GGRP	Greenhouse Gas Reduction Plan
GP	General Plan
GWP	Global Warming Potential
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LEED	Leadership in Energy and Environmental Design
MMT	Million Metric Tons
MW	Megawatts
N_2O	Nitrous Oxide
NOx	Oxides of Nitrogen
OPR	State Office of Planning and Research
PDFs	Project Design Features
PFCs	Perfluorocarbons
PM	Particulate Matter
ROG	Reactive Organic Gas
RPS	Renewable Portfolio Standards
S-3-05	Executive Order S-3-05
SB	Senate Bill
SDCGHGI	San Diego County Greenhouse Gas Inventory
SRI	Solar Reflective Index

THC	Total Hydrocarbon
UNFCCC	United Nations Framework Convention on Climate Change
USBGC	U.S. Green Building Council
VMT	Vehicle Miles Traveled

Executive Summary

This report presents an assessment of potential global climate change impacts associated with the Otay Ranch Resort Village (proposed Project). The Project proposes to develop a resort; 1,881 single-family residences; 57 multi-family residences; a school; park and recreation amenities; and, 40,000 square feet of retail uses. Under the optional development scenario, 20,000 square feet of retail uses and the 57 multi-family residences would be replaced by 57 single-family residences. The evaluation addresses the potential impacts of greenhouse gas (GHG) emissions associated with construction and operation of the proposed Project.

In the 2008 Scoping Plan, the ARB estimated that the State of California emitted 427 MMT CO_2e in 1990. The ARB also projected that the State would emit 596 MMT CO_2e in 2020, thereby requiring a reduction of 169 MMT CO_2e emissions by 2020 in order to return to the 1990 levels (ARB 2008), as required by AB 32. This estimate was updated in the 2011 *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* (ARB 2011a) based on new economic data and the incorporation of certain existing regulatory standards. Based upon the update, the ARB determined in the 2011 Supplement that the State is projected to emit 507 MMT CO_2e in 2020, and that a reduction of 80 MMT would be required by 2020 in order to return to the 1990 levels. The 80 MMT reduction correlates to a 16% reduction in GHG emissions.

A summary of the Project's emissions is provided in Table ES-1a, and a summary of the optional development scenario's emissions is provided in Table ES-1b. As shown in Tables ES-1a and ES-1b, with implementation of GHG reducing project design features, both the proposed Project and the optional development scenario would meet the goals of AB 32 by achieving a percentage reduction greater than the 16% identified by the ARB in the 2011 Supplement. The proposed Project and optional development scenario would, therefore, not result in any direct impacts to the global climate, and cumulative impacts would be less than significant.

Table ES-1a SUMMARY OF PROJECT'S ESTIMATED OPERATIONAL GREENHOUSE GAS EMISSIONS- 2020				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Sources	582	0.0333	0.0102	586
Electricity Use	2,840	0.1182	0.0323	2,852
Natural Gas Use	3,516	0.0674	0.0645	3,535
Water Consumption	607	3.6141	0.09111	732
Solid Waste Handling	407	24.0396	0	1,080
Vehicles	24,902	0.9875	0	24,930
Amortized Construction	977	0	0	977
Total	**33,831**	**28.8601**	**0.1981**	**34,692**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2e Emissions	33,831	808	52	34,692
TOTAL CO_2e Emissions	**34,692**			
Project without PDFs CO_2e Emissions	**41,997**			
Percent Reduction	**17.40%**			

Table ES-1b SUMMARY OF OPTIONAL DEVELOPMENT SCENARIO'S ESTIMATED OPERATIONAL GREENHOUSE GAS EMISSIONS- 2020				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Sources	582	0.0337	0.0102	586
Electricity Use	2,823	0.1175	0.0321	2,835
Natural Gas Use	3,553	0.0681	0.0651	3,572
Water Consumption	601	3.5753	0.0902	725
Solid Waste Handling	410	24.2278	0.0000	1,088
Vehicles	23,638	0.9347	0.0000	23,664
Amortized Construction	977	0	0	977
Total	**32,584**	**28.9571**	**0.1976**	**33,447**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2e Emissions	32,584	811	52	33,447
TOTAL CO_2e Emissions	**33,447**			
Project without PDFs CO_2e Emissions	**40,542**			
Percent Reduction	**17.50%**			

Table ES-2 provides a summary of the project design features that will be implemented by the Otay Ranch Resort Village Specific Plan to reduce GHG emissions.

Table ES-2
Proposed Project Design Features to Reduce GHG Emissions

Strategy to Reduce GHG Emissions	Description	Emission Reduction	Basis for Emission Reduction
Land Use and Community Design			
Pedestrian Oriented Development	The Otay Ranch Resort Village land use plan locates a school, parks, and commercial land uses in proximity to residential areas to encourage pedestrian and bicycle travel as an alternative to the automobile. In addition, the Resort Village Trail and Pathway system provide alternate routes to these destinations.	Conservatively, no credit was taken for mixed uses at the site.	CAPCOA White Paper, Appendix B
Street Widths, Pavement and Street Trees	The Otay Ranch Resort Village land use plan includes narrow streets and reduced paving, which reduces heat buildup and the demand for air conditioning. Street trees also are included in the land use plan in order to provide shade that further reduces ambient air temperatures.	No reduction assumed.	CAPCOA White Paper, Appendix B
Transit Facilities and Alternative Transportation Modes			
Public Transportation	The applicant or designee will coordinate with the Chula Vista Transit (CVT) and the San Diego Association of Governments (SANDAG) to evaluate the feasibility of providing bus service to the site. Currently, CVT provides bus service through the Chula Vista Eastern Territories including the Eastlake Business Center and nearby Southwestern College.	No reduction assumed.	CAPCOA White Paper, Appendix B
Transportation Demand Management	The applicant or designee shall develop a transportation demand management program to ensure ridesharing and carpooling for residents and employees.	No reduction assumed.	N/A
Alternative Travel Modes	Otay Ranch Resort Village streets will provide for a maximum travel speed of 30 miles per hour, which allows the streets to be used by electric carts and bicycles.	No reduction assumed.	CAPCOA White Paper, Appendix B
Alternative Travel Modes	Off-street pathways and trails in the Resort Village will accommodate pedestrian and bicycle travel.	No reduction assumed.	CAPCOA White Paper, Appendix B

Alternative Travel Modes	The Homeowners Association will partner with the elementary school to create a "walking school bus program" for neighborhood students to safely walk to and from school to reduce vehicular trips for drop-off and pick-up.	No reduction assumed.	N/A
Energy Efficiency			
Energy Efficiency	Indoor residential appliances will carry the Environmental Protection Agency's (EPA) ENERGYSTAR® certification, as applicable and feasible.	Accounted for in CalEEMod Model.	CAPCOA White Paper, Appendix B
Energy Efficiency	All residential units will be part of the local utility demand response program to limit peak energy usage for cooling. Through the site design and building permit process, the Project will incorporate solar panels on buildings to offset the Project's overall electricity usage by 30%.Peak solar performance tends to coincide with peak energy usage. Thus, the Project-wide incorporation of solar will further limit peak energy usage.	No reduction assumed as to demand response program participation. (See below for information regarding commitment for provision of on-site solar resources.)	N/A
Water Conservation			
Low-Flow Fixtures	Indoor residential plumbing products would comply with the 2013 CALGreen Code, including future updates to CALGreen as these updates apply to homes in the project built under the updated code. The GHG emission reductions benefits of this PDF have been quantitatively incorporated into the Project's GHG inventory by including a measure within CalEEMod to account for the use of low-flow fixtures in all buildings.	Accounted for in CalEEMod Model.	CalEEmod Model

Water Conservation Plan	The Project includes a Water Conservation Plan that that will reduce outdoor water usage by 30% compared to existing outdoor water usage for typical residential homes. Through the Project's site plan process and, in the case of individual homeowners, the Project's CC&Rs, the Water Conservation Plan will require compliance with the County's "Water Conservation in Landscaping Ordinance" (aka, "Model Landscape Ordinance") for all outdoor landscapes in the Project, including common areas, public spaces, parkways, medians, parking lots, parks, and all builder or homeowner installed private front and backyard landscaping. The Water Conservation Plan goes beyond the County's Ordinance by applying to all landscaping installed in the Project. Consistent with the County's Ordinance, the Water Conservation Plan requires the use of a water allocation-based approach to landscape zones, use of drought-tolerant, low-water usage native plants, high-efficiency weather- or evapotranspiration-based irrigation controllers, soil moisture sensors, and drip emitters, soaker hose (e.g., netafim), or equivalent high-efficiency drip irrigation, and limitations on the use of natural turf in residential development to no more than 30% of the outdoor open space. Landscape plans and construction documents for developer and builder installed landscaping will be reviewed and approved by PDS for conformance with the Project's Water Conservation Plan. Individual homeowners will also have to show compliance with the Water Conservation Plan for front and backyard landscaping and may require separate permitting through the County for landscaping of 1,000 square feet or greater in size. The GHG emission reductions benefits of this PDF have been quantitatively incorporated into the Project's GHG inventory by including a measure within CalEEMod to account for a reduction in outdoor water use for irrigation of 30%. This is consistent with the requirements of the Resort Village Water Conservation Plan, Appendix VI to the Resort Village Specific Plan.	30% for outdoor water uses.	Water Conservation Plan
Building and Site Design			

California 2013 Title 24 Building Energy Efficiency Standards as well as the 2013 "CALGreen" Building Code	Residential buildings would be designed to meet the California 2013 Title 24 Building Energy Efficiency Standards as well as the 2013 "CALGreen" Building Code, including future updates to these codes as these updates apply to homes in the project built under the updated codes.	CEC study: Single family residential: 36.4% reduction in electricity use, 6.5% reduction in natural gas use; multi-family residential: 23.3% reduction in electricity use, 3.8% reduction in natural gas use; nonresidential: 21.8% reduction in electricity use, 16.8% reduction in natural gas use.	CEC 2013
Curbside recycling	Project-wide curbside recycling for single-family, multi-family, resort, school, commercial, and retail establishments would be required in accordance with the California Integrated Waste Management Act (AB 939). The GHG emission reductions benefits of this PDF have been quantitatively incorporated into the Project's GHG inventory by including a measure within CalEEMod to account for a reduction in solid waste generation of 20%.	20% reduction in solid waste generation from CalEEMod defaults.	County of San Diego 2014
EV Plug-Ins	Dedicated circuits for electric vehicle plug-in facilities/stations would be installed in all residential garages per the 2015 CALGreen Interim Code Update (Effective July 1, 2015). The GHG emission reduction benefits of this PDF conservatively have not been quantified and not incorporated into the Project's GHG inventory.	No reduction assumed.	N/A
Passive Solar Design	The site design will incorporate passive solar design and building orientation principles to take advantage of the sun in the winter for heating and reduce heat gain and cooling needs during the summer.	No reduction assumed.	CAPCOA White Paper, Appendix B
Passive Solar Design	Vertical landscape elements such as trees and large shrubs shall be installed in order to shade southern and western building facades to reduce energy needed for heating and cooling.	No reduction assumed	CAPCOA White Paper, Appendix B
Solar Access – Hot Water	All single-family structures will be designed and constructed to allow for the later installation of solar hot water heaters.	No reduction assumed.	N/A
Lighting			

Energy-Efficient Lighting	As required by the construction document approval process, and subject to the approval of PDS, energy efficient LED lighting in compliance with the lead agency's illumination and energy conservation requirements will be installed along streets, parks, parking lots, and other public spaces. Through the building permit process, private developers and home builders in the project are required to use energy efficient lighting and design in accordance with Title 24 requirements. The GHG emission reduction benefits of this PDF conservatively have not been quantified and not incorporated into the Project's GHG inventory.	No reduction assumed.	N/A
Renewable Energy			
Solar Power	Through the site design and building permit process, the Project will incorporate solar panels on buildings to offset the Project's overall electricity usage by 30%.	30% offset of the Project's electrical energy usage.	Project-specific design feature

1.0 INTRODUCTION

This report presents an assessment of potential global climate change impacts associated with the proposed Otay Ranch Resort Village Project. The evaluation addresses the potential impacts of greenhouse gas emissions associated with construction and operation of the proposed Project.

The Applicants have applied for approval of the Otay Ranch Resort Village (proposed Project) located northeast of Lower Otay Lake in south San Diego County. The proposed Project application includes amendments to the Otay Subregional Plan, Volume 2 ("Otay SRP"). The Otay SRP governs land uses and intensities of development permitted under the County General Plan for this Specific Plan Area (identified as Village 13 in the SRP). An amendment to the Otay SRP is a County General Plan Amendment (GPA).

Project Setting

The Otay Ranch Resort Village is located in the County of San Diego, in the Proctor Valley Parcel of the Otay SRP approximately one-quarter mile east of the City of Chula Vista. Access is provided via Telegraph Canyon Road which transitions into Otay Lakes Road, and forms the southern boundary of the Project site.

The proposed Project's approximate 1,869-acre planning area consists of a broad mesa sloping to the south, broken by several steep canyons draining from north to south. Portions of the relatively flat mesa extend north into the Jamul Mountains, becoming part of steeper slopes. Site elevations range from approximately 500 feet above mean sea level (AMSL) at the southern end of the property to approximately 1,500 feet AMSL in the northeastern portions. The project area lies within the watershed of the Otay River, a westerly flowing stream which drains an area of approximately 145 square miles. The site is upstream of Savage Dam, which creates Lower Otay Lake. The Otay Ranch Resort Village site vegetation consists of native coastal sage scrub and grassland habitats disturbed by grazing. Some riparian vegetation occurs in drainage areas of the site.

The proposed Project is located at the interface of urban development and scenic open space. The Otay Valley Parcel of Otay Ranch, the EastLake Vistas residential community, the EastLake Woods residential community, and the U.S. Olympic Training Center compose the edge of urban development to the west. Lower Otay Lake, a recreational reservoir and water supply owned by the City of San Diego, is located to the south. Upper Otay Lake and the Birch Family Estate are located to the northwest. A temporary ultra-light gliding and parachuting airport is located at the eastern end of the Lower Otay Lake on City of San Diego property. An inactive quarry operation is located further to the east.

Proposed Development Plan

The land uses proposed by the Otay Ranch Resort Village are defined in Table 1 (Otay Ranch Resort Village Land Use Summary). The proposed land uses consist of single-family neighborhoods, a mixed use residential and commercial use neighborhood, a resort hotel with associated ancillary facilities, an elementary school site, a site for public safety facilities, open space, Preserve land, and park and recreational uses.

- The proposed Project includes approximately 525.0 acres designated for 1,881 single-family detached homes. Five single-family neighborhoods are planned with average densities ranging from 3.2 to 4.4 dwelling units per acre.

- A multiple use neighborhood of 14.1 acres is proposed to contain 57 residential units in either an attached or detached configuration. The multiple use area includes up to 20,000 square feet of commercial uses.

- Approximately 17.4 acres are identified for a resort hotel complex with a maximum of 200 guest rooms and up to 20,000 square feet of ancillary uses including meeting rooms, a conference center, offices, shops, and restaurants.

- The Specific Plan proposes to reserve a 2.1-acre public safety site and a 10.0-acre elementary school site.

- Nine parks are planned on 28.6 acres, the largest of which is a 10.3 acre public neighborhood park site. The remaining parks range from 1.3 acres to 2.9 acres.

- The Otay Ranch Resort Village planning area also includes about 144 acres of open space and approximately 1,089 acres of preserve land. Open space generally consists of large manufactured slopes outside of neighborhoods and brush management areas. Preserve land is usually undisturbed lands or restored habitats set aside for dedication to the Otay Ranch Preserve Owner Manager in satisfaction of Otay Ranch RMP conveyance requirements.

- Internal circulation comprises about 39.0 acres of the planning area.

This analysis presented in this report addresses both the Project's proposed development scenario (as described above), and the optional development scenario, which would replace 20,000 square feet of commercial uses and 57 multi-family residential residences with 57 single-family residences.

Table 1
Otay Ranch Village 13 Land Use Summary Table

Land Use	Acres	Units
Single Family Residential[1]		
R-1	248.7	796
R-2	55.9	211
R-3	90.2	401
R-4	74.5	263
R-5	55.8	210
Single Family Total	525.0	1,881
Mixed Use		
MU[2]	14.1	57
Mixed Use Total	14.1	57
Residential Total	539.1	1,938
Parks		
P-1	2.9	
P-2	1.7	
P-3	2.3	
P-4	2.2	
P-5	10.3	
P-6	2.4	
P-7	2.9	
P-8	1.3	
P-9	2.6	
Parks Total	28.6	
Resort		
Resort[3]	17.4	
Resort Total	17.4	
Public Uses		
Public Safety	2.1	
Elementary School	10.0	
Public Uses Total	12.1	
Open Space & Preserve		
Open Space	143.9	
Preserve	1,089.0	
Open Space & Preserve Total	1,232.9	
Circulation		
Circulation	39.0	
Circulation Total	39.0	
TOTAL	**1,869.0**	**1,938**

[1] Single Family Residential includes residential streets and internal slopes.
[2] Multiple Use includes up to 20,000 square feet of commercial use.
[3] Resort includes up to 200 rooms and up to 20,000 sq. ft. of ancillary uses.
[4] Open Space includes manufactured slopes outside of neighborhoods and associated residential manufactured slopes.

1.1 General Principles and Existing Conditions

Global climate change (GCC) refers to changes in average climatic conditions on Earth as a whole, including temperature, wind patterns, precipitation and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), which are known as greenhouse gases (GHGs). These gases allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. Gases that trap heat in the atmosphere are often called greenhouse gases, analogous to a greenhouse. The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Without these natural GHGs, the Earth's temperature would be about 61º Fahrenheit cooler (California Environmental Protection Agency 2006). Emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere.

GCC may result from natural factors, natural processes, and/or human activities that change the composition of the atmosphere and alter the surface and features of land. Although the conceptual existence of GCC is generally accepted, the extent to which global climate change attributable to anthropogenic (human) emissions of GHGs (mainly CO_2, CH_4 and N_2O) is currently one of the most important and widely debated scientific, economic and political issues in the United States. Historical records indicate that global climate changes have occurred in the past due to natural phenomena (such as during previous ice ages). Some data indicate that the current global conditions differ from past climate changes in rate and magnitude. The State of California has been at the forefront of developing solutions to address potential anthropogenic impacts to GCC.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The IPCC concluded that a stabilization of GHGs at 400 to 450 ppm CO_2 equivalent concentration is required to keep global mean warming below 3.6º Fahrenheit (2º Celsius), which

is assumed to be necessary to avoid dangerous climate change (Association of Environmental Professionals 2007).

State law defines greenhouse gases as any of the following compounds: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) (California Health and Safety Code Section 38505(g). CO_2, followed by CH_4 and N_2O, are the most common GHGs that result from human activity.

1.2 Sources and Global Warming Potentials of GHG

As discussed further below, the sources of GHG emissions, GWP, and atmospheric lifetime of GHGs are all important variables to be considered in the process of calculating CO_2e for discretionary land use projects that require a climate change analysis.

The State of California GHG Inventory performed by the California Air Resources Board (ARB), compiled statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, CH_4, N_2O, SF_6, HFCs, and PFCs. The current inventory covers the years 1990 to 2012, and is summarized in Table 2. Data sources used to calculate this GHG inventory include state and federal agencies, international organizations, and industry associations. The calculation methodologies are consistent with guidance from the IPCC. The 1990 emissions level is the sum total of sources and sinks from all sectors and categories in the inventory. The inventory is divided into seven broad sectors and categories in the inventory. These sectors include: Agriculture; Commercial; Electricity Generation; Forestry; Industrial; Residential; and Transportation.

Table 2 State of California GHG Emissions by Sector				
Sector	**Total 1990 Emissions ($MMTCO_2e$)**	**Percent of Total 1990 Emissions**	**Total 2012 Emissions ($MMTCO_2e$)**	**Percent of Total 2012 Emissions**
Agriculture	23.4	5%	37.86	8%
Commercial	14.4	3%	14.20	3%
Electricity Generation	110.6	26%	95.09	21%
Forestry (excluding sinks)	0.2	<1%		
Industrial	103.0	24%	89.16	19%
Residential	29.7	7%	28.09	6%
Transportation	150.7	35%	167.38	36%
Recycling and Waste			8.49	2%
High GWP Gases			18.41	4%
Forestry Sinks	(6.7)			

When accounting for GHGs, all types of GHG emissions are expressed in terms of CO_2 equivalents (CO_2e) and are typically quantified in metric tons (MT) or millions of metric tons (MMT).

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the "cumulative radiative forcing effect of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas" (USEPA 2006). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main greenhouse gases that have been attributed to human activity include CH_4, which has a GWP of 28, and N_2O, which has a GWP of 265 (ARB 2014). Table 3 presents the GWP and atmospheric lifetimes of the GHGs that are regulated by the state of California.

Table 3 Global Warming Potentials and Atmospheric Lifetimes of GHGs			
GHG	**Formula**	**100-Year Global Warming Potential**	**Atmospheric Lifetime (Years)**
Carbon Dioxide	CO_2	1	Variable
Methane	CH_4	28	12
Nitrous Oxide	N_2O	265	121
Sulfur Hexafluoride	SF_6	23,500	3,200
Hydrofluorocarbons	HFCs	100 to 12,000	1 to 100
Perfluorocarbons	PFCs	7,000 to 11,000	3.000 to 50,000
Nitrogen Trifluoride	NF_3	16,100	500
Source: First Update to the Climate Change Scoping Plan, ARB 2014			

Human-caused sources of CO_2 include combustion of fossil fuels (coal, oil, natural gas, gasoline and wood). Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. Concentrations of CO_2 have increased in the atmosphere since the industrial revolution.

CH_4 is the main component of natural gas and also arises naturally from anaerobic decay of organic matter. Human-caused sources of natural gas include landfills, fermentation of manure and cattle farming. Human-caused sources of N_2O include combustion of fossil fuels and industrial processes such as nylon production and production of nitric acid.

Other GHGs are present in trace amounts in the atmosphere and are generated from various industrial or other uses.

In addition to the State of California GHG Inventory, a more specific regional GHG inventory was prepared by the University of San Diego School of Law Energy Policy Initiative Center, a non-regulatory, academic and research center (University of San Diego 2008). This San Diego County Greenhouse Gas Inventory (SDCGHGI) is a detailed inventory that takes into account the unique characteristics of the region in calculating emissions. The SDCGHGI calculated GHG emissions for 1990, 2006, and projected 2020 emissions.

Areas where feasible reductions can occur and the strategies for achieving those reductions are outlined in the SDCGHGI. A summary of the various sectors that contribute GHG emissions in San Diego County for the year 2006 is provided in Table 4. Total GHGs in San Diego County are estimated at 34 $MMTCO_2e$.

Table 4
San Diego County 2006 GHG Emissions by Category

Sector	Total Emissions ($MMTCO_2e$)	Percent of Total Emissions
On-Road Transportation	16	46%
Electricity	9	25%
Natural Gas Consumption	3	9%
Civil Aviation	1.7	5%
Industrial Processes & Products	1.6	5%
Other Fuels/Other	1.1	4%
Off-Road Equipment & Vehicles	1.3	4%
Waste	0.7	2%
Agriculture/Forestry/Land Use	0.7	2%
Rail	0.3	1%
Water-Born Navigation	0.13	0.4%

Source: EPIC's SDCGHGI, 2008.

According to the SDCGHGI, a majority of the region's emissions are attributable to on-road transportation, with the next largest source of GHG emissions attributable to electricity generation. Similarly, a majority of the emissions resulting from land development projects will be attributable to on-road transportation emissions. According to the SDCGHGI study, the emission reductions for on-road transportation will be achieved in a variety of ways, including through regulations aimed at increasing fuel efficiency standards and decreasing vehicle emissions. These regulations are outside the control of project applicants.

Similar to on-road emissions, the SDCGHGI indicated that the necessary emission reductions for electricity generation will be achieved in a variety of ways, including through implementation of the renewable portfolio standard (RPS), cleaner electricity purchases by San Diego Gas &

Electric, replacement of the Boardman Contract (which allows the purchase of electricity from coal-fired power plants), and implementation of 400 MW of photovoltaics. These measures are also outside the control of project applicants. The SDCGHGI indicates that reduction in electricity consumption of 10 percent would contribute to the required reduction in GHG emissions required to reduce emissions to 1990 levels by 2020.

1.3 Regulatory Framework

All levels of government have some responsibility for the protection of air quality, and each level (Federal, State, and regional/local) has specific responsibilities relating to air quality regulation. GHG emissions and the regulation of GHGs is a relatively new component of air quality.

1.3.1 National and International Efforts

GCC is being addressed at both the international and federal levels. In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis for human-induced climate change, its potential impacts, and options for adaptation and mitigation. The most recent reports of the IPCC have emphasized the scientific consensus that real and measurable changes to the climate are occurring, that they are caused by human activity, and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

On March 21, 1994, the United States joined a number of countries around the world in signing the United Nations Framework Convention on Climate Change (UNFCCC). Under the Convention, governments agreed to gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of GCC. Recently, the United States Supreme Court declared in the court case of Massachusetts et al. vs. the Environmental Protection Agency et al., 549 C.S. 497 (2007) that the EPA does have the

ability to regulate GHG emissions. In addition to the national and international efforts described above, many local jurisdictions have adopted climate change policies and programs.

Endangerment Finding. On April 17, 2009, EPA issued its proposed endangerment finding for GHG emissions. On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

> **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)--in the atmosphere threaten the public health and welfare of current and future generations.
>
> **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

The endangerment findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009.

Mandatory GHG Reporting Rule. On March 10, 2009, in response to the FY2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110–161), EPA proposed a rule that requires mandatory reporting of greenhouse gas (GHG) emissions from large sources in the United States. On September 22, 2009, the Final Mandatory Reporting of Greenhouse Gases Rule was signed, and was published in the Federal Register on October 30, 2009. The rule became effective on December 29, 2009. The rule will collect accurate and comprehensive emissions data to inform future policy decisions.

EPA is requiring suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions to submit annual reports to EPA. The gases covered by the proposed rule are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF_6), and other fluorinated gases including nitrogen trifluoride (NF_3) and hydrofluorinated ethers (HFE).

Corporate Average Fuel Economy Standards. The federal Corporate Average Fuel Economy (CAFE) standard determines the fuel efficiency of certain vehicle classes in the United States. In 2007, as part of the Energy and Security Act of 2007, CAFE standards were increased for new light-duty vehicles to 35 miles per gallon by 2020. In May 2009, President Obama announced plans to increase CAFE standards to require light-duty vehicles to meet an average fuel economy of 35.5 miles per gallon by 2016.On April 1, 2010, the U.S. Department of Transportation and the EPA established historic new federal rules that set the first-ever national greenhouse gas emissions standards and will significantly increase the fuel economy of all new passenger cars and light trucks sold in the United States. The standards set a requirement to meet an average fuel economy of 34.1 miles per gallon by 2016.

1.3.2 State Regulations and Standards

The following subsections describe regulations and standards that have been adopted by the State of California to address GCC issues.

Assembly Bill 32, the California Global Warming Solutions Act of 2006. In September 2006, Governor Schwarzenegger signed California AB 32, the global warming bill, into law. AB 32 directs the ARB to do the following:

- Make publicly available a list of discrete early action GHG emission reduction measures that can be implemented prior to the adoption of the statewide GHG limit and the measures required to achieve compliance with the statewide limit.
- Make publicly available a GHG inventory for the year 1990 and determine target levels for 2020.

- On or before January 1, 2010, adopt regulations to implement the early action GHG emission reduction measures.
- On or before January 1, 2011, adopt quantifiable, verifiable, and enforceable emission reduction measures by regulation that will achieve the statewide GHG emissions limit by 2020, to become operative on January 1, 2012, at the latest. The emission reduction measures may include direct emission reduction measures, alternative compliance mechanisms, and potential monetary and non-monetary incentives that reduce GHG emissions from any sources or categories of sources that ARB finds necessary to achieve the statewide GHG emissions limit.
- Monitor compliance with and enforce any emission reduction measure adopted pursuant to AB 32.

AB 32 required that by January 1, 2008, ARB determine what the statewide GHG emissions level was in 1990, and approve a statewide GHG emissions limit that is equivalent to that level, to be achieved by 2020. ARB adopted its Scoping Plan in December 2008, which provided estimates of the 1990 GHG emissions level and identified sectors for the reduction of GHG emissions. The ARB has recently published an update to the Scoping Plan (ARB 2014). The ARB has estimated that the 1990 GHG emissions level was 427 MMT net CO_2e (ARB 2007b). The ARB initially estimated that a reduction of 169 MMT net CO_2e emissions below business-as-usual would be required by 2020 to meet the 1990 levels (ARB 2008).This estimate was updated in the 2011 *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* (ARB 2011a) based on new economic data and the incorporation of certain existing regulatory standards. Based upon the update, the ARB determined in the 2011 Supplement that the State is projected to emit 507 MMT CO_2e in 2020, and that a reduction of 80 MMT would be required by 2020 in order to return to the 1990 levels. The 80 MMT reduction correlates to a 16% reduction in GHG emissions.

Senate Bill 97. Senate Bill 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directs OPR to develop draft CEQA guidelines "for the mitigation of greenhouse gas

emissions or the effects of greenhouse gas emissions" by July 1, 2009 and directs the Resources Agency to certify and adopt the CEQA guidelines by January 1, 2010.

The Governor's Office of Planning and Research (OPR) published a technical advisory on CEQA and Climate Change on June 19, 2008. The guidance did not include a suggested threshold. The OPR does recommend that CEQA analyses include the following components:

- Identify greenhouse gas emissions
- Determine Significance
- Mitigate Impacts

In April 2009, the OPR published its proposed revisions to CEQA to address GHG emissions. The amendments to CEQA indicate the following:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.
- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.
- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.
- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix F of the CEQA Guidelines.

- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation."
- OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.
- Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential.

On July 3, 2009, the California Natural Resources Agency published proposed amendment of regulations based on OPR's proposed revisions to CEQA to address GHG emissions. On that date, the Natural Resources Agency commenced the Administrative Procedure Act rulemaking process for certifying and adopting these amendments pursuant to Public Resources Code section 21083.05. Having reviewed and considered all comments received, on December 30, 2009, the Natural Resources Agency adopted the proposed amendments to the state CEQA guidelines in the California Code of Regulations. The amendments were formally adopted on March 18, 2010.

Executive Order S-3-05. Executive Order S-3-05, signed by Governor Schwarzenegger on June 1, 2005, calls for a reduction in GHG emissions to 1990 levels by 2020 and for an 80 percent reduction in GHG emissions by 2050. Executive Order S-3-05 also calls for the California EPA (CalEPA) to prepare biennial science reports on the potential impact of continued GCC on certain sectors of the California economy. The first of these reports, "Our Changing Climate: Assessing Risks to California", and its supporting document "Scenarios of Climate Change in California: An Overview" were published by the California Climate Change Center in 2006.

Executive Order S-21-09. Executive Order S-21-09 was enacted by the Governor on September 15, 2009. Executive Order S-21-09 requires that the ARB, under its AB 32 authority, adopt a regulation by July 31, 2010 that sets a 33 percent renewable energy target as established in Executive Order S-14-08. Under Executive Order S-21-09, the ARB will work with the

Public Utilities Commission and California Energy Commission to encourage the creation and use of renewable energy sources, and will regulate all California utilities. The ARB will also consult with the Independent System Operator and other load balancing authorities on the impacts on reliability, renewable integration requirements, and interactions with wholesale power markets in carrying out the provisions of the Executive Order. The order requires the ARB to establish highest priority for those resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health.

California Code of Regulations Title 24. Although not originally intended to reduce greenhouse gas emissions, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The GHG emission inventory was based on Title 24 as of 2008.. According to the California Energy Commission (CEC 2012), the California Energy Commission's (CEC) 2013 Building Energy Efficiency Standards (effective July 1, 2014) are 25 percent and 30 percent more efficient than the 2008 Title 24standards for residential and nonresidential construction, respectively. The 2013 standards require higher efficiency windows, insulation, lighting, ventilation systems and other features that further reduce energy consumption in homes and businesses. Additionally, the Standards will save 200million gallons of water per year (equal to more than 6.5million wash loads) and avoid 170,500 tons of greenhouse gas emissions per year. Energy efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in greenhouse gas emissions. Therefore, increased energy efficiency results in decreased greenhouse gas emissions.

State Standards Addressing Vehicular Emissions. California Assembly Bill 1493 (Pavley) enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light duty trucks. Regulations adopted by ARB would apply to 2009 and later model year vehicles. ARB estimated that the regulation would reduce climate change emissions from light duty passenger vehicle fleet by an estimated

18% in 2020 and by 27% in 2030 (AEP 2007). Once implemented, emissions from new light-duty vehicles are expected to be reduced in San Diego County by 21 percent by 2020. The ARB has adopted amendments to the "Pavley" regulations that reduce greenhouse gas (GHG) emissions in new passenger vehicles from 2009 through 2016. The amendments, approved by the Board on September 24, 2009, are part of California's commitment toward a nation-wide program to reduce new passenger vehicle GHGs from 2012 through 2016. ARB's September 2009 amendments will cement California's enforcement of the Pavley rule starting in 2009 while providing vehicle manufacturers with new compliance flexibility. The amendments will also prepare California to harmonize its rules with the federal rules for passenger vehicles. It is expected that the Pavley regulations will reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016, all while improving fuel efficiency.

Implementation of the Pavley II standards will commence in 2017 and cover vehicles manufactured from 2017 through 2025. Based on information from the ARB (ARB 2011b), the Pavley II program (now referred to as the "Advanced Clean Cars" program) would reduce GHG emissions from the fleet by 3% by 2020, and by 12% by 2025, with continuing reductions in emissions of 27% by 2035 and 33% by 2050.

Executive Order S-01-07. Executive Order S-01-07 was enacted by the Governor on January 18, 2007. Essentially, the order mandates the following: 1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020; and 2) that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California. It is assumed that the effects of the LCFS would be a 10% reduction in GHG emissions from fuel use by 2020. On April 23, 2009, ARB adopted regulations to implement the LCFS.

Senate Bill 375. Senate Bill 375 requires that regions within the state which have a metropolitan planning organization must adopt a sustainable communities strategy as part of their regional transportation plans. The strategy must be designed to achieve certain goals for the reduction of GHG emissions. The bill finds that GHG from autos and light trucks can be substantially

reduced by new vehicle technology, but even so "it will be necessary to achieve significant additional greenhouse gas reductions from changed land use patterns and improved transportation. Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 provides that new CEQA provisions be enacted to "encourage developers to submit applications and local governments to make land use decisions that will help the state achieve its goals under AB 32," and that "current planning models and analytical techniques used for making transportation infrastructure decisions and for air quality planning should be able to assess the effects of policy choices, such as residential development patterns, expanded transit service and accessibility, the walkability of communities, and the use of economic incentives and disincentives."

The Sustainable Communities and Climate Protection Act of 2008 (SB 375) coordinates land use planning, regional transportation plans, and funding priorities to reduce GHG emissions from passenger vehicles through better-integrated regional transportation, land use, and housing planning that provides easier access to jobs, services, public transit, and active transportation options.SB 375 specifically requires the Metropolitan Planning Organization (MPO) relevant to the Project area (here, the San Diego Association of Governments [SANDAG]) to include a Sustainable Communities Strategy in its Regional Transportation Plan that will achieve GHG emission reduction targets set by the ARB by reducing vehicle miles traveled from light-duty vehicles through the development of more compact, complete, and efficient communities.

For the area under SANDAG's jurisdiction, including the Project Site, the ARB adopted regional targets for reduction of mobile source-related GHG emissions by 7 percent for 2020 and by 13 percent for 2035. (These targets are expressed by the ARB as a percent change in per capita GHG emissions relative to 2005 levels.) In October 2011, SANDAG's Board adopted its 2050 Regional Transportation Plan and Sustainable Communities Strategy. Subsequently, in November 2011, the ARB - by resolution – accepted SANDAG's GHG emissions quantification analysis and determination that, if implemented, the Sustainable Communities Strategy would achieve the ARB's 2020 and 2035 GHG emission reduction targets for the region.

Pursuant to Government Code Section 65080(b)(2)(K), SANDAG's Sustainable Communities Strategy does not: (i) regulate the use of land; (ii) supersede the land use authority of cities and counties; or (iii) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing Sustainable Communities Strategy as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

1.3.3 Local Regulations and Standards

The County has adopted its General Plan Update (County of San Diego 2011), which provides smart growth and land use planning principles designed to reduce vehicle miles traveled (VMT) and result in a reduction in GHG emissions. As discussed in the General Plan Update, climate change and GHG reduction policies are addressed in plans and programs in multiple elements of the General Plan. The strategies for reduction of GHG emissions in the General Plan Update are as follows:

- Strategy A-1: Reduce vehicle trips generated, gasoline/energy consumption, and greenhouse gas emissions.
- Strategy A-2: Reduce non-renewable electrical and natural gas energy consumption and generation (energy efficiency).
- Strategy A-3: Increase generation and use of renewable energy sources.
- Strategy A-4: Reduce water consumption.
- Strategy A-5: Reduce and maximize reuse of solid wastes.
- Strategy A-6: Promote carbon dioxide consuming landscapes.
- Strategy A-7: Maximize preservation of open spaces, natural areas, and agricultural lands.

The General Plan Update also includes climate adaptation strategies to deal with potential adverse effects of climate change. The climate adaptation strategies include the following:

- Strategy B-1: Reduce risk from wildfire, flooding, and other hazards resulting from climate change.

- Strategy B-2: Conserve and improve water supply due to shortages from climate change.
- Strategy B-3: Promote agricultural lands for local food production.
- Strategy B-4: Provide education and leadership.

The County has also implemented a number of outreach programs such as the Green Building Program, lawn mower trade-in program, and reduction of solid waste by recycling to reduce air quality impacts as well as GHG emissions.

The County General Plan's Conservation and Open Space Element includes policies that are designed to reduce the emissions of criteria air quality pollutants, emissions of greenhouse gases, and energy use in buildings and infrastructure, while promoting the use of renewable energy sources, conservation, and other methods of efficiency. The proposed Project is consistent with the following applicable General Plan Goals, as described in Appendix B of the proposed Project's Draft EIR.

- General Plan Goal COS-1, Inter-Connected Preserve System
- General Plan Goal COS-2, Sustainability of the Natural Environment
- General Plan Goal COS-14, Sustainable Land Development
- General Plan Goal COS-15, Sustainable Architecture and Buildings
- General Plan Goal COS-16, Sustainable Mobility
- General Plan Goal COS-17, Sustainable Solid Waste Management
- General Plan Goal COS-18, Sustainable Energy
- General Plan Goal COS-19, Sustainable Water Supply

2.0 POTENTIAL CLIMATE CHANGE IMPACTS TO PROJECT SITE

2.1 Existing Conditions

The site is currently undeveloped and includes disturbed areas and native vegetation, consisting mainly of coastal sage scrub and grassland. Natural vegetation and soils temporarily store carbon as part of the terrestrial carbon cycle. Carbon is assimilated into plants and animals as they grow and then dispersed back into the environment when they die. There are two existing sources of carbon storage at the Project site: natural vegetation and soils. It is difficult to assess net changes in carbon storage associated with the proposed Project, but carbon sequestration rates for native vegetation in the Otay Ranch region are relatively low in comparison to heavily vegetated areas such as forests. For example, according to the U.S. EPA (http://www.epa.gov/sequestration/rates.html), riparian areas are estimated to sequester from 0.1 to 0.3 metric tons of CO_2e per acre per year in comparison to forests, which are estimated to sequester 0.6 to 2.6 metric tons of CO_2e per acre per year. Native vegetation in the Otay Ranch region, which consists mainly of scrub, would be expected to provide a low level of carbon sequestration. The key issue is the balance between the loss of natural vegetation and future carbon storage associated with landscaping. The situation is further complicated by changes in fire regime. Carbon in natural vegetation is likely to be released into the atmosphere through wildfire every 20 to 150 years. Carbon in landscaped areas will be protected from wildfire. The balance between these factors will influence the long-term carbon budget on the site.

The majority of carbon within the site is stored in the soil. Soil carbon accumulates from inputs of plant and animal matter, roots, and other living components of the soil ecosystem (e.g., bacteria, worms, etc.). Soil carbon is lost through biological respiration, erosion, and other forms of disturbance. Overall, soil carbon moves more slowly through the carbon cycle, and it offers greater potential for long-term carbon storage. Field observations suggest that urban soils can sequester relatively large amounts of carbon. Observations from across the United States suggest that warmer and drier climates (such as southern California) may have slightly higher soil organic matter levels when compared to equivalent areas before development.

Based on the site's current conditions and the absence of development, existing GHG emissions are negligible and assumed to be zero.

2.2 Typical Adverse Effects

The Climate Scenarios Report (CCCC 2006), uses a range of emissions scenarios developed by the IPCC to project a series of potential warming ranges (i.e., temperature increases) that may occur in California during the 21st century. Three warming ranges were identified: Lower warming range (3.0 to 5.5 degrees Fahrenheit (ºF)); medium warming range (5.5 to 8.0 ºF); and higher warming range (8.0 to 10.5ºF). The Climate Scenarios Report then presents an analysis of the future projected climate changes in California under each warming range scenario.

According to the report, substantial temperature increases would result in a variety of impacts to the people, economy, and environment of California. These impacts would result from a projected increase in extreme conditions, with the severity of the impacts depending upon actual future emissions of GHGs and associated warming. These impacts are described below.

Public Health. Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to O_3 formation are projected to increase by 25 to 35 percent under the lower warming range and 75 to 85 percent under the medium warming range. In addition, if global background O_3 levels increase as is predicted in some scenarios, it may become impossible to meet local air quality standards. An increase in wildfires could also occur, and the corresponding increase in the release of pollutants including $PM_{2.5}$ could further compromise air quality. The Climate Scenarios Report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

Potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and

heat-related problems (e.g., heat rash and heat stroke). In addition, climate sensitive diseases (such as malaria, dengue fever, yellow fever, and encephalitis) may increase, such as those spread by mosquitoes and other disease-carrying insects.

Potential public health impacts from climate change would be global in nature rather than site-specific. That being said, because the project site is not located in an area that is subject to climate sensitive diseases (such as the tropics), it is unlikely that risks associated with these diseases would increase substantially. It is too speculative to estimate the potential frequency of heat waves at the project site that would be associated with global climate change.

Water Resources. A vast network of reservoirs and aqueducts capture and transport water throughout the State from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada mountain snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages. In addition, if temperatures continue to rise more precipitation would fall as rain instead of snow, further reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. The State's water resources are also at risk from rising sea levels. An influx of seawater would degrade California's estuaries, wetlands, and groundwater aquifers.

Impacts to water resources could affect the project site through decreased availability of water in southern California overall. Decreased availability could lead to higher prices and water rationing. However, due to the scientific and factual uncertainties regarding the effects of climate change at a regional level, it is too speculative to quantify the effect of this impact. Nonetheless, reference should be made to the EIR's water supply analysis for further information.

Agriculture. Increased GHG and associated increases in temperature are expected to cause widespread changes to the agricultural industry, reducing the quantity and quality of agricultural products statewide. Significant reductions in available water supply to support agriculture would

also impact production. Crop growth and development will change as will the intensity and frequency of pests and diseases.

This potential effect of climate change would not impact the proposed project because the project does not involve agricultural uses.

Ecosystems/Habitats. Continued global warming will likely shift the ranges of existing invasive plants and weeds, thus alternating competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Continued global warming is also likely to increase the populations of and types of pests. Continued global warming would also affect natural ecosystems and biological habitats throughout the State.

Due to the scientific and factual uncertainties regarding the effects of climate change at a regional and site-specific level, particularly as to sensitive biological resources, it is too speculative to assess the effect of this impact on the project site. Nonetheless, reference should be made to the EIR's analysis of biological resources for further information.

Wildland Fires. Global warming is expected to increase the risk of wildfire and alter the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the State.

The project site generally has a low potential for fire risks due to the type of on-site native vegetation. If fire risks do increase due to global climate change, the project has developed a fire protection plan (January 2015) that will protect the site and minimize hazards arising from wildland fires.

Sea Level Rising and Coastal Flooding. Rising sea levels, more intense coastal storms, and warmer water temperatures will increasing threaten the State's coastal regions. Under the high warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. A sea level risk of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten levees and inland water systems, and disrupt wetlands and natural habitats.

Because the site is not located in a coastal area, it is unlikely to be affected by rising sea levels.

2.3 California Climate Adaptation Strategy

As part of its climate change planning process, the California Natural Resources Agency prepared its California Climate Adaptation Strategy (CNRA 2009) to summarize the best known science on climate change impacts in California, with the goal of assessing vulnerability to climate change impacts. According to the ARB, some of the potential California-specific impacts of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. To protect the State's public health and safety, resources, and economy, the California Natural Resources Agency—in coordination with other state agencies—has updated the *2009 California Climate Adaptation Strategy* that is titled, *Safeguarding California: Reducing Climate Risk*. The final *Safeguarding California* plan is dated July 2014, and provides policy guidance for state decision makers relative to climate risks in nine sectors: agriculture; biodiversity and habitat; emergency management; energy; forestry; ocean and coastal ecosystems and resources; public health; transportation; and water. It also identifies policies for reducing GHG emissions and accelerating the transition to a clean-energy economy through reductions in emissions, readiness, and continued research.

The California Climate Adaptation Strategy takes into account the long-term, complex, and uncertain nature of climate change and establishes a proactive foundation for an ongoing adaptation process. The strategy made preliminary recommendations as a first step in addressing responses to impacts of global climate change within the state. Key recommendations include:

1. A Climate Adaptation Advisory Panel (CAAP) will be appointed to assess the greatest risks to California from climate change and recommend strategies to reduce those risks building on California's Climate Adaptation Strategy.
2. Identify necessary changes to California's water management and uses.
3. Consider project alternatives that avoid significant new development in areas that cannot be adequately protected (planning, permitting, development, and building) from flooding, wildfire and erosion due to climate change.
4. All state agencies responsible for the management and regulation of public health, infrastructure or habitat subject to significant climate change should prepare as appropriate agency-specific adaptation plans, guidance, or criteria by September 2010.
5. To the extent required by CEQA Guidelines Section 15126.2, all significant state projects, including infrastructure projects, must consider the potential impacts of locating such projects in areas susceptible to hazards resulting from climate change.
6. The California Emergency Management Agency (Cal EMA) will collaborate with the California Natural Resources Agency, the Climate Action Team, the Energy Commission, and the CAAP to assess California's vulnerability to climate change, identify impacts to state assets, and promote climate adaptation/mitigation awareness through the Hazard Mitigation Web Portal and My Hazards Website as well as other appropriate sites.
7. Using existing research the state should identify key California land and aquatic habitats that could change significantly during this century due to climate change. Based on this identification, the state should develop a plan for expanding existing protected areas or altering land and water management practices to minimize adverse effects from climate change induced phenomena.
8. The best long-term strategy to avoid increased health impacts associated with climate change is to ensure communities are healthy to build resilience to increased spread of disease and temperature increases.
9. Communities with General Plans and Local Coastal Plans should begin, when possible, to amend their plans to assess climate change impacts, identify areas most vulnerable to these impacts, and develop reasonable and rational risk reduction strategies using the CAS as guidance.

10. State fire fighting agencies should begin immediately to include climate change impact information into fire program planning to inform future planning efforts.
11. State agencies should meet projected population growth and increased energy demand with greater energy conservation and an increased use of renewable energy.
12. Existing and planned climate change research can and should be used for state planning and public outreach purposes; new climate change impact research should be broadened and funded.

3.0 CLIMATE CHANGE SIGNIFICANCE CRITERIA

According to Appendix G of the CEQA Guidelines, the following criteria are considered to establish a significance threshold for GCC impacts:

Would the project:

- Generate greenhouse gas 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 greenhouse gases?

This GHG analysis has been based on the County's 2015 GHG Guidance, which requires an evaluation of whether the project would conform with the GHG reduction targets set forth in the 2011 *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* (ARB 2011a). Based on the County's Guidance and the 2011 Supplement, a 16% reduction in GHG emissions would be required to meet the target of reducing emissions to 1990 levels by 2020.

In addition to the 16% reduction identified in the 2011 Supplement and utilized in the County's 2015 GHG Guidance, other agencies with expertise have identified other potential methodologies by which to assess the significance of a project's GHG emissions. The Bay Area Air Quality Management District developed GHG thresholds after reviewing three years of historical permit and emissions data, including a threshold of 4.6 metric tons of CO_2e per service population for land development projects (BAAQMD 2011). The South Coast Air Quality Management District's staff also has developed a draft threshold of 4.8metric tons of CO_2e per service population (SCAQMD 2010). The San Luis Obispo Air Pollution Control District adopted a threshold of 4.9 metric tons of CO_2e per year for land use development projects (SLOAPCD 2012).The San Joaquin Valley Air Pollution Control District has established a threshold of 29 percent reduction below business-as-usual (BAU) levels based on the ARB's 2008 Scoping Plan (SJVAPCD 2009). The Sacramento Metropolitan Air Quality Management District established a threshold of 21.7 percent reduction from BAU levels based on the 2011

Supplement, and has indicated that only a 15.3 percent reduction from BAU levels would be required based on the 2014 Update (SMAQMD 2014).

4.0 GREENHOUSE GAS INVENTORY

GHG emissions associated with the proposed Project were estimated separately for six categories of emissions: (1) construction; (2) area sources; (3) energy use, including electricity and natural gas usage; (4) water consumption; (5) solid waste handling; and (6) transportation. This inventory assumes that the proposed Project is constructed and operated consistent with the parameters of the ARB's 2011 Supplement and the County's 2015 GHG Guidance. A summary of the assumptions used to calculate the emissions for the unmitigated case are presented in Table A-1 in Appendix A.

The complete emissions inventory is summarized below and included in Appendix A.

4.1 Existing Greenhouse Gas Emissions

As discussed in Section 2.1, the site is currently undeveloped and existing site GHG emissions are negligible. Minor amounts of GHG emissions may be associated with intermittent on-site activities (e.g., vehicle use). However, this analysis assumes that the existing emission levels are zero.

4.2 Construction Greenhouse Gas Emissions

Construction GHG emissions include emissions from heavy construction equipment, truck traffic, and worker trips. Emissions were calculated using the CalEEMod Model, based on the anticipated construction schedule to full buildout. The County Department of Planning and Development Service (PDS) follows recommendations by the SCAQMD for purposes of evaluating construction-related GHGs under CEQA (SCAQMD 2008). Specifically, the County PDS recommends that the emissions be amortized over 30 years and added to operational emissions, as appropriate. Amortized over 30 years, construction would contribute 977 metric tons per year of CO_2e emissions. While the County's draft guidance indicates that construction emissions should be amortized over 20 years, given that Project construction would extend over an 11-year period, and the project would not be fully occupied until full buildout, it is appropriate to use a 30-year horizon for amortizing the construction emissions due to the size

and scope of this project. Furthermore, the project's lifespan would be longer than 30 years, as it is anticipated that the project would be occupied well beyond 2050. These emissions were added to the operational GHG emissions to evaluate their significance.

4.3 Operational Greenhouse Gas Emissions

Operational GHG emissions were calculated using the CalEEMod Model, with adjustments to account for site-specific conditions.

Area Source Emissions. The CalEEMod Model calculates emissions associated with area sources, including landscaping equipment and hearth (fireplace) use. For this analysis, it was assumed that all residential units would include a fireplace, and that fireplaces would be natural gas. Fireplaces were modeled based on average use for 30 days per year. This assumption is similar to the default value for the SCAQMD within CalEEMod, which assumes that fireplaces would operate 25 days per year. This is an appropriate assumption for southern California.

Energy Use Emissions. Energy use generates GHG through emissions from power plants that generate electricity as well as emissions from natural gas usage at the facility itself.

For purposes of estimating the GHG emissions for the Project without its PDFs relative to the assumptions utilized by the ARB in the 2011 Supplement, it was assumed the Project would meet the requirements of Title 24 as of 2008. To account for implementation of the 20% Renewable Portfolio Strategy, the energy intensity factors for utility natural gas combustion were adjusted to reflect renewable energy use. The energy intensity factors were adjusted by a factor of 14% to account for the renewable energy use of 6% as reported in the SDCGHGI (USD 2008).

Emissions were calculated using the CalEEMod Model (ENVIRON 2013), based on default energy use emission factors for the land uses proposed for the project. To adjust for the larger size of single-family residences proposed for the project, it was assumed that the single-family

would be 3,300 square feet. The energy use emissions for the remaining land uses were based on default values within the model.

Water. Water use and energy use are often closely linked. The provision of potable water to commercial users consumes large amounts of energy associated with five stages: source and conveyance, treatment, distribution, end use, and wastewater treatment. GHG emissions from water use were calculated based on the CalEEMod model default values.

Solid Waste. The disposal of solid waste produces GHG emissions from anaerobic decomposition in landfills, incineration, transportation of waste, and disposal. Solid waste generation rates were estimated from CalEEMod Model, and GHG emissions from solid waste management were estimated using the model, assuming landfilling of solid waste with flaring.

Transportation. Several regulatory initiatives have been passed to reduce emissions from on-road vehicles, as discussed in Section 1.3. For the purpose of calculating emissions for the Project without its PDFs relative to the assumptions utilized by the ARB in the 2011 Supplement, no credit was taken for implementation of the Pavley II standards, or the LCFS.

The EMFAC2011 model was run for the San Diego Air Basin using an average vehicle speed of 30 mph (the default speed in the CalEEMod Model). The EMFAC2011 model provides estimates of CO_2e without implementation of ARB greenhouse gas regulations, and CO_2e with implementation of the Pavley I and LCFS regulations. The ARB's 2011 Supplement assumes implementation of Pavley I, but not the LCFS. It was therefore assumed that the LCFS would account for a 10% reduction in CO_2e emissions. Based on the EMFAC2011 model outputs, the Pavley I regulations account for an additional 14.15% reduction in GHG emissions by 2020. This reduction is based on the EMFAC2011 emission factors (included in Appendix A), which provide emission factors for unmitigated and Pavley I + LCFS for CO_2. Because the 2011 Supplement is based on implementation of Pavley I but not the LCFS, and because the EMFAC2011 emission factors demonstrate that emissions are reduced by 10% for implementation of the LCFS, the reduction for implementation of Pavley I was calculated by removing the 10% reduction for the LCFS from the emission factors provided by the

EMFAC2011 model. CO_2e emissions were therefore reduced by 14.15% from levels without the ARB regulations to account for implementation of the Pavley I standards.

To calculate emissions associated with vehicle trips generated by the proposed Project, the trip generation rates from the Traffic Impact Study – Otay Ranch Resort Village Project (Chen Ryan 2014) were used. To evaluate project trips, the total trip generation rate of 27,191 ADT for buildout conditions was used. Vehicle miles traveled (VMT) were calculated based on the CalEEMod Model assumptions.

Based on these distances and trip distributions calculated by the CalEEMod Model, the total annual VMT is 68,001,666.

The results of the inventory conducted pursuant to the County's 2015 GHG Guidance are presented in Table 5a for the proposed Project, and Table 5b for the optional development scenario.

Table 5a
SUMMARY OF ESTIMATED PROJECT EMISSIONS
PER THE COUNTY'S 2015 GHG GUIDANCE

Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Source	582	0.0333	0.0102	586
Electricity Use	5,337	0.2226	0.0597	5,359
Natural Gas Use	3,793	0.0727	0.0696	3,813
Water Consumption	934	4.5256	0.1159	1,091
Solid Waste Handling	508	30.0495		1,349
Vehicles	28,790	1.0195	-	28,821
Amortized Construction	977			977
Total	**40,921**	**36.0132**	**0.2554**	41,997
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	40,921	1,008	68	41,997
TOTAL CO_2 Equivalent Emissions	**41,997**			

Table 5b SUMMARY OF ESTIMATED PROJECT EMISSIONS PER THE COUNTY'S 2015 GHG GUIDANCE OPTIONAL DEVELOPMENT SCENARIO				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Source	582	0.0337	0.0102	586
Electricity Use	5,303	0.2214	0.0596	5325
Natural Gas Use	3,833	0.0735	0.0703	3854
Water Consumption	925	4.477	0.1148	1081
Solid Waste Handling	512	30.2847	0.0000	1360
Vehicles	27,330	1.0718	-	27,360
Amortized Construction	977	-	-	977
Total	**39,462**	**36.1621**	**0.2549**	**40,542**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	39,462	1,012	68	40,542
TOTAL CO_2 Equivalent Emissions	**40,542**			

In addition to evaluating the project's GHG emissions under the County's 2015 GHG Guidance, the project's consistency with the Sacramento Metropolitan Air Quality Management District's adopted reduction threshold of 21.7% below "no action taken" conditions (hereinafter referred to as "business as usual" [BAU]) was evaluated. Under BAU conditions, it was assumed that the 20% Renewable Portfolio Standard would be implemented to reduce indirect emissions from electricity use. The CalEEMod Model was used to calculate emissions, with adjustments to account for this measure. In accordance with SMAQMD methodology, the BAU condition was assumed not to include vehicle GHG emission standards, and the "no action taken" scenario assumes Title 24 as of 2005.

Under Project conditions, it was assumed that, in addition to the regulatory measures listed for the BAU condition, the following regulatory measures would be implemented:

- Pavley I Standards – 14.15% reduction for light-duty vehicles.]
- Low Carbon Fuel Standard – 10% reduction in emissions from vehicles

- Advanced Clean Cars – 3% reduction by 2020
- Renewable Portfolio Standard – 33% renewable
- Title 24 as of 2013 – Single family residential: 36.4% reduction in electricity use, 6.5% reduction in natural gas use; multi-family residential: 23.3% reduction in electricity use, 3.8% reduction in natural gas use; nonresidential: 21.8% reduction in electricity use, 16.8% reduction in natural gas use.
- Solar Panels – 30% offset to Project's overall electricity usage

SMAQMD's CEQA Guide provides that a 21.7 percent reduction in GHG emissions from the BAU condition is substantial evidence of consistency with AB 32. Tables 6a and 6b present the SMAQMD BAU condition for the proposed Project and the optional development scenario.

Table 6a
SUMMARY OF ESTIMATED PROJECT EMISSIONS
PER THE SMAQMD GUIDANCE

Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Source	582	0.0333	0.0102	586
Electricity Use	5,486	0.2291	0.0617	5,509
Natural Gas Use	4,054	0.0777	0.0743	4,076
Water Consumption	934	4.5256	0.1159	1,091
Solid Waste Handling	508	30.0495	0	1,349
Vehicles	32,744	1.1331	0	32,776
Amortized Construction	977	0	0	977
Total	**45,285**	**36.0483**	**0.2621**	**46,364**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	40,536	1,009	69	46,364
TOTAL CO_2 Equivalent Emissions	**46,364**			

Table 6b SUMMARY OF ESTIMATED PROJECT EMISSIONS PER THE SMAQMD GUIDANCE OPTIONAL DEVELOPMENT SCENARIO				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Source	582	0.0333	0.0102	586
Electricity Use	5,449	0.2275	0.0613	5,472
Natural Gas Use	4,099	0.0786	0.0751	4,121
Water Consumption	925	4.4763	0.1146	1,081
Solid Waste Handling	512	30.2847	0.0000	1,360
Vehicles	31,090	1.0722	0	31,120
Amortized Construction	977	0	0	977
Total	43,634	36.1726	0.2612	44,716
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	43,634	1,013	69	44,716
TOTAL CO_2 Equivalent Emissions	**44,716**			

5.0 SUMMARY OF PROJECT DESIGN FEATURES AND IMPACTS

5.1 Project Greenhouse Gas Emissions

The following is a summary of the specific project design features (PDFs) that would be implemented by the proposed Project as conditions of approval of the Specific Plan and Tentative Maps, all of which are designed to reduce GHG emissions. Table 7 presents the project design features that reduce GHG emissions.

Table 7
Proposed Project Design Features to Reduce GHG Emissions

Strategy to Reduce GHG Emissions	Description	Emission Reduction	Basis for Emission Reduction
Land Use and Community Design			
Pedestrian Oriented Development	The Otay Ranch Resort Village land use plan locates a school, parks, and commercial land uses in proximity to residential areas to encourage pedestrian and bicycle travel as an alternative to the automobile. In addition, the Resort Village Trail and Pathway system provide alternate routes to these destinations.	Conservatively, no credit was taken for mixed uses at the site.	CAPCOA White Paper, Appendix B
Street Widths, Pavement and Street Trees	The Otay Ranch Resort Village land use plan includes narrow streets and reduced paving, which reduces heat buildup and the demand for air conditioning. Street trees also are included in the land use plan in order to provide shade that further reduces ambient air temperatures.	No reduction assumed.	CAPCOA White Paper, Appendix B
Transit Facilities and Alternative Transportation Modes			
Public Transportation	The applicant or designee will coordinate with the Chula Vista Transit (CVT) and the San Diego Association of Governments (SANDAG) to evaluate the feasibility of providing bus service to the site. Currently, CVT provides bus service through the Chula Vista Eastern Territories including the Eastlake Business Center and nearby Southwestern College.	No reduction assumed.	CAPCOA White Paper, Appendix B
Transportation Demand Management	The applicant or designee shall develop a transportation demand management program to ensure ridesharing and carpooling for residents and employees.	No reduction assumed.	N/A
Alternative Travel Modes	Otay Ranch Resort Village streets will provide for a maximum travel speed of 30	No reduction assumed.	CAPCOA White Paper, Appendix

Table 7
Proposed Project Design Features to Reduce GHG Emissions

Strategy to Reduce GHG Emissions	Description	Emission Reduction	Basis for Emission Reduction
	miles per hour, which allows the streets to be used by electric carts and bicycles.		B
Alternative Travel Modes	Off-street pathways and trails in the Resort Village will accommodate pedestrian and bicycle travel.	No reduction assumed.	CAPCOA White Paper, Appendix B
Alternative Travel Modes	The Homeowners Association will partner with the elementary school to create a "walking school bus program" for neighborhood students to safely walk to and from school to reduce vehicular trips for drop-off and pick-up.	No reduction assumed.	N/A
Energy Efficiency			
Energy Efficiency	Indoor residential appliances will carry the Environmental Protection Agency's (EPA) ENERGYSTAR® certification, as applicable and feasible.	Accounted for in CalEEMod Model.	CAPCOA White Paper, Appendix B
Energy Efficiency	All residential units will be part of the local utility demand response program to limit peak energy usage for cooling. Through the site design and building permit process, the Project will incorporate solar panels on buildings to offset the Project's overall electricity usage by 30%.Peak solar performance tends to coincide with peak energy usage. Thus, the Project-wide incorporation of solar will further limit peak energy usage.	No reduction assumed as to demand response program participation. (See below for information regarding commitment for provision of on-site solar resources.)	N/A
Water Conservation			
Low-Flow Fixtures	Indoor residential plumbing products would comply with the 2013 CALGreen Code, including future updates to CALGreen as these updates apply to homes in the project built under the updated code. The GHG emission reductions benefits of this PDF have been quantitatively incorporated into the Project's GHG inventory by including a measure within CalEEMod to account for the use of low-flow fixtures in all buildings.	Accounted for in CalEEMod Model.	CalEEMod Model

Water Conservation Plan	The Project includes a Water Conservation Plan that that will reduce outdoor water usage by 30% compared to existing outdoor water usage for typical residential homes. Through the Project's site plan process and, in the case of individual homeowners, the Project's CC&Rs, the Water Conservation Plan will require compliance with the County's "Water Conservation in Landscaping Ordinance" (aka, "Model Landscape Ordinance") for all outdoor landscapes in the Project, including common areas, public spaces, parkways, medians, parking lots, parks, and all builder or homeowner installed private front and backyard landscaping. The Water Conservation Plan goes beyond the County's Ordinance by applying to all landscaping installed in the Project. Consistent with the County's Ordinance, the Water Conservation Plan requires the use of a water allocation-based approach to landscape zones, use of drought-tolerant, low-water usage native plants, high-efficiency weather- or evapotranspiration-based irrigation controllers, soil moisture sensors, and drip emitters, soaker hose (e.g., netafim), or equivalent high-efficiency drip irrigation, and limitations on the use of natural turf in residential development to no more than 30% of the outdoor open space. Landscape plans and construction documents for developer and builder installed landscaping will be reviewed and approved by PDS for conformance with the Project's Water Conservation Plan. Individual homeowners will also have to show compliance with the Water Conservation Plan for front and backyard landscaping and may require separate permitting through the County for landscaping of 1,000 square feet or greater in size. The GHG emission reductions benefits of this PDF have been quantitatively incorporated into the Project's GHG inventory by including a measure within CalEEMod to account for a reduction in outdoor water use for irrigation of 30%. This is consistent with the requirements of the Resort Village Water Conservation Plan, Appendix VI to the Resort Village Specific Plan.	30% for outdoor water uses.	Water Conservation Plan
Building and Site Design			
California 2013 Title 24 Building Energy	Residential buildings would be designed to meet the California 2013 Title 24 Building	CEC study: Single family residential:	CEC 2013

Table 7
Proposed Project Design Features to Reduce GHG Emissions

Strategy to Reduce GHG Emissions	Description	Emission Reduction	Basis for Emission Reduction
Efficiency Standards as well as the 2013 "CALGreen" Building Code	Energy Efficiency Standards as well as the 2013 "CALGreen" Building Code, including future updates to these codes as these updates apply to homes in the project built under the updated codes.	36.4% reduction in electricity use, 6.5% reduction in natural gas use; multi-family residential: 23.3% reduction in electricity use, 3.8% reduction in natural gas use; nonresidential: 21.8% reduction in electricity use, 16.8% reduction in natural gas use.	
Curbside recycling	Project-wide curbside recycling for single-family, multi-family, resort, school, commercial, and retail establishments would be required in accordance with the California Integrated Waste Management Act (AB 939). The GHG emission reductions benefits of this PDF have been quantitatively incorporated into the Project's GHG inventory by including a measure within CalEEMod to account for a reduction in solid waste generation of 20%.	20% reduction in solid waste generation from CalEEMod defaults.	County of San Diego 2014
EV Plug-Ins	Dedicated circuits for electric vehicle plug-in facilities/stations would be installed in all residential garages per the 2015 CALGreen Interim Code Update (Effective July 1, 2015). The GHG emission reduction benefits of this PDF conservatively have not been quantified and not incorporated into the Project's GHG inventory.	No reduction assumed.	N/A
Passive Solar Design	The site design will incorporate passive solar design and building orientation principles to take advantage of the sun in the winter for heating and reduce heat gain and cooling needs during the summer.	No reduction assumed.	CAPCOA White Paper, Appendix B
Passive Solar Design	Vertical landscape elements such as trees and large shrubs shall be installed in order to shade southern and western building facades to reduce energy needed for heating and cooling.	No reduction assumed	CAPCOA White Paper, Appendix B
Solar Access – Hot Water	All single-family structures will be designed and constructed to allow for the later installation of solar hot water heaters.	No reduction assumed.	N/A

Lighting			
Energy-Efficient Lighting	As required by the construction document approval process, and subject to the approval of PDS, energy efficient LED lighting in compliance with the lead agency's illumination and energy conservation requirements will be installed along streets, parks, parking lots, and other public spaces. Through the building permit process, private developers and home builders in the project are required to use energy efficient lighting and design in accordance with Title 24 requirements. The GHG emission reduction benefits of this PDF conservatively have not been quantified and not incorporated into the Project's GHG inventory.	No reduction assumed.	N/A
Renewable Energy			
Solar Power	Through the site design and building permit process, the Project will incorporate solar panels on buildings to offset the Project's overall electricity usage by 30%.	30% offset of the Project's electrical energy usage.	Project-specific design feature

Additionally, in order to accurately estimate the proposed Project's GHG emissions, reference was made to the technical guidance of the County and SMAQMD in order to delineate a series of assumptions regarding applicable regulatory standards. More specifically, the 16 percentage reduction target identified in the County's 2015 GHG Guidance is based on the 2011 Final Supplement's integration of both economic data and implemented regulatory standards. The 2015 GHG Guidance requires estimation of both "unmitigated" and "mitigated" emissions. The former estimate is calculated assuming that the 20% renewable portfolio standard, the Pavley I vehicle standards, and 2008 Title 24 standards are in place, whereas the latter estimate is based on the existing regulatory framework and other project design considerations. A summary of the assumptions used to calculate mitigated emissions is presented in Table A-1 in Appendix A.

The 21.7 percentage reduction target identified in the SMAQMD's methodology is based on the 2011 Final Supplement's integration of economic data alone. Unlike the County's 2015 GHG Guidance, the SMAQMD methodology's BAU condition assumes that the 20% renewable portfolio standard is in place, the Pavley I vehicle standards have not been adopted, and the 2005 Title 24 standards are in place.

Implementation of the RPS will affect indirect GHG emissions associated with electricity use for the proposed Project because electricity will be purchased from San Diego Gas and Electric. According to the SDCGHGI, implementation of the 20% RPS mandate by 2010, as established by Senate Bill 107, would reduce GHG emissions by 14% from 2006 levels; credit was taken for these GHG savings in this analysis. As of September 23, 2010, the ARB has adopted the regulation that implements the 33% renewable energy standard. Implementation of the 33% target by 2020 will reduce GHG emissions by an additional 13% per the SDCGHGI. Thus, implementation of Executive Order S-21-09 would serve to reduce GHG emissions by a total of 27% below 2006 levels. The emission factors for utility energy use have been adjusted to account for implementation of the 33% RPS.

In addition to the reductions for implementation of the 33% RPS by San Diego Gas and Electric, the Project will include solar panels on buildings to meet a goal of replacing utility-generated electricity by 30%. This results in a reduction in GHGs from electricity use of 30%.

Implementation of the new Federal CAFE standards will achieve reductions that are equivalent to those proposed in AB 1493, the Pavley bill. According to the SDCGHGI, implementation of the Pavley standards would reduce emissions from light-duty on-road vehicles by a total of 20% by the year 2020. Based on information from the California Air Resources Board (ARB 2011b), the Pavley II standard would result in approximately 3% more reductions from passenger vehicles than the Pavley I standard by the year 2020, and would result in 12% more reductions by 2025. It was assumed, therefore, that implementation of the Pavley II emission standards would reduce overall vehicular running emissions by an additional 3% for light-duty autos and light-duty trucks only. The Pavley emission standards would not affect startup emissions, nor do they affect heavy-duty vehicles.

The LCFS is designed to reduce the carbon content of fuels, therefore reducing GHG emissions even if the amount of fuel consumed is constant. Based on the SDCGHGI, the LCFS would further reduce carbon emissions from fuel use by 10% by the year 2020. To account for this reduction, emissions of CO_2 and CH_4 were reduced by an additional 10%. The LCFS would not affect N_2O emissions.

The Traffic Impact Study identified a breakdown of trips between internal and external trips. The Traffic Impact Study states that the total trip generation of 27,191 ADT includes 5,275 internal trips, and 21,916 external trips. The Project provides a mix of uses, which CAPCOA estimates would result in reductions in VMT ranging from 9% to 30%. To account for these reductions in VMT, the Traffic Impact Study identified the percentage of trips that would be internal versus external for each type of land use. Internal trips would comprise 5% of trips associated with the resort; 10% of trips associated with single-family, multi-family, and public safety use trips would be 10% internal trips; 50% of trips associated with the retail development, 70% of trips associated with the park uses, and 80% of trips associated with the elementary school.

Conservatively, no credit was taken in this analysis for the Project's proposed mix of uses. Instead, CalEEMod default trip lengths and diverted/passby trips were used for both the

"unmitigated" and "mitigated" cases in the calculations. This assumption results in conservative emission estimates for the "mitigated" case because it assumes that trip lengths are not reduced by the on-site retail, school, and park uses.

Solid waste was assumed to be reduced 20% based on guidance from the County of San Diego (County of San Diego 2014).

The results of the 2020 GHG inventory for emissions with implementation of GHG reduction measures are presented in Table 8a for the proposed Project, and Table 8b for the optional development scenario.

Given the site's vacant condition, existing uses within the Project Site emit approximately zero (0) metric tons of CO_2e per year. As shown in Table 5a, in 2020, the Project would emit about 41,997 metric tons of CO_2e under unmitigated conditions, and as shown in Table 8a, the Project would emit about 34,692 metric tons of CO_2e per year under mitigated conditions. As such, the Project would increase the existing emissions level by approximately 34,692 metric tons of CO_2e per year.

According to the Project's Fiscal Impact Analysis (DPFG 2014), the residential population would be 3.59 people per household for a total residential population of 6,957. Additionally, the Project would generate 382 jobs and the occupancy rate for the Project's resort would be 70%, resulting in an average occupancy of 140 persons. The Project's service population, therefore, would be about 7,479 persons. Accounting for GHG reduction measures proposed for the Project, the proposed Project's emissions would be 4.6 metric tons of CO_2e per service population, which is below the BAAQMD, SCAQMD, and San Luis Obispo service population thresholds.

Table 8a SUMMARY OF PROPOSED PROJECT'S ESTIMATED GREENHOUSE GAS EMISSIONS- 2020				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Sources	582	0.0333	0.0102	586
Electricity Use	2,840	0.1182	0.0323	2,852
Natural Gas Use	3,516	0.0674	0.0645	3,535
Water Consumption	607	3.6141	0.09111	732
Solid Waste Handling	407	24.0396	0	1,080
Vehicles	24,902	0.9875	0	24,930
Amortized Construction	977	0	0	977
Total	**33,831**	**28.8601**	**0.1981**	**34,692**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	33,831	808	52	34,692
TOTAL CO_2 Equivalent Emissions	**34,692**			
Project Per County's 2015 GHG Guidance CO_2 Equivalent Emissions	**41,997**			
Percent Reduction	**17.40%**			
TOTAL CO_2 Equivalent Emissions	**34,692**			
Project Per SMAQMD Guidance CO_2 Equivalent Emissions	**46,364**			
Percent Reduction	**25.17%**			
CO_2 Equivalent Emissions per Service Population	**4.6**			

Table 8a presents a summary of the emissions associated with the project assuming that full buildout would occur in 2020, and demonstrates that the project would exceed the goal of reducing emissions by 16% below unmitigated levels, consistent with the County's 2015 GHG Guidance. The reduction would also exceed the Sacramento Metropolitan Air Quality Management District's threshold of a 21.7% reduction below unmitigated levels. In addition, the project would meet the BAAQMD's service population threshold of 4.6.

As shown in Table 5b, in 2020, the optional development scenario would emit about 40,542 metric tons of CO_2e under unmitigated conditions, and as shown in Table 8b, the optional development scenario would emit about 33,447 metric tons of CO_2e per year under mitigated conditions. As such, the Project would increase the existing emissions level by approximately 33,447 metric tons of CO_2e per year.

Table 8b
SUMMARY OF OPTIONAL DEVELOPMENT SCENARIO'S
ESTIMATED GREENHOUSE GAS EMISSIONS- 2020

Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Sources	582	0.0337	0.0102	586
Electricity Use	2,823	0.1175	0.0321	2,835
Natural Gas Use	3,553	0.0681	0.0651	3,572
Water Consumption	601	3.5753	0.0902	725
Solid Waste Handling	410	24.2278	0.0000	1,088
Vehicles	23,638	0.9347	0.0000	23,664
Amortized Construction	977	0	0	977
Total	32,584	28.9571	0.1976	33,447
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	32,584	811	52	33,447
TOTAL CO_2 Equivalent Emissions	**33,447**			
Project Per County's 2015 GHG Guidance CO_2 Equivalent Emissions	**40,542**			
Percent Reduction	**17.50%**			
TOTAL CO_2 Equivalent Emissions	**33,447**			
Project Per SMAQMD Guidance CO_2 Equivalent Emissions	**44,716**			
Percent Reduction	**25.20%**			
CO_2 Equivalent Emissions per Service Population[1]	**4.5**			

[1]Calculated using a service population of 7288 based on half of the employment for the retail (191) due to the reduction in retail uses by 20,000 square feet.

Table 8b presents a summary of the emissions associated with the optional development scenario assuming that full buildout would occur in 2020, and demonstrates that the optional development scenario would exceed the goal of reducing emissions by 16% below unmitigated levels, consistent with the County's 2015 GHG Guidance. The reduction would also exceed the Sacramento Metropolitan Air Quality Management District's threshold of a 21.7% reduction below unmitigated levels. In addition, the project would meet the BAAQMD's service population threshold of 4.6.

Based on the Project's Phasing Plan, the project's anticipated buildout is the year 2025. Emissions were therefore also calculated for 2025, accounting for additional reductions in GHG emissions that would be attributable to the full implementation of the Pavley II standards, which would reduce GHG emissions from vehicles by 12% by the year 2025 (ARB 2011b). Tables9a and 9b present emissions for the project and the optional development scenario at buildout in 2025.

Table 9a
SUMMARY OF PROPOSED PROJECT'S
ESTIMATED GREENHOUSE GAS EMISSIONS - 2025

Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Sources	582	0.0333	0.0102	586
Electricity Use	2,840	0.1182	0.0323	2,852
Natural Gas Use	3,516	0.0674	0.0645	3,535
Water Consumption	607	3.6141	0.09111	732
Solid Waste Handling	407	24.0396	0	1,080
Vehicles	21,965	0.9875	0.0000	21,993
Amortized Construction	977	-	-	977
Total	**30,894**	**28.8601**	**0.1981**	**31,755**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	30,894	808	52	31,755
TOTAL CO_2 Equivalent Emissions	**31,755**			
Project Per 2011 SupplementCO_2 Equivalent Emissions	**41,997**			

Percent Reduction	**24.39%**
Emissions per Service Population	**4.2**

Table 9b SUMMARY OF OPTIONAL DEVELOPMENT SCENARIO'S ESTIMATED GREENHOUSE GAS EMISSIONS - 2025				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Sources	582	0.0337	0.0102	586
Electricity Use	2,823	0.1175	0.0321	2,835
Natural Gas Use	3,553	0.0681	0.0651	3,572
Water Consumption	601	3.5753	0.0902	725
Solid Waste Handling	410	24.2278	0.0000	1,088
Vehicles	20,847	0.9347	0.0000	20,873
Amortized Construction	977	0	0	977
Total	**29,793**	**28.9571**	**0.1976**	**30,656**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	29,793	811	52	30,656
TOTAL CO_2 Equivalent Emissions	**30,656**			
Project Per 2011 Supplement CO_2 Equivalent Emissions	**40,542**			
Percent Reduction	**24.38%**			
Emissions per Service Population	**4.1**			

Also, as shown in Tables 8a and 9a, the proposed Project will reduce GHG emissions by 17.40% in 2020, and by 24.39% in 2025, without taking into account any additional GHG reduction measures beyond the currently adopted measures and additional reductions for implementation of the Pavley II standards. As shown in Tables 8b and 9b, the optional development scenario will reduce GHG emissions by 17.50% in 2020, and by 24.38% in 2025. Because the project would reduce emissions by more than 16% as required by the County, the Project would exceed the goal set forth in the County's 2015 GHG Guidance of 16% reduction. Therefore, the Project will not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

5.2 Consistency with Applicable Plans

With respect to the second significance criterion, the proposed Project will be consistent with applicable plans, policies, and regulations discussed in Section 1.3, including:

- ARB Scoping Plan – to the extent required by law, the proposed Project will comply with all applicable regulations adopted by the ARB and other regulatory agencies to implement the Scoping Plan pursuant to AB 32.
- Executive Order S-3-05 – the proposed Project, through implementation of project design features and compliance with vehicle standards, will enable achievement of the statewide goal of reducing GHG emissions to 1990 levels by 2020 and will be in line with the emission reductions needed to achieve the statewide goal of reducing GHG emissions to 80 percent below 1990 levels in 2050.
- Executive Order S-21-09 – the proposed Project will purchase power from San Diego Gas and Electric, which is developing its renewable portfolio standard in accordance with state mandates.
- California Code of Regulations Title 24 – the proposed Project will comply with the then-applicable Title 24 standards, thereby demonstrating a commitment to the energy efficient design, construction and operation of residential and non-residential structures.

- State Vehicle Standards – vehicles operating within the proposed Project will meet Pavley and LCFS standards to the extent required by law.
- Senate Bill 375 – the proposed Project is part of a master-planned community that provides a mix of uses serving the community, consistent with the general objectives of SB 375.
- County General Plan Policies – the proposed Project is consistent with applicable General Plan Policies discussed above.

At the regional level, SANDAG's Sustainable Communities Strategy (a component of SANDAG's 2050 Regional Transportation Plan) is an applicable plan adopted for the purpose of reducing GHGs in accordance with the 2020 and 2035 emission reduction targets adopted by the ARB for the San Diego region pursuant to SB 375. In order to assess the Project's potential to conflict with SANDAG's Sustainable Communities Strategy, the Project's residential land uses and associated average daily trips (ADTs) were compared to those assumed within the traffic analysis zones (TAZs) for the Project in the SANDAG Series 12 Year 2050 Regional Model (developed in conjunction with the 2050 Regional Transportation Plan). Based on that review, SANDAG's Model anticipates 18,922 residential ADTs on the Project site. The traffic impact study prepared in support of this EIR (Table 4.1 in the Traffic Impact Analysis) estimates that the Project will generate 10 trips per single-family unit (1,881 x 10 = 18,810), and 8 trips per multi-family unit (57 x 8 = 456), for a total of 19,266 residential ADT. Given the small difference between the two estimates (344 residential ADTs), the Project's proposed residential allowance is similar to that assumed in SANDAG's 2050 Regional Transportation Plan and Sustainable Communities Strategy. Therefore, the Project can be considered to be consistent with the development forecast outlined by SANDAG to achieve the ARB's GHG reduction targets for 2020 and 2035.

SANDAG's inclusion of the proposed land use development on the Project site in the Sustainable Communities Strategy's forecasted development pattern for the region (see Gov. Code, §65080(b)(2)(B)(vii)) is consistent with the fact that SANDAG was required to utilize the "most recent planning assumptions considering local general plans and other factors" when

preparing the Sustainable Communities Strategy (Gov. Code, §65080(b)(2)(B)). Here, the Resort Village (i.e., the proposed Project) is part of Otay Ranch's Subregional Plan, as approved in 1993. The County and other regional planning agencies (i.e., SANDAG)have been anticipating development on the Project site since that time.

Additionally, for purposes of SB 375's underlying policy goals, it is important to recognize that the proposed Project is part of the planned and approved Otay Ranch master-planned community, which contains a balanced mix of residential, commercial, civic, recreational and public facilities, all of which – when viewed from an integrated perspective – reduce the amount of vehicle miles traveled and corresponding GHG emissions. In addition to being part of a larger master-planned community, the proposed Project itself also contains a balanced mix of uses, including resident-serving commercial, retail and office uses, a 10.3-acre community park and 18.3 acres of neighborhood parks, an elementary school site, a fire station site, and a resort with up to 200 rooms and related amenities. The Project's mix of uses allows for the Project to internally capture approximately 19.4 percent of all vehicle trips (i.e., these trips remain within the boundaries of the Project site), with an approximate trip length of one mile in each direction. Further, the Project's mix of land uses, including residential in conjunction with the retail, parks, and school, is coupled with an integrated pathway and trail plan and traffic calming features along internal streets and roads that promote a pedestrian experience for the Project's residents and visitors and facilitate non-vehicular travel, consistent with SB 375.

In addition to the Sustainable Communities Strategy, the proposed Project is consistent with the County General Plan Conservation and Open Space Policies that are designed to reduce the emissions of criteria air quality pollutants, emissions of greenhouse gases, and energy use in buildings and infrastructure, while promoting the use of renewable energy sources, conservation, and other methods of efficiency. The following discussion highlights the Project's consistency with applicable General Plan Goals.

- The preservation of open space at the project site is consistent with General Plan Goals COS-1 and COS-2, designed to promote an interconnected preserve system and sustainability of the natural environment.

- The proposed Project is also consistent with General Plan Goal COS-14, Sustainable Land Development, through its mix of uses, provision of on-site parks, open space, retail, and school; and use of 30% solar power to conserve energy.
- The project is consistent with General Plan Goal COS-15, Sustainable Architecture and Buildings, in that it will meet green building standards and comply with Title 24 as of 2013, and future Title 24 requirements as implemented.
- The proposed Project is consistent with General Plan Goal COS-16, Sustainable Mobility, by providing a mix of uses on site, which will encourage alternative transportation modes.
- The proposed Project is consistent with General Plan Goal COS-17, Sustainable Solid Waste Management, in that it will encourage recycling and reduction of solid waste.
- The proposed Project is consistent with General Plan Goal COS-18, Sustainable Energy, by committing to provide 30% of electricity through solar power.
- The proposed Project is consistent with General Plan Goal COS-19, Sustainable Water Supply, by utilizing low-flow fixtures in all building designs, and implementing a water conservation plan designed to reduce water use by 30%.

The project would therefore not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

5.3 Future Project Greenhouse Gas Emissions

Further analyses were conducted to provide information on future GHG emissions in the years 2030 and 2050. Tables 10a and 10b present estimated emissions for 2030 for the proposed Project and the optional development scenario, and Tables 11a and 11b present estimated emissions for 2050. These emissions would be reduced further than shown in Tables 10a, 10b, 11a, and 11b due to implementation of additional GHG reduction measures and technological advancements that cannot be quantified with reasonable certainty at this time. The tables show that the project's emissions would continue to decrease due to reasonably foreseeable reductions in vehicular emissions attributable to existing regulatory standards. Although it is likely that the state of California will increase the targets for the Renewable Portfolio Standard beyond 2020, and that Title 24 standards will be increasingly energy efficient, no other reductions beyond existing regulatory programs affecting vehicle GHG emissions were assumed; as such, the future inventory estimates are conservative.

Table 10a SUMMARY OF PROPOSED PROJECT'S ESTIMATED GREENHOUSE GAS EMISSIONS - 2030				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Sources	582	0.0333	0.0102	586
Electricity Use	2,840	0.1182	0.0323	2,852
Natural Gas Use	3,516	0.0674	0.0645	3,535
Water Consumption	607	3.6141	0.09111	732
Solid Waste Handling	407	24.0396	0	1,080
Vehicles	20,561	0.6509	0.0000	20,579
Amortized Construction	977	-	-	977
Total	**29,490**	**28.5235**	**0.1981**	**30,341**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	29,490	799	52	30,341
TOTAL CO_2 Equivalent Emissions	**30,341**			

Table 10b SUMMARY OF OTPIONAL DEVELOPMENT SCENARIO'S ESTIMATED GREENHOUSE GAS EMISSIONS - 2030				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Sources	582	0.0337	0.0102	586
Electricity Use	2,823	0.1175	0.0321	2,835
Natural Gas Use	3,553	0.0681	0.0651	3,572
Water Consumption	601	3.5753	0.0902	725
Solid Waste Handling	410	24.2278	0.0000	1,088
Vehicles	19,512	0.6148	0.0000	19,529
Amortized Construction	977	0	0	977
Total	**28,458**	**28.6372**	**0.1976**	**29,312**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	28,458	802	52	29,312
TOTAL CO_2 Equivalent Emissions	**29,312**			

Table 11a SUMMARY OF PROPOSED PROJECT'S ESTIMATED GAS EMISSIONS - 2050				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Sources	582	0.0333	0.0102	586
Electricity Use	2,840	0.1182	0.0323	2,852
Natural Gas Use	3,516	0.0674	0.0645	3,535
Water Consumption	607	3.6141	0.09111	732
Solid Waste Handling	407	24.0396	0	1,080
Vehicles	17,742	0.5979	0.0000	17,759
Amortized Construction	977	-	-	977
Total	**26,671**	**28.4705**	**0.1981**	**27,521**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	26,671	797	52	27,521
TOTAL CO_2 Equivalent Emissions	**26,671**			

Table 11b SUMMARY OF OPTIONAL DEVELOPMENT SCENARIO'S ESTIMATED GREENHOUSE GAS EMISSIONS - 2050				
Emission Source	**Annual Emissions (Metric tons/year)**			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Operational Emissions				
Area Sources	582	0.0337	0.0102	586
Electricity Use	2,823	0.1175	0.0321	2,835
Natural Gas Use	3,553	0.0681	0.0651	3,572
Water Consumption	601	3.5753	0.0902	725
Solid Waste Handling	410	24.2278	0.0000	1,088
Vehicles	16,833	0.5645	0.0000	16,849
Amortized Construction	977	0	0	977
Total	**25,779**	**28.5869**	**0.1976**	**26,632**
Global Warming Potential Factor	**1**	**28**	**265**	
CO_2 Equivalent Emissions	25,779	800	52	26,632
TOTAL CO_2 Equivalent Emissions	**26,632**			

The emissions calculation for each horizon year is based on consistent assumptions regarding applicable regulatory standards and project design features. The differences in the emission calculations reflect the implementation status of regulatory standards impacting emissions from vehicle fleets at a given horizon year.

Although the Project's emissions level in 2050 cannot be reliably quantified with absolute certainty, statewide (e.g., ARB regulatory standards), regional (e.g., SB 375 sustainable community strategies) and local(e.g., climate action plans) efforts are underway to facilitate the State's achievement of that goal and it is reasonable to expect the Project's emissions level (31,483metric tons of CO_2e per year at full buildout in 2025) to decline as the regulatory initiatives identified by the ARB in the *First Update* are implemented, and other technological innovations occur. Stated differently, the Project's emissions total at the end of its build-out year of 2025 represents the maximum emissions inventory for the complete Project as California's emissions sources are being regulated (and foreseeably expected to continue to be regulated in the future) in furtherance of the State's environmental policy objectives.

For example, the ARB's *First Update* "lays the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050,"[1] and many of the emission reduction strategies recommended by the ARB would serve to reduce the Project's post-2020 emissions level to the extent applicable by law:[2]

- **Energy Sector:** Continued improvements in California's appliance and building energy efficiency programs and initiatives, such as the State's zero net energy building goals, would serve to reduce the Project's emissions level.[3] Additionally, further additions to

[1] ARB, First Update, p. 4, May 2014. See also id. at pp. 32–33 [recent studies show that achieving the 2050 goal will require that the "electricity sector will have to be essentially zero carbon; and that electricity or hydrogen will have to power much of the transportation sector, including almost all passenger vehicles"].

[2] ARB, First Update, Table 6: Summary of Recommended Actions by Sector, pp. 94-99, May 2014.

[3] ARB, First Update, pp. 37-39, 85, May 2014. Here, the GHG modeling conservatively assumes that the Project's residences will be subject to the 2013 Title 24 standards. However, given the phasing projections for the Project, which anticipate building construction starting in 2015 and concluding in 2025, it is likely that a subsequent, more rigorous iteration of the Title 24 standards will apply to the Project at the time of building permit issuance.

California's renewable resource portfolio would favorably influence the Project's emissions level.[4]

- **Transportation Sector:** Anticipated deployment of improved vehicle efficiency, zero emission technologies, lower carbon fuels, and improvement of existing transportation systems all would serve to reduce the Project's emissions level.[5]
- **Water Sector:** The Project's emissions level would be reduced as a result of further desired enhancements to water conservation technologies.[6]
- **Waste Management Sector:** Plans to further improve recycling, reuse and reduction of solid waste would beneficially reduce the Project's emissions level.[7]

The ARB also is implementing a market-based cap-and-trade program to reduce GHG emissions from major GHG-emitting sources, such as electricity generation, large stationary sources (e.g., refineries; cement production facilities; oil and gas production facilities; glass manufacturing facilities; and food processing plants), and fuel distributors (natural gas and propane fuel providers and transportation fuel providers). Although the Project is not a market participant for purposes of the cap-and-trade program, it will indirectly benefit from the emission reductions secured by the program from sources that are utilized by the Project (e.g., electricity generation and fuel providers).

In addition to the ARB's *First Update*, in January 2015, during his inaugural address, Governor Jerry Brown expressed a commitment to achieve "three ambitious goals" that he would like to see accomplished by 2030 to reduce the State's GHG emissions: (1) increasing the State's Renewable Portfolio Standard from 33 percent in 2020 to 50 percent in 2030;[8] (2) cutting the petroleum use in cars and trucks in half; and, (3) doubling the efficiency of existing buildings

[4] ARB, First Update, pp. 40-41, May 2014.
[5] ARB, First Update, pp. 55-56, May 2014.
[6] ARB, First Update, p. 65, May 2014.
[7] ARB, First Update, p. 69, May 2014.
[8] See also, *supra*, footnote 11.

and making heating fuels cleaner.[9] These expressions of Executive Branch policy may be manifested in adopted legislative or regulatory action through the state agencies and departments responsible for achieving the State's environmental policy objectives, particularly those relating to global climate change.

Further, a recent study shows that the State's existing and proposed regulatory framework will allow the State to reduce its GHG emissions level to 40 percent below 1990 levels by 2030, and to 60 percent below 1990 levels by 2050. Even though this study did not provide an exact regulatory and technological roadmap to achieve the 2050 goal, it demonstrated that various combinations of policies could allow the statewide emissions level to remain very low through 2050, suggesting that the combination of new technologies and other regulations not analyzed in the study could allow the State to meet the 2050 target.[10]

The Project's GHG emissions also are very small in comparison to state, national and global GHG emissions. Specifically, at buildout in 2025, the Project's percentage contribution to existing international (totaling 34.5 billion metric tons)[11], national (totaling 6.5 billion metric tons)[12], and California-specific (totaling 459 million metric tons)[13] GHG emission inventories is 0.0000920 percent, 0.000489 percent, and 0.00692 percent, respectively. This comparative data is not intended to suggest that the Project's emissions are de minimis; rather, the data is provided for overall context as, generally, it is the *combined* emissions of projects globally that appear to be the primary cause of global climate change, and not any one project.

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[9] Transcript: Governor Jerry Brown's January 5, 2015 Inaugural Address, http://www.latimes.com/local/political/la-me-pc-brown-speech-text-20150105-story.html#page=1, accessed January 14, 2015.

[10] Greenblatt, Jeffrey, Energy Policy, "Modeling California Impacts on Greenhouse Gas Emissions" *(Vol. 78, pp. 158-172).*

[11] http://edgar.jrc.ec.europa.eu/news_docs/pbl-2013-trends-in-global-co2-emissions-2013-report-1148.pdf

[12] U.S. EPA. 2014. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2012.* EPA 430-R-14-003. April 15.

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6.0 CONCLUSIONS

Emissions of GHGs would result in a net increase in emissions from construction and operations. As discussed in Section 5.0, however, emissions would be reduced to 16% below the level of emissions anticipated by the ARB in its 2011 Supplement through the implementation of regulatory compliance measures and PDFs designed to reduce GHGs. Because the proposed Project would have CO_2e of 4.6 metric tons of CO_2e per service population, and also would reduce GHG emissions by more than 16% from unmitigated levels, it would not:

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

Also, because the proposed Project is consistent with the applicable plans, policies, and regulations adopted for regulation of GHG emissions, the Project would not:

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

The proposed Project would therefore not result in any direct impacts to the global climate, and cumulative impacts would be less than significant.

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