APPENDIX I
GHG STUDY (JANUARY 2011)

Greenhouse Gas Emissions Analysis

This document is a summary of the greenhouse gas (GHG) emissions analysis for the proposed Project. It is based on the emission details provided in Appendix A and supporting appendices.

Threshold Analysis

California and the federal government have not established a threshold of significance for GHG emissions. However, the Bay Area Air Quality Management District (BAAQMD) became the first regulatory agency in the nation to approve guidelines that establish such a threshold for GHG emissions (BAAQMD 2010). In June 2010, the Santa Barbara County Planning and Development Department (SBCPD) produced a memorandum “Support for Use of Bay Area Air Quality Management District Greenhouse Gas Emissions Standards”, providing evidentiary support for reliance on the proposed BAAQMD standards as interim thresholds of significance in Santa Barbara County (SBCPD 2010). The memorandum notes that certain counties in the Bay Area are similar to Santa Barbara County in terms of population growth, land use patterns, General Plan policies, and average commute patterns and times.

The City of Goleta does not have established thresholds of significance for GHG emissions, and as the City is within Santa Barbara County, it has applied the following thresholds of significance to the Project.

Would the Project:

1. Exceed the daily significance threshold adopted by the BAAQMD, i.e., of 1,100 metric tons of carbon dioxide equivalent per year (MT CO_2e/yr), for operational GHG emissions and/or result in significant GHG emissions based on a qualitative analysis.
2. Employ reasonable and feasible means to minimize GHG emissions from a qualitative standpoint, in a manner that is consistent with the goals and objectives of Assembly Bill (AB) 32.

Construction Emissions

Impact GHG-1: Emissions of GHGs during Project construction have the potential to produce short-term impacts. As stated above, the City of Goleta has not adopted significance criteria for construction activities, and neither has the BAAQMD. Therefore, this analysis uses the qualitative approach to determining significance.

Construction-related emissions associated with heavy-duty construction equipment, material delivery trucks, and construction worker trips would occur intermittently during construction of the Project. Following completion of the Project, construction-related GHG emissions would cease. Construction is expected to last one year, and no extensive demolition or site grading will be required. Therefore, these emissions are considered temporary and short term in nature.

The methodology for quantifying GHG emissions from construction activities relies upon the California Emissions Estimator Model (CalEEMod) 2011 Version 2011.1.1 air quality modeling software, which is the most current version available (ENVIRON 2011). Table 1 presents the Projected GHG emissions generated during the 12-month construction period, which are below the significance threshold.

Table 1 – Estimated Construction-Related GHG Emissions

Construction Year	Project Construction CO_2 Emissions (metric tons)	Annual CO_2 Emissions Amortized over 30 Years (metric tons)
2014	526	18

Operational Emissions

Impact GHG-2: The Project's operational emissions generated by direct and indirect sources were calculated using a combination of CalEEMod, methodologies from California Air Resource Board's "Mandatory Reporting of Greenhouse Gas Emissions Regulations", and engineering calculations based on operational data provided by the developer of a hotel similar to the Project. The Oceanside Marriott Residence Inn in Oceanside, California, is similar to the Project in a number of respects, such that both hotels could be expected to have similar GHG emission profiles:

- Both hotels are of similar size (Project = 118 rooms; Oceanside Marriott Residence Inn = 125 rooms).
- Both have the same business model in that they serve the same extended stay business travel market (i.e., both are all-suites hotels).
- Both have a common design basis in that they both carry the Marriott Residence Inn brand name which requires certain common features for major aspects of their design and operation.
- Both are located in coastal Southern California and have comparable seasonal heating and cooling demands.

In general, when more site-specific data is unavailable, emissions were determined using CalEEMod. This was the case for all emissions except for energy and natural gas usage. These emissions were calculated based on operational data provided by the developer for the Oceanside Marriott Residence Inn. This hotel is similar in size, and is located within a climate that allows for engineering calculations based on the Oceanside hotel. For more information, see the Appendix A.

The remaining emissions were determined using CalEEMod, except for emissions from the planned Marriott Shuttle Van and Emergency Generator Testing. The contribution from these two emission sources is relatively small. See Table 2 for the estimated annual Project GHG emissions.

Table 2 – Quantitative Assessment of Estimated Project Operational Annual GHG Emissions

Operational Scenario/ Emissions Source	Emissions (MT CO_2e/year)	Estimation Methodology
Vehicle Usage (Mobile Sources)	360	CalEEMod
Electricity Consumption	323	Extrapolation from Similar Hotel
Natural Gas Consumption (Space Heating)	190	Extrapolation from Similar Hotel
Solid Waste Disposal	29	CalEEMod
Amortized Construction Emissions (30-years)	18	CalEEMod
Energy Used for Transporting Water for Consumption by the Project	7	CalEEMod
Marriott Shuttle Van	4	Engineering Calculation
Emergency Generator Testing	4	Engineering Calculation
Landscape Maintenance	<1	CalEEMod
Projected Annual CO2e Emissions	936	
Significance Threshold	1,100	
Exceeds Significance Threshold?	NO	

As shown in Table 2, the Project emissions are below the quantitative significance threshold of 1,100 MT CO_2e/year. Therefore, using this quantitative standard, GHG emissions associated with the Project are considered less than significant.

The Project will comply with the requirements of AB 32, including compliance with the requirements of California's Title 24 (2008) building standard. Title 24 (2008) is based on the Leadership in Energy and Environmental Design standard and is expected to produce for this project an 11 percent or greater increase in energy efficiency, and a concurrent 11 percent reduction in GHG emissions, over the baseline Title 24 (2005) code. In addition, in 2010 the Goleta City Council adopted the "City of Goleta Local Building Energy Efficiency Standards" ("Reach Code") that mandates new requirements for efficiency in buildings beyond those contained in Title 24 (2008). The Reach Code states a goal of GHG emission reductions of 15 percent beyond compliance with Title 24 (2008). Together, implementation of Title 24 (2008) and compliance with the Reach Code for the proposed Project are estimated to produce an overall GHG emissions reduction of 20 percent or greater compared to the Title 24 (2005) baseline. This estimated GHG emission reduction is equal to or greater than the AB 32 goals established in 2006 that requires a reduction in GHG emissions of 20 percent for state-owned buildings by 2015.

Mitigation Measures

All new residential and commercial buildings must comply with California Building Standards Code Title 24 (2008), Goleta Municipal Code (GMC), Title 15, Chapter 15.12, the Green Building Code of the City, as well as GMC, Title 15, Chapter 15.13 Energy Efficiency Standards of the City. These regulations result in total expected GHG emissions reductions of 20 percent or greater, consistent with Executive Order S-3-05 targets and AB 32 goals.

Project-related GHG emissions would be less than significant; therefore, no mitigation measures are required or recommended.

Assessing the Impact of Sea Level Rise on the Project is too Speculative to Conduct and is not Otherwise Required by CEQA

Climate change due to buildup of GHGs in the atmosphere has the potential to cause a rise in sea level. The postulated impact of a rise in sea level on the Project is that coastal flooding events could be enhanced if future sea level were higher. However, accurate assessment of the impact of climate change on the Project is a highly speculative activity. Published scientific articles indicate that there is no commonly-accepted methodology for determining if such impacts exist at this time, there is lack of scientific consensus as to how potential future climate change will influence future coastal flooding storm events, and any such analysis would rely on the selection of hypothetical climate change scenarios whose predictive accuracy cannot be confirmed.

In addition to the speculative nature of inquiry into the impacts of global warming on development Projects, there is no requirement under the California Environmental Quality Act (CEQA) that such impacts be reviewed. “The purpose of an EIR is to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment” (Public Resources Code section 21061). CEQA defines “environment” as the “physical conditions which exist within the area which will be affected by the proposed project…” (Public Resources Code section 21006.5). Analysis of the impacts associated with locating development in areas where the environment might affect the Project is not mandatory under CEQA (see CEQA Guidelines section 15126.2[a]), and it is well-settled that CEQA was enacted to protect the environment from the impacts of Projects, not to protect Projects from the impacts of the environment (South Orange County Wastewater Authority v. City of Dana Point [2011] 196 Cal.App. 4th 1604, 1617). Further analysis of the impact of climate change on the proposed Project is not required.

A more detailed discussion of the speculative nature of estimating future sea level rise is given in Appendix A.

Conclusions

The Project annual estimated emissions of 936 MT CO_2e/yr are below the significance threshold of 1,100 MT CO_2e/year used for this analysis. Therefore, based on this significance threshold, GHG emissions associated with the Project are considered less than significant.

All new residential and commercial buildings must comply with California Building Standards Code Title 24 (2008), GMC, Title 15, Chapter 15.12, the Green Building Code of the City, as well as GMC, Title 15, Chapter 15.13 Energy Efficiency Standards of the City. Together, implementation of the above emission reduction measures produces an overall GHG emissions reduction for the Project of approximately 20 percent or greater beyond the Title 24 (2005) baseline. This estimated GHG emission reduction is equal to the AB 32 goals established in 2006 that requires a reduction in GHG emissions of 20 percent for state-owned buildings by 2015.

Project-related GHG emissions will be less than significant. Therefore, no mitigation measures are required or recommended.

Residual impacts associated with Greenhouse Gas Emissions are considered less than significant (Class III).

References

Bay Area Air Quality Management District (BAAQMD), 2010. *California Environmental Quality Act Air Quality Guidelines.*

California Building Standards Commission, 2010. “The Cal Green Story”, available at <http://www.bsc.ca.gov/default.htm>

ENVIRON Int. Corp., 2011. *California Emissions Estimator Model (CalEEMod) User’s Guide*.

Santa Barbara County Planning and Development Department (SBCPD), 2010. Memorandum entitled “*Support for Use of Bay Area Air Quality Management District Greenhouse Gas Emissions Standards”.*

Appendix A

Greenhouse Gas Emissions Assessment Details

Appendix A

GREENHOUSE GAS EMISSIONS ASSESSMENT DETAILS

1.0 Existing Setting

This document provides detailed information on the greenhouse gas (GHG) emission estimation analysis for the proposed Marriott Residence Inn and Hollister Center (Project) in Goleta, California. The proposed Project is a Residence Inn brand Marriott extended stay hotel with a proposed 118 guest rooms. The Project site is located on approximately 3.8 acres along Hollister Avenue next to the Santa Barbara airport at an elevation of 13.5 feet (approximately 4 meters) above sea level.

2.0 Physical Scientific Basis of Climate Change

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to their temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation is not absorbed by GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, earth would not be able to support life as we know it.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is extremely unlikely that global climate change of the past 50 years can be explained without the contribution from human activities (Intergovernmental Panel on Climate Change [IPCC] 2008).

Climate change is a global problem. GHGs are global pollutants, unlike criteria pollutants and toxic air contaminants (TACs), which are pollutants of regional and local concern. Whereas criteria pollutants and TACs with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one year to several thousand years). GHGs persist in the atmosphere for a long enough time period to be dispersed around the world. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that currently more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 54 percent is sequestered within a year through ocean uptake, uptake by northern hemisphere boreal forest growth, and other terrestrial sinks, whereas the remaining 46 percent of human-caused CO_2 emissions remains stored in the atmosphere (Seinfeld and Pandis 1998).

Similarly, impacts of GHGs are borne globally, as opposed to localized air quality effects of criteria pollutants and TACs. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice it to say, the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climate. From the standpoint of the California Environmental Quality Act (CEQA), GHG impacts to global climate change are inherently cumulative.

According to the IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3 to 7 degrees Fahrenheit by the end of the century depending on future GHG emission scenarios (IPCC 2008). Resource areas other than air quality and global average temperature could be indirectly affected by the accumulation of GHG emissions. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state (including the Project site). According to the California Energy Commission (CEC), the snowpack portion of the water supply could potentially decline by 30 – 90 percent by the end of the 21st century (CEC 2006). A study cited in a report by the California Department of Water Resources projects that approximately 50 percent of the statewide snowpack will be lost by the end of the century (Knowles and Cayan 2002). Although current forecasts are uncertain, it is evident that this phenomenon could lead to significant challenges in securing an adequate water supply for a growing population. An increase in precipitation falling as rain rather than snow also could lead to increased potential for floods because water that would normally be held in the Sierra Nevada snowpack until spring could runoff and flow into the Central Valley concurrently with winter storm events. This scenario would place more pressure on California's levee/flood control system.

Another outcome of global climate change is sea level rise. Sea level rose approximately 7 inches during the last century and it is predicted to rise an additional 7 to 22 inches by 2100, depending on the future levels of GHG emissions (IPCC 2008). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion and disruption of wetlands (CEC 2006). As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available.

3.0 Greenhouse Gas Emission Sources

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, electric utility, residential, commercial, and agricultural sectors (California Air Resources Board [CARB] 2009). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CARB 2009). Emissions of CO_2 are primarily byproducts of fuel combustion. CH_4, a highly potent GHG, typically results from fugitive emission sources such as agricultural activities and landfills. N_2O is also largely attributable to agricultural activities and soil management. Smaller amounts of CH_4 and N_2O emissions occur as a byproduct of fuel combustion. CO_2 sinks, or reservoirs, include vegetation and the ocean, and absorb CO_2 through sequestration and dissolution, respectively.

California has one of the largest economies in the world, and is consequently one of the larger emitters of GHGs. In 2004, California released 484 million metric tons (MMT) of CO_2 equivalent (CO_2e) (CARB 2009) and is the 12th to 16th largest emitter of CO_2 in the world (CEC 2006).

CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential (GWP), is a measure of the heat trapping ability of a given GHG over a 100-year period relative to the heat trapping ability of CO_2. Expressing individual GHG emissions as CO_2e converts the heat trapping ability and longevity of the individual GHGs to a common basis that is equivalent to the effect that would occur if only CO_2 were being emitted.

Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 38 percent of total GHG emissions in the state. This sector was followed by the electric power sector (including generation sources both in-state and out-of-state that supply electricity to California) (22 percent) and the industrial sector (20 percent) (CARB 2008).

4.0 Regulatory Framework

CEQA requires that lead agencies consider the reasonable foreseeable adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to adversely affect the environment because they contribute to global climate change. In turn, global climate change has the potential to result in rising sea levels, which can inundate low lying areas; to affect rain and snowfall, leading to changes in water supply; and to affect habitat, leading to adverse effects on biological and other resources. Thus, GHG emissions require consideration in CEQA documents.

In considering global climate change, past regulatory actions of California are informative. For example, in 2002, the Sate adopted Assembly Bill (AB) 1493 requiring that CARB adopt by January 1, 2005, regulations to achieve: "The maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light duty trucks and other vehicles determined by CARB to be vehicles whose primary use is non-commercial transportation in the state." CARB adopted implementing regulations for AB 1493 in 2004.

In 2005, the Governor of California adopted Executive Order S-3-05, declaring that increased temperatures could reduce the Sierra Nevada mountain range's snowpack, increase air quality problems, and potentially cause a rise in sea levels. To address those concerns, the Executive Order set GHG emission targets such that emissions would be reduced to year 2000 levels by the year 2010, year 1990 levels by the year 2020, and 80 percent of year 1990 levels by the year 2050.

In 2006, AB 32, the California Global Warming Solutions Act of 2006, was signed into law. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statement GHG emissions. It requires that statewide GHG emissions be reduced to 1990 levels by 2020. To effectively implement that cap, among other things, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. In October 2008, CARB published its climate change proposed scoping plan, which is the State's plan to achieve GHG reductions in California required by AB 32.

In August 2007, the State adopted Senate Bill (SB) 97. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Natural Resources Agency guidelines for the feasible mitigation of the effects of GHG emissions, as required by CEQA by July 1, 2009. The Natural Resources Agency was required to certify or adopt those guidelines by January 1, 2010. Those guidelines were submitted, and on March 18, 2010, became effective. In relevant part, those guidelines in Section15126.4(c) provide as follows:

> Consistent with Section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:
>
> 1) measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
> 2) reductions in emissions resulting from a project through implementation of project features, project design, or other measures;
> 3) off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
> 4) measures that sequester greenhouse gases;
> 5) in the case of adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

In 2007, the Governor directed the California Building Standards Commission to work with specified state agencies on the adoption of green building standards for residential, commercial, and public building construction for the 2010 Code adoption process. That process resulted in the adoption of the 2010 California Green Building Code (CAL GREEN). Specific elements of the CAL GREEN Code include:

- 20 percent mandatory reduction in indoor water use, with voluntary goal standards for 30, 35, and 40 percent reductions;
- Separate water meters for nonresidential buildings' indoor and outdoor water use, with a requirement for moisture-sensing irrigation systems for larger landscape projects;
- Requirement for diversion of 50 percent of construction waste from landfills, increasing voluntarily to 65 and 75 percent for new homes and 80 percent for commercial projects;
- Mandatory inspections of energy systems (i.e. heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies; and
- Requirement for low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.

On November 2, 2010, the Goleta City Council adopted CAL GREEN. That action became effective January 1, 2011. CAL GREEN mandates new requirements for planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, environmental quality, and installer and special inspector qualifications.

On November 2, 2010, the Goleta City Council adopted an ordinance implementing a local building energy efficiency standard for the City that includes a "reach" goal of an additional 15 percent reduction in GHGs when compared to the Title 24 (2008) California Building Standards Code. The increased energy efficiency standards apply to new buildings or structures of any size, including the Project.

5.0 Thresholds of Significance

As directed by SB 97 and noted above, the Natural Resources Agency adopted amendments to the CEQA Guidelines and they became effective on March 18, 2010. These new CEQA Guidelines provide regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents. According to the amendments made to Appendix G of the CEQA Guidelines, the Project would have a significant impact if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. (Initial Study Checklist)
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. (Initial Study Checklist)

The adopted CEQA amendments require a Lead Agency to make a good-faith effort based, to the extent possible, on scientific and factual data in order to describe, calculate, or estimate the amount of GHG emissions resulting from a Project. They give discretion to the Lead Agency whether to:

- Use a model or methodology to quantify GHG emissions resulting from a project, and which model or methodology to use; and/or
- Rely on a qualitative analysis or performance-based standards.

In addition, a Lead Agency should consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:

- The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
- Whether the project emissions exceed a threshold of significance that the Lead Agency determines applies to the project; and
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The amendments call on Lead Agencies to establish significance thresholds for their respective jurisdictions and clarify that the effects of GHG emissions are cumulative, and should be analyzed in the context of CEQA's requirements for cumulative impact analysis.

Currently, neither California nor the City of Goleta has established CEQA significance thresholds for GHG emissions. Indeed, many regulatory agencies are sorting through suggested thresholds and/or making project-by-project analyses. This approach is consistent with that suggested by California Air Pollution Control Officers Association (CAPCOA) in its technical advisory entitled "CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act Review (CAPCOA 2008):

> …In the absence of regulatory standards for GHG emissions or other specific data to clearly define what constitutes a 'significant project', individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice.

In June 2010, the Bay Area Air Quality Management District (BAAQMD) became the first regulatory agency in the nation to approve guidelines that establish thresholds of significance for GHG emissions (BAAQMD 2010). These thresholds are summarized in Table 1.

Table 1 – Bay Area Air Quality Management District GHG Thresholds of Significance

GHG Emission Source Category	Operational Emissions	Units
Other than Stationary Sources	1,100	MT CO_2e/yr
	4.6	MT CO_2e/SP/yr
Stationary Sources	10,000	MT CO_2e/yr
Plans	6.6	MT CO_2e/SP/yr
MT CO2e – metric tons CO_2 equivalent SP/yr - Service Population per year (residents and employees)		

The BAAQMD threshold is a promulgated CEQA threshold that has undergone full public review and comment, with approval by the BAAQMD governing board, and technical support by BAAQMD staff. It applies to a nine-county portion of northern California consisting of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, the western portion of Solano, and the southern portion of Sonoma counties. It applies to a nine-county area of very diverse population and land use, extending from the urban core surrounding the San Francisco Bay to the pastoral and rural areas of Napa, Marin, Solano, and Sonoma counties.

The BAAQMD GHG significance threshold has a strong regulatory and technical underpinning. It is based on substantial data, is intended as a regulatory threshold, and applies in some areas of the BAAQMD jurisdiction that resemble some land use patterns in the Goleta area. The climatic regime in the Goleta-Santa Barbara area that governs energy demand for space heating and cooling is also very comparable to that occurring in the BAAQMD. Additionally, in June 2010, the Santa Barbara County Planning and Development Department (SBCPD) produced a memorandum *"Support for Use of Bay Area Air Quality Management District Greenhouse Gas Emissions Standards"*, providing evidentiary support for reliance on the proposed BAAQMD standards as interim thresholds of significance in Santa Barbara County (SBCPD 2010). The memorandum notes that certain counties in the Bay Area are similar to Santa Barbara County in terms of population growth, land use patterns, General Plan policies, and average commute patterns and times.

Accordingly, given that the City of Goleta does not have established thresholds of significance for GHG emissions, and as the City is located in Santa Barbara County, the rationale for applicability of the BAAQMD thresholds would generally apply. Therefore, for the Marriott Residence Inn and Hollister Center Project, the City has applied the following two thresholds of significance to the project. Would the project:

1) Exceed the daily significance threshold adopted by the Bay Area Air Quality Management District, i.e., of 1,100 metric tons of CO_2e per year (MT CO_2e/yr), for operational GHG emissions and/or result in significant GHG emissions based on a qualitative analysis.
2) Employ reasonable and feasible means to minimize GHG emissions from a qualitative standpoint, in a manner that is consistent with the goals and objectives of AB 32.

It is also noted that the use of the BAAQMD threshold does not imply that it is a threshold that the City of Goleta has formally adopted, or should adopt, as a GHG significance threshold for all present or future project analyses.

6.0 Project Specific Impacts

Given the global nature of climate change resulting from GHG emissions, GHG emission impacts are inherently cumulative in nature. As such, the determination of whether a project's GHG emissions impacts are significant depends on whether emissions would be a cumulatively considerable contribution to the significant cumulative impact. This is assessed below.

6.1 Cumulative Impacts

Construction-related emissions would be generated from heavy-duty construction equipment and on-road vehicle exhaust emissions. Operational emissions would be generated from worker and hotel guest vehicle trips to and from the Project. Area source GHG emissions are a result of natural gas consumption associated with space and water heating and the usage of landscape maintenance equipment. Additionally, the Project would consume electricity and potable water, both of which generate GHG emissions associated with electricity production used to transport the water.

GHG emissions associated with construction and operation of the Project would predominantly be in the form of CO_2. While emissions of other GHGs, such as CH_4 and N_2O, are important with respect to global climate change, the Project is not expected to emit substantial quantities of GHGs other than CO_2, even when factoring in the relatively larger GWP of CH_4 and N_2O. This is because most emissions from the Project would be associated with vehicular emissions (i.e., mobile-source emissions), natural gas combustion, and indirect emissions associated with the purchase of electricity. Although these sources emit small quantities of N_2O and CH_4, emissions of CO_2 dominate the GHG emissions from the Project. Emissions of PFCs and SF_6 are typically associated with industrial facilities and are not expected to be emitted from the Project.

Unlike criteria air pollutants and TACs such as reactive organic gases and nitrous oxides (NO_x), which are pollutants of regional and local concern, GHGs are global pollutants and climate change is a global issue.

The Project's construction and operational emissions generated by direct and indirect sources were calculated using a combination of emission modeling, engineering calculations based on the California Air Resource Board's *Mandatory Reporting of Greenhouse Gas Emissions Regulations*, and engineering calculations extrapolating from operational data provided by the Developer of a hotel similar to the Project.

The emission modeling was performed using the California Emissions Estimator Model (CalEEMod) 2011 Version 2011.1.1 air quality modeling software. This emission model is the emission modeling tool preferred by local Districts for performance of emission estimation for CEQA projects. Table 2 presents the Project assumptions used in the CalEEMod modeling.

Table 2 – Project Assumptions Used in CalEEMod Modeling

Assumption	Value	Unit	Comment
Land Use	Recreational – Hotel	N/A	N/A
Room Quantity	118	Rooms	N/A
Lot Acreage	3.81	Acres	Smaller than Default, as indicated in the site plans.

Table 2 – Project Assumptions Used in CalEEMod Modeling

Assumption	Value	Unit	Comment
Construction – Site Prep	5	Days	Total Construction is about one year of work, at five days a week. Demolition and mass grading will not be required. Construction time is about 10% less than default values. Construction assumed to occur in 2014.
Construction – Build	207	Days	
Construction – Paving	16	Days	
Construction – Architectural Coatings	16	Days	
Off-Road Equipment	N/A	N/A	Defaults Used
Construction – Vehicle Miles Traveled	N/A	N/A	Defaults Used
Operational – Mobile	N/A	N/A	Defaults for Motel were used as they fit the description for trip generation better than a standard hotel.
Operational – Landscape	180	Days	Default Used
Operational – Energy Use	N/A	N/A	Ignored – Site-specific data for Marriott in Oceanside was adapted for this Project.
Operational – Water	N/A	N/A	Defaults Used
Operational – Solid Waste	N/A	N/A	Defaults Used
Vegetation and Mitigation	N/A	N/A	Not Used

Impact GHG-1 – Construction Emissions

Emissions of GHGs during Project construction have the potential to produce short-term impacts. As stated above, the City of Goleta has not adopted significance criteria for construction activities, and neither has the BAAQMD. Because of the short-term nature of construction emissions compared to the lifetime of the project, it is common practice to amortize the construction emissions over the assumed commercial lifetime of the facility. For a residential hotel, a 30-year period is a reasonable estimate of the commercial lifetime of a hotel prior to renovation.

Construction-related GHG emissions associated with heavy-duty construction equipment, material delivery trucks, and construction worker trips would occur intermittently during construction of the Project. Following completion of the Project, construction-related GHG emissions would cease. Therefore, these emissions are considered temporary and short term in nature.

CalEEMod is designed to model emissions associated with development of land uses in California and attempts to summarize CO_2, as well as criteria pollutant emissions, that would occur during construction and operation of a new development. This model is publicly available and is the standard model for use to support CEQA analyses. CalEEMod was developed with the aid of several California Air Districts, including BAAQMD and Santa Barbara County Air Pollution Control District (SBCAPCD), and is recommended for use for CEQA projects by SBCAPCD. Therefore, it is appropriate for quantifying GHG emissions for the project (ENVIRON 2011; SBCAPCD 2011). Detailed assumptions used in CalEEMod are provided in Appendix B and the emission computation and CalEEMod report is provided in Appendix C.

Table 2 presents the estimated GHG emissions generated during Project construction activities. The construction is assumed to occur over the course of a 12-month period and thus the estimated emissions reflect a peak annual emission rate from construction activities. As shown in Table 3, the Project will generate approximately 526 metric tons of CO_2e during the entire construction period. When amortized over a typical 30-year commercial lifetime, the construction emissions are estimated to be 18 metric tons per year.

Table 3 – Estimated Construction-Related GHG Emissions

Construction Year	Project Construction CO2 Emissions (metric tons)	Annual CO2 Emissions Amortized over 30 Years (metric tons)
2014	526	18

With regard to Best Management Practices (BMPs), SBCAPCD typically recommends implementation of a set of mitigation measures during construction and these conditions will be made a condition of certification by the City.

The Project's estimated construction-related GHG emissions would not have a cumulatively considerable contribution to climate change for the following reasons:

1) The construction-related emissions would be temporary and finite in nature.
2) The Project construction activities will follow BMPs.
3) The process by which the construction emissions are deemed to have a less than significant impact is consistent with the SBCAPCD guidance, and is therefore consistent with the AB 32 Scoping Plan.

Therefore, Project construction-related GHG emissions are considered less than significant.

Impact GHG-2 – Operational Emissions:

Electricity and Natural Gas Emissions

The Oceanside Marriott Residence Inn in Oceanside, California, is similar to the Project in a number of respects, such that both hotels could be expected to have similar GHG emission profiles:

- Both hotels are of similar size (Project = 118 rooms; Oceanside Marriott Residence Inn = 125 rooms)
- Both have the same business model in that they serve the same extended stay business travel market (i.e., both are all-suites hotels);
- Both have a common design basis in that they both carry the Marriott Residence Inn brand name which requires certain common features for major aspects of their design and operation; and
- Both are located in coastal Southern California and have comparable seasonal heating and cooling demands.

The Goleta area is in the CEC climate zone 6, while the Oceanside area is in climate zone 7, as defined in California Title 24 (CEC, 2009). These two areas are in essentially equivalent climatic zones as confirmed by statistical analysis of the meteorological design data provided in Appendix JA2.2 of the References Appendices for the Title 24 (2008) building code (CEC 2009). Based on this statistical analysis (see Appendix D), there is no significant difference, at the 95 percent confidence level, in the meteorological parameters used to establish the design criteria for the summer cooling season for climatic Zones 6 and 7. For the winter heating season, the variability in the Zone 6 design meteorological parameters is contained entirely within the variability observed in the design meteorological conditions for Zone 7, again based upon the 95 percent confidence interval. In essence, climatic Zone 6 is a subset of climatic Zone 7 for the winter heating season.

Oceanside utility data were available for 216 days, beginning in late August 2007 and extending to late March 2008. As cold season heating degree days significantly exceed the warm season cooling degree days in Santa Barbara (an average of 2,121 heating degree days versus 452 cooling degree days in Santa Barbara) (National Climatic Data Center 2010), a predominance of cool season months in the Oceanside utility data, when extrapolated to the annual period, will represent a conservative (high) estimate of annual utility emissions for the project.

To provide an estimate of annual emissions for indirect electrical usage and natural gas consumption emissions for the Project, the Oceanside data were linearly extrapolated to 365 days of operation. While the Oceanside hotel is slightly larger than the Project in terms of guest rooms, no adjustment was made to the utility data based on the number of guest rooms, thereby helping to ensure that the utility usage and corresponding GHG emissions were not under estimated.

Traffic-Related Emissions

CalEEMod calculates the GHG emissions associated with Project-generated traffic and these emissions depend on the type of hotel that is being analyzed. CalEEMod defines a hotel as a “place of lodging, providing sleeping accommodations and supporting facilities such as restaurants; cocktail lounges; meeting and banquet rooms or convention facilities; limited recreational facilities and other retail and service shops”. A motel is defined as a “place of lodging that provides sleeping accommodations and often a restaurant. Motels generally offer free on-site parking and provide little or no meeting space and few supporting facilities.”

The Project has no food and beverage services open to the general public. Therefore, motels have fewer deliveries for food and beverages, there are fewer hotel employees, and there are no trips attributable to restaurant customers. Additionally, motel meeting space is limited and does not have the facilities necessary to host any large events or conventions.

The Project is more consistent with the CalEEMod definition of a motel than that of a hotel. Thus, trip rates to the Project are more likely to fit those of a motel and the CalEEMod motel default trip generation rate was used to represent the Project. The default trip generation assumptions in CalEEMod are given below in Table 4. The annual vehicle miles traveled (VMT) estimated by CalEEMod for the project is 882,074 miles. The CalEEMod files are provided in Appendix C.

Table 4 – CalEEMod Default Trip Generation Assumptions

CalEEMod Parameter (Motel)	Value	Units
Trip Generation rate	5.63	Trips/room/day
Trip Length – Commercial to Customer	4.6	Miles/trip
Trip Length – Commercial to Nonwork	4.6	Miles/trip
Trip Length – Commercial to Work	8.8	Miles/trip
Commercial to Work Trips	19	Percent of total trips
Commercial to Customer and Commercial to Nonwork Trips	81	Percent of total trips
Diverted trip length fraction	25	Percent of primary trip length
Pass-by trip length	0.1	Mile
Primary trip fraction	58	Percent of total trips
Diverted trip fraction	34	Percent of total trips
Diverted trip fraction	4	Percent of total trips

Implicit in the CalEEMod traffic emission computation method is the assumption of 100 percent occupancy of the hotel for the entire year. In reality, the annual occupancy will be lower than 100 percent. Lower occupancy will result in lower GHG emissions from vehicle travel associated with the Project. Based on an occupancy study conducted for the Project, the expected annual occupancy for the Project will be 87 percent. However, to be conservative for the current analysis, an occupancy factor of 100 percent was assumed for the Project, yielding a high estimate of GHG emissions. The occupancy study is included in Appendix E.

Minor Source Emissions

Solid waste produced by the Project is also estimated by CalEEMod. This module determines the emissions associated with disposal of solid waste into landfills. The waste disposal rate and the composition of the municipal solid waste is determined using Calrecycle data (ENVIRON 2011).

GHG emissions occur due to water consumption associated with electricity consumption required for treatment and transport of fresh water to the property and the subsequent transport and treatment of wastewater from the property. The CalEEMod defaults for Santa Barbara County south of the Santa Ynez Mountain Range were used for determining these indirect emissions. The CalEEmod report showing GHG emissions by process are in Appendix C.

The facility will operate a shuttle van to and from the Santa Barbara Municipal Airport. During off times, the van will be used to run errands, primarily for purposes of maintenance. CARB methodology was used to calculate the additional GHG emissions associated with the estimated shuttle can trips.

Landscape maintenance is a very minor area source of GHG emissions. CalEEMod produced estimated landscape maintenance emissions of less than 0.01 metric tons per year.

More detailed emissions calculations and assumptions can be found in Appendix B.

Operational Emissions Summary and Threshold Determination

Table 3 presents the estimated annual emissions for the Project. As shown in Table 5, the Project emissions are below the quantitative significance threshold of 1,100 MT CO_2e/year. Therefore, using this quantitative standard, GHG emissions associated with the Project are considered less than significant.

Table 5 – Estimated Project Operational Annual GHG Emissions

Operational Scenario/Emissions Source	Emissions (MT CO_2e/year)
Vehicle Usage (Mobile Sources)	360
Electricity Consumption	323
Natural Gas Consumption (Space Heating)	190
Solid Waste Disposal	29
Amortized Construction Emissions (30-years)	18
Energy Used for Transporting Water for Consumption by the Project	7
Marriott Shuttle Van	4
Emergency Generator Testing	4
Landscape Maintenance	<1
Projected Annual CO_2e Emissions	936
Significance Threshold	1,100
Exceeds Significance Threshold?	NO

6.2 GHG Emissions Reductions Analysis

The objective of emissions reductions under AB 32 is to reduce California's GHG emissions back to 1990 levels by 2020. One aspect of emissions reductions required under AB 32 is reductions in energy usage in buildings. As part of the framework of executive orders that were issued leading up to AB 32 and subsequent to its passage, Governor Schwarzenegger (at the time) issued Executive Order S-20-04 that created the "Green Building Action Team". One of the accomplishments of the Green Building Action Team as establishment of energy efficiency measures for State-owned buildings, with a goal of reducing grid-based electricity usage in those buildings by 20 percent in the year 2015 (California Building Standards Commission 2010). This building energy efficiency goal provides an appropriate metric against which to compare emission reductions associated with a given project involving the construction of buildings, when compared to the business-as-usual (BAU) scenario. A key element in this analysis is the definition of the

BAU scenario. The current 2009 Leadership in Energy and Environmental Design (LEED) standard (LEED 2009 for New Construction and Major Renovation Rating System) uses the Title 24 (2005) standard as the baseline building performance for new projects in California. The use of the California Title 24 (2005) building standard as the BAU scenario is therefore appropriate because it as the California building standard in effect at the time AB 32 was signed into law and thus will relate directly to the Green Building Action Team energy reduction requirement of 20 percent by 2015.

The Title 24 (2008) building standard superseded the Title 24 (2005) building standard with an effective date of January 1, 2010. A comparison of the Title 24 (2008) standard against the Title 24 (2005) standard provides an estimate of emissions reductions associated with compliance with newer, more stringent Title 24 (2008) building standard. The impact of the standard is stated in terms of energy use reductions. Since energy use reductions are directly related to GHG emissions reductions from fossil fuel combustion, a given energy efficiency reduction at a source is directly proportional to the reduction in GHG emissions associated with that source.

In 2007, the CEC commissioned a study analyzing the statewide impact of changes between the Title 24 2005 and 2008 building standards (CEC 2007). The energy efficiency improvements of the 2008 standard over the 2005 standard from the CEC report are presented in Table 4 for non-residential heating, cooling, and lighting. There is an overall reduction in energy use of 4.9 percent due to implementation of the Title 24 (2008) building standard in non-residential building construction. However, this reduction is heavily weighted by industrial building construction that includes industrial fans, refrigeration equipment, and other equipment for which the Title 24 (2008) building standard requires minimal improvements. A more appropriate comparison is with the energy use reductions for that subset of uses consisting of heating, cooling, and lighting. The 2008 standard requires significant reductions in non-residential energy use for heating, cooling, and lighting. The 2008 standard requires significant reductions in non-residential energy use for heating, cooling, and lighting over the baseline Title 24 (2005) building standard. Specifically, the 2008 standard results in an estimated 37 percent energy reduction in heating, an 8 percent reduction in cooling, and a 12 percent reduction in lighting energy consumption. Overall, a weighted average reduction for these three energy uses, weighted by the respective Statewide baseline energy usage, results in an estimated average 11 percent reduction on a statewide basis (see Table 6) for non-industrial energy use.

Table 6 – Estimation of Statewide Reductions in Energy Use for Non-Residential* Construction from Heating, Cooling, and Lighting due to Implementation of California Title 24 (2008) Building Standard from the Baseline Title 24 (2005) Building Standard

Energy Use Source	Statewide 2005 Baseline Energy Use (GW**) (%)	Statewide 2008 Energy Use (GW) (%)	Energy Savings 2005 – 2008 (GW)	Reduction from Baseline	Weighted Fraction, Reduction from Baseline (%)***
Heating	33 (2.6%)	21 (1.9%)	12	37.2%	
Cooling	392 (31.4%)	360 (32.5%)	32	8.3%	11%
Lights	822 (65.9%)	726 (65.6%)	96	11.7%	
Totals	1,247 (100.0%)	1,107 (100.0%)	140		

* Industrial energy uses are not included in this table.

** GW = gigawatt

*** Reduction from baseline is weighted by the fraction of each energy use in 2005 baseline

SOURCE: California Energy Commission, Impact Analysis – 2008 Update to the California Energy Efficiency Standards for Residential and Non-residential Buildings, Architectural Energy Corporation, Table 2, November 7, 2007.

As the Project is currently subject to the Title 24 (2008) standard, the Project is estimated to achieve an energy efficiency gain that is at least 11 percent beyond that of the Title 24 (2005) BAU baseline for non-residential heating, cooling, and lighting, as shown in Table 4.

As noted earlier, on November 2, 2010, the Goleta City Council adopted CAL GREEN. That action became effective January 1, 2011. CAL GREEN mandates new requirements for certain efficiencies in buildings. In addition, on November 2, 2010, the Goleta City Council adopted an ordinance implementing a local building energy efficiency standard for the City that includes a “reach” goal of an additional 15 percent reduction in GHGs when compared to the Title 24 (2008) California Building Standards Code. The increased energy efficiency standards apply to new buildings or structures of any size, including the Project. When this 15 percent anticipated reach goal is included with the 11 percent or greater energy efficiency gain estimated to be achieved through implementation of Title 24 (2008), the overall energy efficiency gain for the Project beyond the Title 24 (2005) standard is greater than or equal to 20 percent.

The analysis above demonstrates that the cumulative GHG emissions reductions resulting from implementation of Title 24 (2008), CAL GREEN (2010), and the City of Goleta Local Building Energy Efficiency Standards (“Reach Code”), will result in a significant reduction in energy use (and hence GHG emissions) over the 2005 BAU baseline percent (see Table 7). The total expected GHG emissions reductions over this baseline are 20 percent or greater. This GHG reduction is consistent with the AB 32 goals established in 2006 of 20 percent for state-owned buildings (by 2015). Therefore, the Project operational emissions are also considered less than significant when judged on a qualitative basis.

A letter from the Developer to the City of Goleta committing to emission reductions of at least 9 percent above Title 24 (2008) requirements is given in Appendix F. This ensures that the project will meet the requirements of AB 32.

Table 7 – Qualitative Assessment of GHG Emissions Reductions for the Project

GHG Emissions Reduction Source	Credited Reduction
Reduction of GHG emissions over Baseline Title 24 (2005) Building Code by Implementation of Title 24 (2008) Building Code (see also Table 4)	11%
Further minimum emissions reductions required by the CAL GREEN 2010 standard and the City of Goleta Local Building Energy Efficiency Standards ("Reach Code") and committed to by the Developer	≥ 9% (unquantified)
Total expected GHG emissions reduction beyond the Baseline Title 24 (2005) Building Code	≥ 20%
Green Building Action Team emissions reduction requirement for State-owned buildings by 2015	20%
Do the emissions reduction expectations equal or exceed the Green Building Action Team emissions reduction requirement for State-owned buildings?	Yes

6.3 Mitigation Measures

All new residential and commercial buildings must comply with California Building Standards Code Title 24 (2008), Goleta Municipal Code (GMC), Title 15, Chapter 15.12, the Green Building Code of the City, as well as GMC, Title 15, Chapter 15.13 Energy Efficiency Standards of the City. These regulations result in total expected GHG emissions reductions of 20 percent or greater, consistent with Executive Order S-3-05 targets and AB 32 goals.

Project-related GHG emissions would be less than significant; therefore, no mitigation measures are required or recommended.

6.4 Assessing the Impact of Sea Level Rise on the Project is too Speculative to Conduct and is not Otherwise Required by CEQA

The chief potential impact of climate change on the Project is a rise in sea level such that the Project would be impacted by coastal flooding events whose intensity is enhanced by sea level rise. However, accurate assessment of the impact of climate change on the Project is a highly speculative activity; published scientific articles indicate that there is no commonly-accepted methodology for determining such impacts exists at this time, there is lack of scientific consensus as to how potential future climate change will influence future coastal flooding storm events, and any such analysis would rely on the selection of hypothetical climate change scenarios whose predictive accuracy cannot be confirmed.

Uncertainty Associated with Future Climate Change Impacts

It is not possible at this time to state with any degree of confidence and numerical precision a quantitative result representing the future rise in average global sea level, average temperature, average precipitation, or any other potential impact of climate change on the environment. Among the factors leading to this conclusion are the following:

1) The global climate is a very complicated non-linear system for which there is currently incomplete knowledge of the climatic response to any particular carbon emission budget. Consequently, uncertainty in how climate may change for a given future carbon emission burden, as estimated by General Circulation Models[1] (GCMs), will lead to significant uncertainty in the estimate of future mean sea level rise attributable to climate change.

The existence of climate change due to manmade, or anthropogenic, emissions of GHG is a topic involving substantial disagreement in the media and among the general public but not within the scientific community. The scientific community overwhelmingly agrees that climate change is occurring and that anthropogenic GHG emissions are a driving factor producing climate change that can be observed today (Blunden 2011; IPCC 2007; Stern 2006). The major difficulty for the general public in understanding climate change is the confusion between weather and climate. Weather is the day-to-day cloudiness, rainfall, and hot or cold spells that we deal with on a daily basis. Climate is the sum total of the weather that occurs over a long period of time. Even in the absence of climate change, there are significant variations in the weather at a given location. It is only when there is a continuous long-term trend in the weather that climate change begins to occur. Average temperature is one metric used to assess climate change; however, other valid metrics exist, including changes in precipitation patterns, changes in the average occurrence of first day of frost in the autumn and the last day of frost in the spring, temperature changes of the ocean, loss of habitat, creation of new habitat for wildlife due to changing environmental conditions, and the rate of melting of ice caps.

The effort to quantify climate change appears deceptively simple when only the climate change metric of temperature is used. However, even when using only this single metric there are still many complications and uncertainties that make predictive analysis extremely difficult to perform. These include the effects of urbanization that produce what is called an urban heat island effect, change in measurement techniques from mercury thermometers to digital instrument, movement of measurement stations eliminating long timeline trends at a single station, and estimating temperatures for periods before man began making measurements. As an example, climate change could increase mean summer daytime maximum temperature while decreasing mean winter minimum temperatures, thereby producing a simple annual average temperature with no net change when in fact there was substantial change in temperature. All these factors, and many more, must be accounted for if accurate estimating of temperature trends is to occur.

Researchers focused on quantification of past and ongoing climate change are presented with the extremely difficult challenge of producing an unbiased estimate of the trend in temperature (or other metric) and then separating any observed climate change signal into that due to natural climatic variability and that due to anthropogenic GHG emissions. There is currently inadequate knowledge to be able to assign accepted values to all the variables that contribute to climate

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[1] A GCM is a large integrated computer program that attempts to encode into a single set of mathematical formulas the laws of the physics and chemistry that govern the general circulation of the earth's atmosphere and ocean. GCMs are the primary tool used by climate scientists to examine potential impacts of future climate change on the earth's atmosphere and ocean.

change and its impact on sea level, and then to predict its effect at a particular location multiple decades into the future.

2) General Circulation Models are subject to a number of innate limitations that limit their ability to produce the quantitative precision in numerical estimates of climate change metrics that are necessary to assess climate change impacts at any particular location and potential mitigation strategies that may be appropriate.

General Circulation Models are the primary tools that are used to estimate the effects on climate of increased GHGs in the atmosphere. GCMs, while extremely powerful, are innately uncertain for a number of reasons, with three discussed here. First, GCMs use simplified versions of the equations governing atmospheric and oceanic physics to remove smaller scale motions reflecting day-to-day weather events. These small scale motions are often left out, or simply approximated (parameterized) in GCMs (Bader 2008). The reasons for the need for approximations include, among other things, limitations in computer capability, lack of complete understanding of the physical processes at work, and lack of available data to accurately describe the phenomena being parameterized.

A second source of uncertainty is the methodology used to simplify and encode the necessary physical equations into computer code. Unlike solving a simple algebraic equation where a single answer results from solving the equation, the numerical solution of the equations governing the atmosphere and ocean movements can vary dramatically depending on the time step and grid spacing choices used to solve the equations in the GCM (Bader 2008; Randall 1994).

Lastly, the earth’s climate is inherently non-linear, where small changes can produce much more significant climatic changes. For example, catastrophic melting of the Greenland ice sheet within the span of a few years has the potential to produce an immediate and fundamental change in global sea levels and alter the climate of Western Europe as fresh water from melting ice sheet floods into the North Atlantic Ocean and disrupts the warm Gulf Stream (IPCC 2007). Conversely, failure of ice sheet melting to occur would have an equally significant moderating effect on impacts created by global warming. Another example of non-linearity is the sensitivity of climate change to incremental emissions of individual GHGs. CO_2 is relatively abundant in the atmosphere, so there tends to be a small response to adding a small increment of CO_2. By contrast, chlorofluorocarbons (CFCs) are less abundant in the atmosphere and so produce a larger response. However, as humans add more and more CFCs to the atmosphere, the heating contribution from CFCs decreases over time, i.e. the climate’s sensitivity to CFCs has decreased (Feichter 2004). These non-linear responses are very difficult for GCMs to capture accurately and no accepted methodology exists which fully accounts for these and other non-linear effects.

While GCMs have some major limitations, as discussed above, they can have significant value in predicting future climatic changes on a large temporal and spatial scale. An example would be examination of climate change on a global scale. As discussed by Bader (2008), GCMs at this scale have been able to “successfully simulate a growing set of processes and phenomena.”

GCMs, however, are much less successful in demonstrating skill in assessing local climate change. California poses a particularly difficult challenge because of the rapid changes in topography and land use in short horizontal distances that have a strong effect on regional climate. If a model has the spatial resolution of 100 square kilometers, it will average the elevation within that 100 square kilometers and predict climate in a location using that average elevation. For example, if it is attempting to resolve local climate near Santa Barbara where elevation may range from sea level to 1,500 feet above sea level, all calculations for the climate of Santa Barbara will be calculated at an elevation of approximately 750 feet above sea level and will assume dry land for the land use when a significant portion of the grid cell may be ocean at sea level. Clearly, the impact of the coastal environment and the mountain top influences on climate are lost by the spatial averaging in this case.

Local climate predictions can be modeled in more detail using a technique known as downscaling. A downscaled model is a regional-scale model focused on a specific area of interest. These models represent topography much more realistically, and can provide more detail regarding climate on a local level, but operation of such models depends, in part, on the predictions of a GCM at the periphery of the regional model modeling domain. These domain boundary data are called boundary conditions and implicitly contain all the underlying assumptions in the larger-scale GCM (Bader 2008). In effect, a downscaled model is a regional model imbedded, or nested, within a GCM.

Regional climate models are thus biased to the extent that they inherent all the biases that are incumbent in the global scale GCM models (Bader 2008). For example, if El Nino-Southern Oscillation (ENSO) is inadequately modeled in the GCM that supplies the boundary conditions for the regional model, then the regional model will not accurately resolve the effects of ENSO.

Regional models can address very fine details in climate, but they must be tuned to a single phenomenon for study. For example, one model may excel at predicting temperature change, while another may accurately predict mountain snowpack, but no model accurately predicts all aspects of climate. If a researcher is interested in a particular climatic feature (for example, air temperature changes at a local level), the researcher will select a GCM that has demonstrated skill in performing temperature prediction during a validation study called “hindcasting” in which the GCM is simulated using a historical data base and compared to observed historical climate fluctuations (Bader 2008). In effect, the regional model is tuned so that it predicts the metric of interest by using the validated GCM as its foundation. However, if climate change is of a magnitude that its impacts exceed the historical observations, then the model results become significantly more uncertain because the model is being used for a situation outside its validation.

In summary, there is general scientific consensus that the earth’s climate is changing and temperatures are increasing, and GCMs are able to simulate with skill various aspects of climate change. However, it is beyond the capability of GCMs to demonstrate skill in estimating the whole complex of non-linear features that will characterize the impact of climate change at the local level.

3) There is uncertainty in the timing of potential sea level rise due to climate change with the most rapid rise is expected to occur in the latter part of the current century.

The effects of increased CO_2in the atmosphere on sea level rise are not expected to cause rapid change in sea level rise until the latter part of the century. Under different emissions scenarios, model results show a consistent sea level rise until approximately the year 2050 (Cayan 2008; Heberger 2009). Afterwards, the effects of the different emissions scenarios on sea level are more apparent, with the majority of sea level rise in the higher emissions scenarios taking place in the final 25 years of the century (Cayan, 2008; Heberger, 2009; Solomon, 2010). Consequently, the impact of climate change on sea level rise is a non-linear function and may become apparent only many decades in the future, adding to the uncertainty in estimating future sea levels.

4) There is uncertainty in the magnitude of potential sea level rise owing to future climate change due to the inherent inability of GCMs to converge on a single best estimate of potential sea level rise.

Predictions of change in average sea level due to climate change vary greatly. Data show the American West Coast sea level to be rising at the globally averaged rate of 2.2 centimeters per decade, or about 0.72 feet per century (Cayan 2008). However, GCMs have predicted the majority of sea level rise to occur in the latter part of the century. The uncertainty in sea level rise is reflected in multiple studies based on modeling performed using multiple GCMs (Solomon, 2007; Cayan 2008). These review studies have shown sea level rise by the year 2100 may range between 0.18 meters and 1.4 meters (0.6 feet and 4.6 feet) (Heberger 2009), with this range being representative of the 95 percent confidence interval about the mean projected level (Heberger 2009; Solomon 2007). Typically, the 95th percentile confidence interval is taken to include the most likely range of expected outcomes, in this case the outcome being future sea level rise. However, inadequate data exists to choose any particular value within this range as being most likely to occur. For example, the timing of any such rise will depending critically on the stability of ice sheets in Greenland and Antarctica and land-based glaciers, for which no generally-accepted predictive model exists.

5) Future climate change could impact the ENSO2, which is strongly correlated with the strength and frequency of winter storms in Southern California. If future climate change were to produce a change in either the magnitude or frequency of the ENSO, there could be profound, and non-linear, changes in winter storm patterns and coastal flooding events in Southern California.

ENSO is an atmospheric and oceanic oscillation with no well-defined period that has drastic effects on global weather patterns. In Southern California, the ENSO signal is particularly strong and enhances the strength and frequency of winter storms. During El Niño conditions, the eastern Pacific Ocean is warmed drastically by an eastward travelling pulse of warm water known as a Kelvin wave. Over the course of several months, this slow pulse hits the equatorial coast of South America near Ecuador, and then bifurcates and follows the coast north and south. The northern component eventually reaches California, raising coastal water temperatures and increasing sea surface height (Cayan 2008). Also associated with an El Niño event is a southerly swing of the jet stream that increases winter storm activity by directing unusually high amounts of tropical moisture towards Southern California (Andrews 2004). Because of the lack of a well defined period, GCMs have difficulty in accurately representing ENSO strength and phase. While ENSO is a climatic oscillation, it does not have a well defined period, and the processes that initiate a change from a positive phase to a negative phase are not well defined (Kestin 1997). This makes ENSO a particular challenge for climate models to accurately predict, although it is a rapidly evolving area of research (Guilyardi 2003).

The ocean is also a major sink for CO_2, but this absorption depends on water temperature quite strongly, with warmer water absorbing less CO_2. Because ENSO is associated with temperature anomalies over a large portion of the Pacific Ocean, potential changes in ENSO can affect the uptake of $CO_2$by the ocean, another non-linear feedback between the climate and GHGs (Cox 2000). This difficult-to-model feedback further increases uncertainty in GCMs as it is imperative to model ENSO correctly to understand ocean carbon sequestration and predicted atmospheric carbon dioxide levels (Reichenau 2003).

Climate change has the potential to modify the magnitude and frequency of the ENSO in an unknown manner, and such a change can produce a non-linear response in El Niño storm activity affecting Southern California. In summary, the ENSO will have a significant role in any future sea level rise, but no accepted methodology exists to predict the potential response of ENSO to future climate change.

6) Variability in sea level rise impact assessment is compounded by the unknown nature of potential mitigation measures that may be implemented to ameliorate the impacts of sea level rise and the effectiveness of those mitigation measures.

[2] ENSO is a coupled atmospheric-oceanic wave, or oscillation, in the Pacific Ocean Basin that produces a significant global weather impact. The positive phase of an ENSO oscillation is called El Niño and the occurrence of an El Niño condition has dramatic effects on winter storm activity in Southern California.

Human response to climate change and sea level rise is highly unpredictable, as it mixes climate science, engineering capability, and politics, among other factors. Because of the volatile nature of this topic in the public and political setting, responses to climate change and potential sea level rise could vary vastly across local, federal, and international settings. If international and national consensus is reached on the need for action and the appropriate mitigation response, mitigation and adaption measures will be implemented to respond to the more damaging potential threats produced by climate change. However, due to the non-linear nature of potential responses to continued GHG emissions, the future response of the climate to incremental changes in GHG emissions may be different from that which would occur if the emission reductions were to occur today. If sea level rise were to become a reality, local, state, and national governmental bodies would implement steps to protect coastal infrastructure and coastal development from sea level rise. For example, it is expected that if sea level rise were to occur in the future and pose a danger to the Santa Barbara Airport, there would be governmental coastal flood protection measures implemented to protect the airport. Since the proposed property is adjacent to the Santa Barbara Airport, any coastal engineering project designed to protect the airport could reasonably be expected to protect the Project as well.

It is even more problematic to assess potential impacts at a location of a particular structure due to future climate change. The economic lifespan of a current or proposed building, such as the proposed project, is less than 100 years. To maintain economic viability, it is likely that major improvements will be made to the building and property by its owners at some future point. At that time, when there is more certainty as to the reality and magnitude of climate change and sea level rise, the owners would incorporate mitigation measures into their renovation to protect the property from sea level rise if such rise were to occur. However, local flood control efforts that prevent flooding at one location could increase the potential impact of flooding at another nearby location. It is not possible at this time to predict how the various mitigation measures that may be employed well in the future to address potential flooding impacts will affect water levels at any particular property.

To summarize all of the above discussion, scientists agree that climate is changing; however, the degree at which the climate changes, the impacts of climate change, and the human and geologic responses to climate change have a high degree of uncertainty. Quantitative estimates of future climate impacts at any particular site are speculative and not subject to accurate evaluation at this time.

In addition to the speculative nature of inquiry into the impacts of global warming on development projects, there is no requirement under CEQA that such impacts be reviewed. “The purpose of an EIR is to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment” (Public Resources Code section 21061). CEQA defines “environment” as the “physical conditions which exist within the area which will be affected by the proposed project…”(Public Resources Code section 21006.5). Analysis of the impacts associated with locating development in areas where the environment might affect the Project is not mandatory under CEQA (see CEQA Guidelines section 15126.2[a]), and it is well-settled that the CEQA was enacted to protect the environment from the impacts of projects, not to protect projects from the impacts of the environment (*South Orange County Wastewater Authority v. City of Dana Point (2011) 196 Cal.App. 4th 1604, 1617)*. Further analysis of the impact of climate change on the Project is not required.

6.5 Residual Impact

Residual impacts associated with GHG emissions are considered less than significant (Class III).

6.6 References

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Appendix B

Emissions Calculations

Summary of Emissions

Marriott Residence Inn and Hollister Center

Construction Emissions Estimates			
Year	**CO_2e (MT/yr)**	**Potential Significance Threshold (MT/yr)**	**Exceed Significance Treshold? (Yes/No)**
118 Room Construction	526	**900**	No

Operational GHG Emissions [1,2]		
GHG Source	**118 Room Operational Emissions**	
	CO_2e (MT/yr)	**% of Total**
From CalEEMod		
Guest Vehicles (Hotel)[3]	360	38.5%
Solid Waste	29	3.1%
Water and Wastewater	7	0.7%
Landscape Maintenance	1	0.1%
From Marriott Oceanside Data[4]		
Electricity	323	34.5%
Natural Gas Usage	190	20.3%
From Marriott Operations		
Marriott Shuttle Van	4	0.4%
Diesel Emergency Genset Testing	4	0.5%
Amortized Constructoin Emissions		
Construction Emissions	18	1.9%
Total	**936**	100.0%
BAAQMD Significance Threshold	1100	
Exceed Significance Threhold? (Yes/No)	**No**	

Notes:

1. The significance thresholds presented hare have not been approved by the City of Goleta and their use in this analysis does not constitute adoption by the City for this or future CEQA reviews
2. Assumes an average annual occupancy of 100%, which is applied to the guest vehicle usage.
3. The CalEEMod trip default factors for a motel were used because the Project does not have a restaurant and only limited meeting spa
4. The annualized Oceanside electricity and natural gas consumption approximates the total electricity natural gas consumption for the Project.

GHG Emissions from Operational Fuel Combustion

Marriott Residence Inn and Hollister Center will utilize an emergency generator and a shuttle van during normal operation of the hotel.
The GHG emissoins are calculated according to methods described in AB32 Mandatory Reporting. Calculation assumptions are outlines below.

Reference Data				
	CO2	CH4	N2O	Reference
Global Warming Potentials	1	21	310	ARB Appendix A
Emission Factors				
Motor Vehicle Gasoline	kg CO2/gallon	g/mile	g/mile	
	8.55	0.0157	0.0101	
Diesel Fuel	kg/gal	g/MMBtu	g/MMBtu	
	10.14	3	0.6	
Unit Conversions				
pounds to metric tonnes	4.54E-04			

Shuttle Van Travel Assumptions							
Vehicle Assumptions		SB Airport		Orchard Supply			
	Source	Miles/Trip	Trips/Day	Miles/Trip	Trips/Day	Days/Week	Weeks/Yr
	Ford E series Van	3.8	4	2.6	1	7	52

GHG Emissions from Shuttle Van Usage							
	Data Inputs			Emissions Calculations			
Vehicles	Number of Vehicles	Assumed Fuel Economy (miles/gal)	Assumed Mileage (mi/yr)	CO2 (MT/yr)	CH4 (MT/yr)	N2O (MT/yr)	CO2e (MT/yr)
Ford E series Van	1.00	20.00	961.60	0.41	0.02	0.01	3.74

GHG Emissions from Customer Vehicles							
	Data Inputs			Emissions Calculations			
Vehicles	Number of Vehicles	Assumed Fuel Economy (miles/gal)	Assumed Mileage[1] (mi/yr)	CO2 (MT/yr)	CH4 (MT/yr)	N2O (MT/yr)	CO2e (MT/yr)
Customer Vehicles	118.00	25.00	882,074	360	0.02	0.00	360

[1]Assumes default factors for motels, as presented in CalEEMod.

GHG Emissions from Emergency Diesel Generator							
Equipment	Data Inputs		Emissions Calculations				
100 kW Emergency Diesel Generator	Fuel Usage (gal/yr)	Assumed Hours of Operation (hr/yr)	Diesel HHV (MMBtu/gal)	CO2 (kg/yr)	CH4 (kg/yr)	N2O (kg/yr)	CO2e (MT/yr)
	8.5	50	0.13871	4309.5	0.177	0.035	4.3

GHG Emissions Electricity and Natural Gas Consumption

Electricity and Nautral Gas Consumption were calucated from actual usages at the Oceanside Marriott Facility.

Actual Oceanside Utility Data			
Start Date	**End Date**	**Natural Gas Usage (Therms)**	**Electricity Usage (kWh)**
8/24/2007	9/26/2007	190	55840
9/25/2007	10/24/2007	2644	64480
10/24/2007	11/26/2007	2675	79840
11/26/2007	12/26/2007	2782	70560
12/26/2007	1/28/2008	3115	70400
1/25/2008	2/26/2008	2932	72320
2/26/2008	3/27/2008	2481	65600
Total		**16819**	**479040**
Days of Measured Utilities		216	
Annual Estimate Usage		**28421.0**	**809488.9**

Calculation Reference Data				
	CO2	**CH4**	**N2O**	**Reference**
Global Warming Potentials	1	21	310	ARB Appendix A
Emission Factors				
Natural Gas	kg/MMBtu	g/MMBtu	g/MMBtu	
	66.83	0.9	0.1	
Electricity	lb/MWh	lb/MWh	lb/MWh	CCAR Version 3.0
	878.87	0.0067	0.0037	
Unit Conversions				
pounds to metric tonnes	4.54E-04			

GHG Emissions from Electricy and Natural Gas Consumption						
	Data Inputs		**Emissions Calculations**			
	kWh/yr	**MWh/yr**	**CO2 (lb/yr)**	**CH4 (lb/yr)**	**N2O (lb/yr)**	**CO2e (MT/yr)**
Electricity	809488.9	809.5	711435.5	5.4	3.0	323.17
	Therms/yr	**MMBtu/yr**	**CO2 (kg/yr)**	**CH4 (kg/yr)**	**N2O (kg/yr)**	**CO2e (MT/yr)**
Natural Gas	28421.0	2842.1	189937.5	2.6	0.3	190.1

GHG Calculation Assumptions

The GHG analysis is based on project specific data, the latest version of the California Emissions Estimator Model (CalEEMod), and calculation methodologies based on the California Air Resources Board's (CARB) *Mandatory Reporting of Greenhouse Gas Emission.* This appendix lists and discusses the assumptions used to calculate the GHG emissions from the construction and operation of the project.

Construction Emissions

The construction emissions were calculated with the CalEEMod model. The following assumptions were embedded into the CalEEMod model to calculate emissions:

- The project is in the Santa Barbara County Air Pollution Control District jurisdiction south of the Santa Ynez range;
- The project is considered a Recreational Hotel with 118 rooms;
- The project site consists of 3.81 acres of land;
- The project will be completely constructed in one year;
- The project will not require mass grading or demolition activities; and
- CalEEMod default factors for vehicle trips and default construction equipment fleets are representative for the project construction.

The CalEEMod output files for construction of the project are provided in **Appendix C**.

Operational Emissions

The operational emissions generated by direct and indirect sources were calculated using a combination of the CalEEMod model, methodologies from the *CARB's Mandatory Reporting of Greenhouse Gas Emissions* Regulations, and engineering calculations based on operational data from a hotel similar to the proposed project. The CalEEMod model was only used to calculate the GHG emissions associated with project-generated traffic and area source emissions from landscaping.

The following assumptions were embedded into CalEEMod:

- The project is considered a Recreational Hotel with 118 rooms;
- The trip generating module used the default factors for a motel as the description better fits the visiting demographic;
- A calculated peak occupancy factor for the city of Goleta of 100 percent;
- Defaults were used for all other values, including water and waste GHG emissions; and
- Vegetation change and mitigation factors, which were ignored.

The CalEEMod output files used to estimate operational emissions (except energy usage) for the Project are provided in **Appendix C**. The population density calculations used to estimate hotel occupancy are provided in **Appendix E**.

The emissions associated with consumption of fossil fuels for space and water heating systems and electricity consumption were approximated by extrapolation from operational utility usages and computed GHG emissions from the Oceanside Marriott Residence Inn hotel that was fully operational in 2007. The CARB methodology along with the Oceanside data were used to calculate the additional GHG emissions associated with the facility. The following assumptions were made for indirect emissions due to electricity usage, natural gas consumption, and operation of Hotel vehicles:

- The Project is in the same climatic zone as the Oceanside Marriott Residence Inn and hence has similar climatic driver for energy usage (See **Appendix D**);
- The utility usage at the 125 room Oceanside Marriott Residence Inn is representative of the usage at the118 room Project;
- The Project operates a Ford E series van that has a fuel economy of 20 mpg and travels approximately 18 miles per day, 365 days per year; and
- A 100 kW emergency diesel generator is used 50 hours per year for maintenance and testing purposes.

Engineering calculations were used to estimate emissions from the emergency generator and the van. The detailed emissions calculations are provided in **Appendix B**.

Appendix C

CalEEMod Report

R.D. Olson - Marriott - All GHG Emissions

Santa Barbara-South of Santa Ynez Range County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Hotel	118	Room

1.2 Other Project Characteristics

Urbanization Urban

Wind Speed (m/s) 2.7

Utility Company Southern California Edison

Climate Zone 8

Precipitation Freq (Days) 37

1.3 User Entered Comments

Project Characteristics -

Land Use - Acreage reflects slightly smaller plot plan (3.81) as indicated in the site plans.

Construction Phase - Total Construction is expected to take 1 year. Demolition and mass grading will not be required. Grading and demolition removed, and all time lengths reduced by approximately 10%.

Vehicle Trips - Entered vehicle trips for Motel instead of Hotel, as this will not have many meeting places and no restaurant. This fits motel better.

Construction Off-road Equipment Mitigation -

Energy Mitigation -

Water Mitigation -

Energy Use -

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
□ear	tons/yr										MT/yr					
201□											0.00	525.1□	525.1□	0.05	0.00	52□.22
Total											**0.00**	**525.14**	**525.14**	**0.05**	**0.00**	**526.22**

Mitigated Construction

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
□ear	tons/yr										MT/yr					
201□											0.00	525.1□	525.1□	0.05	0.00	52□.22
Total											**0.00**	**525.14**	**525.14**	**0.05**	**0.00**	**526.22**

2.2 Overall Operational

Unmitigated Operational

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Area											0.00	0.00	0.00	0.00	0.00	0.00
Energy											0.00	82□.□0	82□.□0	0.03	0.01	835.0□
Mobile											0.00	35□.□0	35□.□0	0.02	0.00	3□0.3□
Waste											13.12	0.00	13.12	0.78	0.00	2□.3□
Water											0.00	□.11	□.11	0.00	0.00	□.□2
Total											**13.12**	**1,195.91**	**1,209.03**	**0.83**	**0.01**	**1,231.74**

2.2 Overall Operational

Mitigated Operational

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Area											0.00	0.00	0.00	0.00	0.00	0.00
Energy											0.00	7□2.57	7□2.57	0.03	0.01	7□7.2□
Mobile											0.00	35□.□0	35□.□0	0.02	0.00	3□0.3□
Waste											13.12	0.00	13.12	0.78	0.00	2□.3□
Water											0.00	□.11	□.11	0.00	0.00	□.□2
Total											**13.12**	**1,128.58**	**1,141.70**	**0.83**	**0.01**	**1,163.99**

3.0 Construction Detail

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2014

Unmitigated Construction On-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
□ugitive Dust											0.00	0.00	0.00	0.00	0.00	0.00
Off-Road											0.00	18.13	18.13	0.00	0.00	18.17
Total											**0.00**	**18.13**	**18.13**	**0.00**	**0.00**	**18.17**

Unmitigated Construction Off-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	0.38	0.38	0.00	0.00	0.38
Total											**0.00**	**0.38**	**0.38**	**0.00**	**0.00**	**0.38**

3.2 Site Preparation - 2014

Mitigated Construction On-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
□ugitive Dust											0.00	0.00	0.00	0.00	0.00	0.00
Off-Road											0.00	18.13	18.13	0.00	0.00	18.17
Total											**0.00**	**18.13**	**18.13**	**0.00**	**0.00**	**18.17**

Mitigated Construction Off-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	0.38	0.38	0.00	0.00	0.38
Total											**0.00**	**0.38**	**0.38**	**0.00**	**0.00**	**0.38**

3.3 Building Construction - 2014

Unmitigated Construction On-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	37□.28	37□.28	0.0□	0.00	380.12
Total											**0.00**	**379.28**	**379.28**	**0.04**	**0.00**	**380.12**

Unmitigated Construction Off-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	□3.2□	□3.2□	0.00	0.00	□3.2□
Worker											0.00	□2.3□	□2.3□	0.00	0.00	□2.□□
Total											**0.00**	**105.62**	**105.62**	**0.00**	**0.00**	**105.75**

3.3 Building Construction - 2014

Mitigated Construction On-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	37□.28	37□.28	0.0□	0.00	380.12
Total											**0.00**	**379.28**	**379.28**	**0.04**	**0.00**	**380.12**

Mitigated Construction Off-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	□3.2□	□3.2□	0.00	0.00	□3.2□
Worker											0.00	□2.3□	□2.3□	0.00	0.00	□2.□□
Total											**0.00**	**105.62**	**105.62**	**0.00**	**0.00**	**105.75**

3.4 Paving - 2014

Unmitigated Construction On-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	17.□2	17.□2	0.00	0.00	17.□7
Paving											0.00	0.00	0.00	0.00	0.00	0.00
Total											**0.00**	**17.42**	**17.42**	**0.00**	**0.00**	**17.47**

Unmitigated Construction Off-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	1.3□	1.3□	0.00	0.00	1.3□
Total											**0.00**	**1.34**	**1.34**	**0.00**	**0.00**	**1.34**

3.4 Paving - 2014

Mitigated Construction On-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.00	17.□2	17.□2	0.00	0.00	17.□7
Paving											0.00	0.00	0.00	0.00	0.00	0.00
Total											**0.00**	**17.42**	**17.42**	**0.00**	**0.00**	**17.47**

Mitigated Construction Off-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	1.3□	1.3□	0.00	0.00	1.3□
Total											**0.00**	**1.34**	**1.34**	**0.00**	**0.00**	**1.34**

3.5 Architectural Coating - 2014

Unmitigated Construction On-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.00	0.00	0.00	0.00	0.00	0.00
Off-Road											0.00	2.0□	2.0□	0.00	0.00	2.05
Total											**0.00**	**2.04**	**2.04**	**0.00**	**0.00**	**2.05**

Unmitigated Construction Off-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	0.□□	0.□□	0.00	0.00	0.□□
Total											**0.00**	**0.94**	**0.94**	**0.00**	**0.00**	**0.94**

3.5 Architectural Coating - 2014

Mitigated Construction On-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.00	0.00	0.00	0.00	0.00	0.00
Off-Road											0.00	2.0□	2.0□	0.00	0.00	2.05
Total											**0.00**	**2.04**	**2.04**	**0.00**	**0.00**	**2.05**

Mitigated Construction Off-Site

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.00	0.00	0.00	0.00	0.00	0.00
Vendor											0.00	0.00	0.00	0.00	0.00	0.00
Worker											0.00	0.□□	0.□□	0.00	0.00	0.□□
Total											**0.00**	**0.94**	**0.94**	**0.00**	**0.00**	**0.94**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.00	35□.□0	35□.□0	0.02	0.00	3□0.3□
Unmitigated											0.00	35□.□0	35□.□0	0.02	0.00	3□0.3□
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hotel	□□□.3□	□□□.3□	□□□.3□	882,07□	882,07□
Total	□□□.3□	□□□.3□	□□□.3□	882,07□	882,07□

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-□W	H-W or C-W	H-S or C-C	H-O or C-□W
Hotel	8.80	□.□0	□.□0	1□.00	□2.00	1□.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

Exceed Title 2□

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.00	□77.51	□77.51	0.02	0.01	□80.50
Electricity Unmitigated											0.00	502.85	502.85	0.02	0.01	50□.00
□aturalGas Mitigated											0.00	285.0□	285.0□	0.01	0.01	28□.7□
□aturalGas Unmitigated											0.00	327.05	327.05	0.01	0.01	32□.0□
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	□aturalGas Use	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Land Use	k□TU	tons/yr										MT/yr					
Hotel	□.128□□e□00□											0.00	327.05	327.05	0.01	0.01	32□.0□
Total												**0.00**	**327.05**	**327.05**	**0.01**	**0.01**	**329.04**

5.2 Energy by Land Use - NaturalGas

Mitigated

	□aturalGas Use	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Land Use	k□TU	tons/yr										MT/yr					
Hotel	5.3□17□e□00□											0.00	285.0□	285.0□	0.01	0.01	28□7□
Total												**0.00**	**285.06**	**285.06**	**0.01**	**0.01**	**286.79**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	ROG	□Ox	CO	SO2	Total CO2	CH□	□2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
Hotel	1.72878e□00□					502.85	0.02	0.01	50□.00
Total						**502.85**	**0.02**	**0.01**	**506.00**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	ROG	□Ox	CO	SO2	Total CO2	CH□	□2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
Hotel	1.□□1□□e□00□					□77.51	0.02	0.01	□80.50
Total						**477.51**	**0.02**	**0.01**	**480.50**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated											0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products											0.00	0.00	0.00	0.00	0.00	0.00
Landscaping											0.00	0.00	0.00	0.00	0.00	0.00
Total											**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	ROG	□Ox	CO	SO2	□ugitive PM10	Exhaust PM10	PM10 Total	□ugitive PM2.5	Exhaust PM2.5	PM2.5 Total	□io- CO2	□□io- CO2	Total CO2	CH□	□2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products											0.00	0.00	0.00	0.00	0.00	0.00
Landscaping											0.00	0.00	0.00	0.00	0.00	0.00
Total											**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

	ROG	□Ox	CO	SO2	Total CO2	CH□	□2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					□.11	0.00	0.00	□.□2
Unmitigated					□.11	0.00	0.00	□.□2
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

7.2 Water by Land Use

Unmitigated

	□ndoor/Outdoor Use	ROG	□Ox	CO	SO2	Total CO2	CH□	□2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
Hotel	2.□□328 / 0.332587					□.11	0.00	0.00	□.□2
Total						**6.11**	**0.00**	**0.00**	**6.92**

7.2 Water by Land Use

Mitigated

	□ndoor/Outdoor Use	ROG	□Ox	CO	SO2	Total CO2	CH□	□2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
Hotel	2.□□328 / 0.332587					□.11	0.00	0.00	□.□2
Total						**6.11**	**0.00**	**0.00**	**6.92**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	ROG	□Ox	CO	SO2	Total CO2	CH□	□2O	CO2e
	tons/yr				MT/yr			
Mitigated					13.12	0.78	0.00	2□.3□
Unmitigated					13.12	0.78	0.00	2□.3□
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	ROG	□Ox	CO	SO2	Total CO2	CH□	□2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Hotel	□□.□1					13.12	0.78	0.00	2□.3□
Total						**13.12**	**0.78**	**0.00**	**29.39**

Mitigated

	Waste Disposed	ROG	□Ox	CO	SO2	Total CO2	CH□	□2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Hotel	□□.□1					13.12	0.78	0.00	2□.3□
Total						**13.12**	**0.78**	**0.00**	**29.39**

9.0 Vegetation

Appendix D

Climatic Zone
Meteorological Analysis

Appendix D
Climatological Analysis of the Project Site

The California Building Code Title 24 (2008) defines the climatological data to be used for energy efficiency analyses as part of the 2008 California Building Code (CBC) (CEC, 2009). Figure 1 presents the climatological regions in California defined in the 2008 CBC. The Project, located in Goleta, is within Climatological Zone 6, comprising Coastal Santa Barbara, Ventura, Los Angeles, and Orange Counties from Point Conception to the San Diego county line).

This appendix presents a graphical analysis and comparison of the Design Day meteorological conditions for Zone 6 with those in:

- Zone 7 (Coastal San Diego County),
- That portion of Zone 4 in Santa Clara County,
- Inland areas of Los Angeles and Ventura Counties (Zones 9),
- Inland areas of Los Angeles and Orange Counties (Zone 8), and
- Those counties comprising the Bay Area Air Quality Management District (Zones 2, 3, 4, and 12).

The Project site climatology, based on the Design Day data for the Santa Barbara Airport, is compared to that in Zone 7 because electrical and natural gas usage data from a comparable hotel in the Oceanside area is used to represent expected energy use for the Project hotel. A comparison of the Design Day data for the Santa Barbara airport is compared to the metropolitan Los Angeles (Zones 8 and 9) area and the BAAQMD geographic area (Zones 2, 3, 4, and 12) in order to determine the climatological comparability of the Project site area to the counties comprising the BAAQMD and the inland area of Los Angeles and Orange Counties. The objective of this analysis is to demonstrate:

1. The climatological regime for Oceanside (Zone 7) is comparable to that for Goleta -Santa Barbara and therefore the energy use data for a comparable hotel in Oceanside is applicable and appropriate for estimating energy use at the Project hotel.
2. The Goleta -Santa Barbara area has Design Day conditions that are closer to those of the BAAQMD geographic area than those of the Los Angeles-Orange County area and therefore, a GHG emission threshold promulgated by the BAAQMD is applicable to the Project area, based on climatological conditions.

Meteorological Variables Used

The meteorological variables defined under the CBC 2008 are given in Table D-1. There are two primary types of data presented: the dry bulb temperature and the wet bulb temperature. The dry bulb temperature is the actual temperature measured at an observing site, with a higher temperature producing a higher summer cooling demand and a lower temperature producing a higher winter heating demand. The wet bulb temperature is a measure of the moisture content of the air and is used to compute the relative humidity. A higher wet bulb temperature indicates more moisture in the atmosphere, and requires more heating and cooling energy demand to deal with the moisture to produce a more comfortable living and working space.

The metrics used in the comparison of the Design Day meteorological variables are the 95th percentile confidence limits of the variables in each climatic zone. The 95th percentile confidence limits are a statistical measure of the variation of the data in the analyzed data set. Statistically speaking, the 95th percentile confidence limits for a given variable define the range of the observed variables within a distribution such that there is only a 5% probability that the value of a variable at a given site within the distribution will fall outside the 95th percentile confidence limits as a result of chance. In more common usage, but not in a strict statistical sense, the 95th percentile confidence limits can approximate the limits of the range of a variable.

Table D-1. Definition of Design Day Meteorological Variables

Variable	Definition
DB 0.x%	Dry bulb temperature. Summer cooling demand is determined by the high dry bulb temperature. Winter heating demand is determined by the low dry bulb temperature. The dry bulb temperature exceeds (is less than) the listed value only 0.x% of the time in the summer (winter).
Design WB 0.x%	Design wet bulb temperature. The wet bulb temperature is a measure of the moisture in the air and is used to compute relative humidity. Higher moisture content requires more cooling demand in the summer and more heating demand in the winter to remove the moisture in the air. The WB value exceeds the listed value only 0.x% of the time.
MCWB 0.x%	Mean concurrent wet bulb temperature. The wet bulb temperature coincident with the DB 0.x% temperature. Higher moisture content requires more summer cooling to remove the moisture from the air.
Winter Median of Extremes	Median extreme low dry bulb temperature for the sites comprising the climatic zone. A lower extreme median low dry bulb temperature value results in more winter heating demand.

Comparison of Zones 6 and 7

Figure D-2 presents a graphical comparison of the winter Design Day meteorological conditions between Santa Barbara (Zone 6) and Coastal San Diego County (Zone 7). The confidence limits for Zone 7 totally encompass the confidence limits for Zone 6 which implies that winter Design Day temperatures in Zone 6 are the same as those in Zone 7. It is noteworthy that the Design Day conditions for the Santa Barbara airport plotted in Figure D-2 are well outside of (lower than) the 95th percentile confidence limits for both zones, indicating cooler winter temperatures at the Santa Barbara airport than in the remainder of coastal California sites comprising Zones 6 and 7 from Point Conception south to the Mexican Border.

Also included in Figure D-2 are plotted design condition values for Oceanside, Marine Corp Base (MCB) Camp Pendleton (an inland site), and MCB Camp Pendleton Ocean site.

Two key observations are notable in Figure D-2. First, Oceanside falls within the distribution for both Zones 6 and 7 indicating that the winter design climatology of Oceanside is comparable to that of the other sites making up Zones 6 and 7 (including Santa Barbara that is a part of Zone 7). Second, the differences between the two closely separated MCB Camp Pendleton sites are greater than those between Oceanside and Santa Barbara. This observation indicates that there are micro-climatic affects at work to produce the observed distributions and their differences.

The results identifiable in Figure D-2 are consistent with the local meteorological and oceanographic factors governing the local climatology of the southern and central California coast. Offshore of central and southern California is a cold-water current that creates a persistent marine inversion that moderates temperatures and produces plentiful fog and coastal stratus clouds along the coastline. These meteorological conditions produce a local climate that is duplicated in numerous locations along the central and south coast, including the Goleta-Santa Barbara area and the Oceanside-MCB Camp Pendleton area. What this figures says is that distance from the coast (i.e., inland versus beach at MCB Camp Pendleton) is more important in determining the local microclimate than is the much larger distance separating the near-beach locations reflected in the Santa Barbara and Oceanside climatological data. The higher winter design temperature results at the MCB Camp Pendleton beach location are also meteorologically consistent. The MCB Camp Pendleton beach site is on the beach and because it subject to more periods of coastal stratus, fog, and marine inversion than do sites slightly further inland from the beach such as Oceanside, it has slightly higher average low temperatures compared to nearby sites.

Figure D-6 presents a graphical comparison of the summer Design day meteorological conditions between Santa Barbara (Zone 6) and Coastal San Diego County (Zone 7). Included in Figure D-6 are individual plotted values for Santa Barbara, Oceanside, and the two MCB Camp Pendleton sites. The 95th percentile confidence limits for Zones 6 and 7 essentially overlap indicating there is no significant difference in summer Design Day conditions between Zones 6 and 7. In addition, the summer design parameters for the four sites are plotted in Figure D-6. The moisture variables for the four sites are all very close in values due to the marine influence, while the temperature variables for the three near coastal sites (Santa Barbara, Oceanside, and MCB Camp Pendleton [inland]) are all close in value and at or below the lower 95th percentile confidence limits for maximum temperature. Again, this plot indicates the comparability of the three-near coast sites due to the meteorological influence of the marine layer and resultant fog and clouds that lower maximum summer temperatures from those at sites farther inland.

The conclusion from review of Figure D-2 and D-6 is that climatologically, there is not a significance difference between the Project site and the Oceanside area, with a result that the climatically-driven energy use in the two areas is expected to be comparable.

Comparison of Zones 6, the Bay Area, and the Los Angeles-Orange County Area.

Figure D-3 presents a graphical comparison of the winter Design Day meteorological conditions between Santa Barbara (Zone 6), the Santa Clara County portion of Zone 4, and the range of conditions in the counties that are a part of the BAAQMD. The winter Design Day values for Santa Barbara airport are within the bounds of the 95th percentile confidence limits for the counties comprising the BAAQMD and are only slightly above those for Santa Clara County. It is noteworthy that the values for Santa Barbara airport are closer to those of Zone 4 than to those of Zone 6, indicating that Zone 4, including Santa Clara County, is a closer fit for the winter Design Day parameters than is the rest of coastal southern California.

Figure D-7 presents a graphical comparison of the summer Design Day meteorological conditions between Santa Barbara (Zone 6), the Santa Clara County portion of Zone 4, and the range of conditions in the counties that are a part of the BAAQMD. The confidence limits for the counties comprising the BAAQMD are much wider than those for either Zone 6 or the Santa Clara County portion of Zone 4, indicating a wide range of temperatures across the BAAQMD, from cold coastal San Francisco to warm inland Solano County. The summer Design Day values for Santa Barbara airport are within the bounds of the 95th percentile confidence limits for the counties comprising the BAAQMD (and outside those for its Zone 6 home).

Figures D-4 and D-5 presents a graphical comparison of the winter Design Day meteorological conditions between Santa Barbara (Zone 6), and the inland portions of Los Angeles and Orange Counties (Zones 8 and 9). In general, Santa Barbara is significantly cooler than the 95th percentile limits for Zones 8 and is slightly cooler than Zone 9. These two figures indicate that Santa Barbara airport is an outlier in southern California in terms of winter Design Day temperatures, being significantly cooler than other coastal or inland areas of southern California.

Figures D-8 and D-9 presents a graphical comparison of the summer Design Day meteorological conditions between Santa Barbara (Zone 6) and the inland portions of Los Angeles and Orange Counties (Zones 8 and 9). Santa Barbara's dry bulb temperatures are significantly cooler than the 95th percentile limits for Zones 8 and Zone 9 by approximately 15°F. The summer Design Day conditions for inland Los Angeles and Orange Counties are therefore not a good representation of the meteorological conditions expected at the project site.

The conclusion from review of Figures D-3 to D-5 and D-6 to D-9 is that the climatological Design Day conditions at the Project site adjacent to Santa Barbara airport are a much closer match to those in the counties comprising the BAAQMD, including Santa Clara County, than they are to other coastal sites in southern California or in the inland areas of Los Angeles and Orange Counties.

Reference

CEC, 2009. Reference Appendices for the 2008 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, December 2008, Revised June 2009. CEC-400-2008-004-CMF.pdf.
Appendix JA2 – Reference Weather/Climate Data, Table 2-3 – Design Day Data for California Cities.

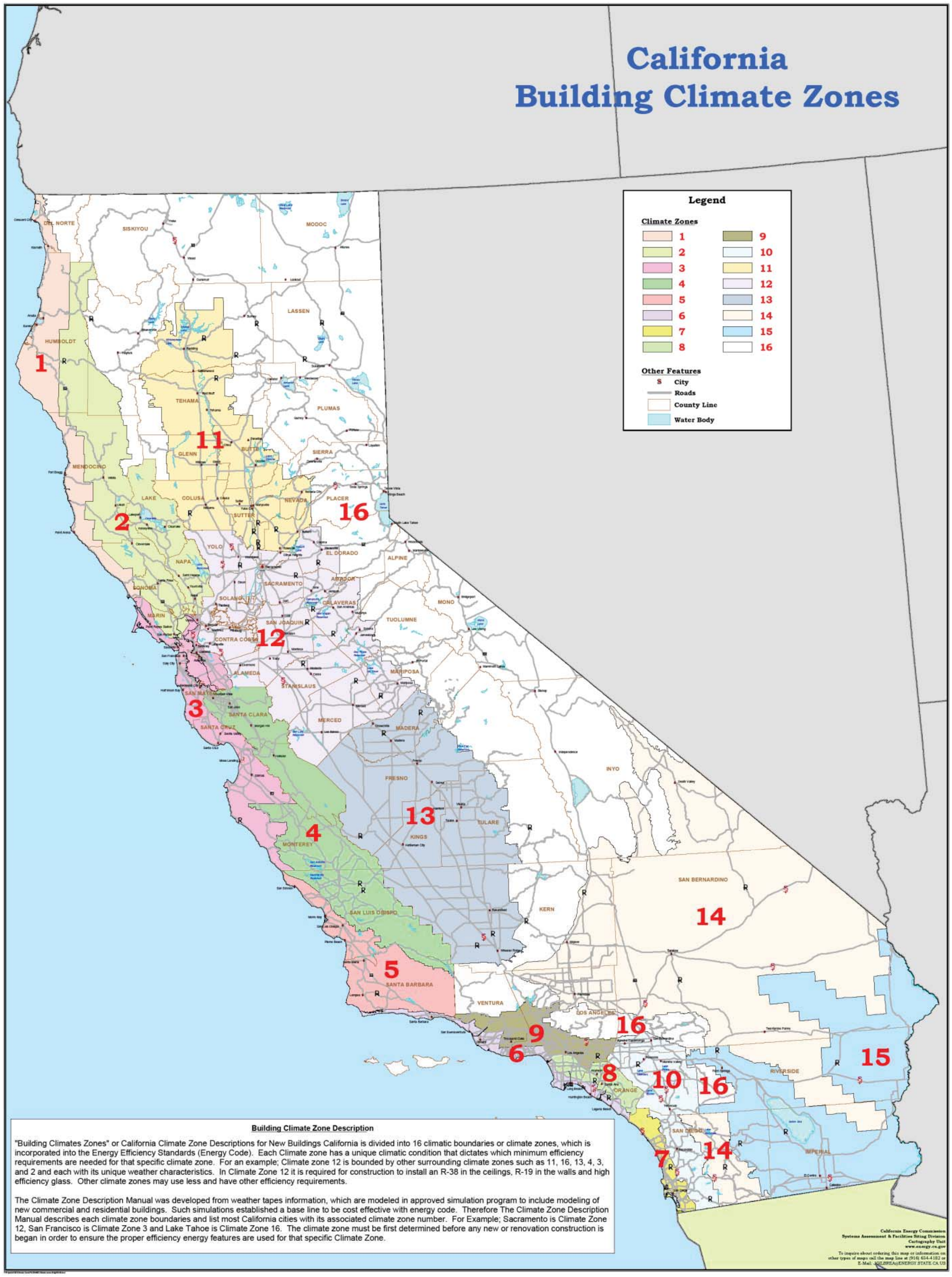

Figure D-1. California Climatic Zones, Title 24 (2008).

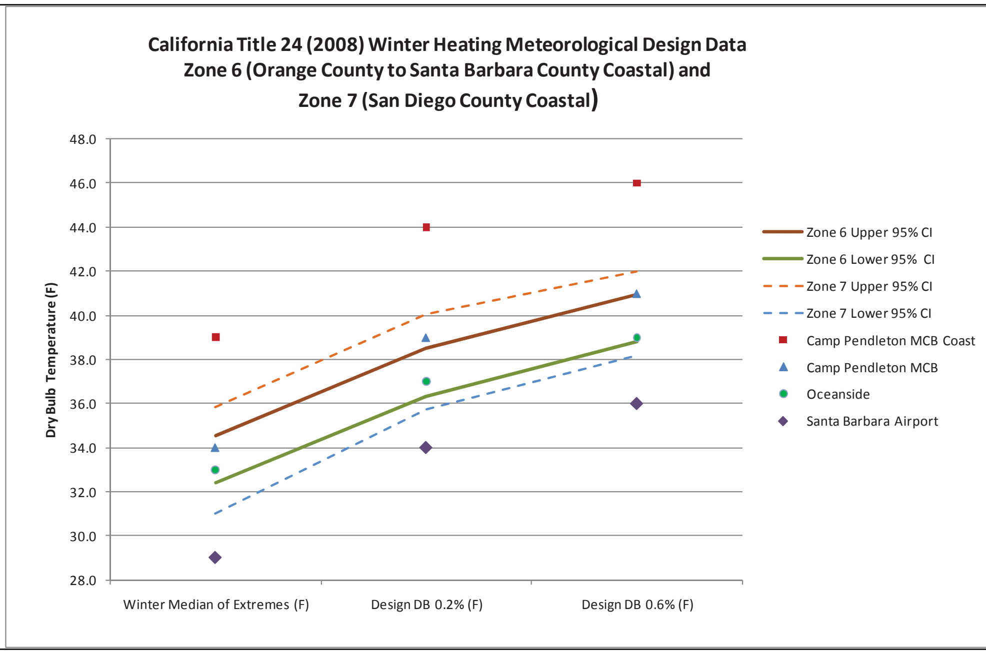

Figure D-2. Winter Heating Demand Variables, Climatic Zones 6 and 7

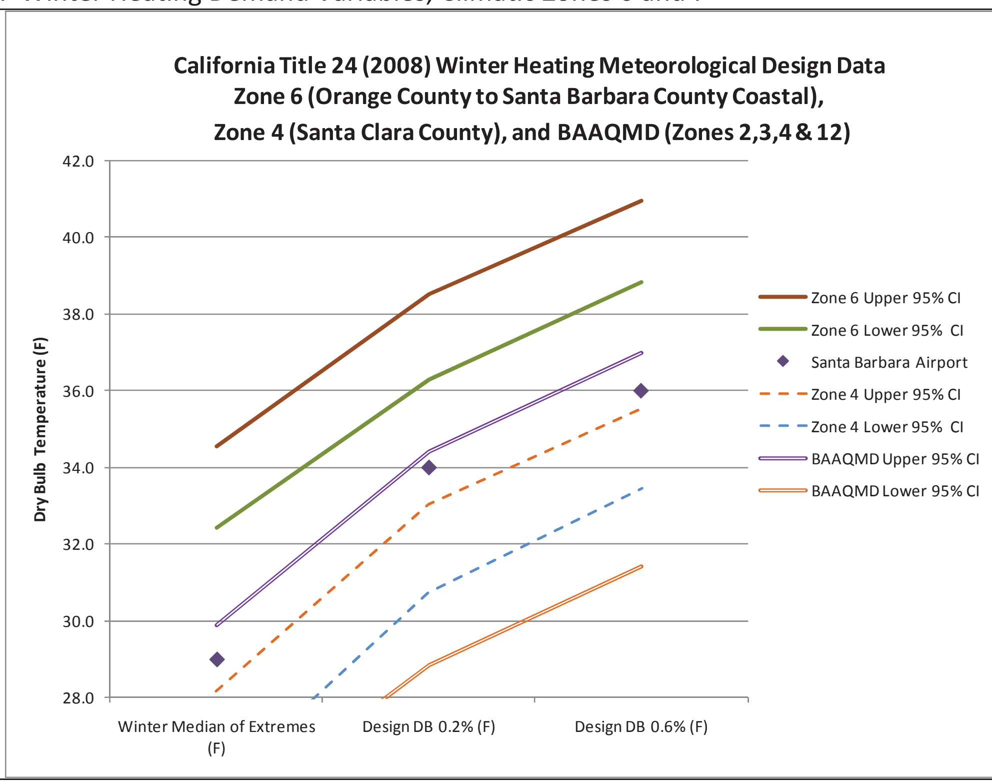

Figure D-3. Winter Heating Demand Variables, Climatic Zones 4, 6, and BAAQMD

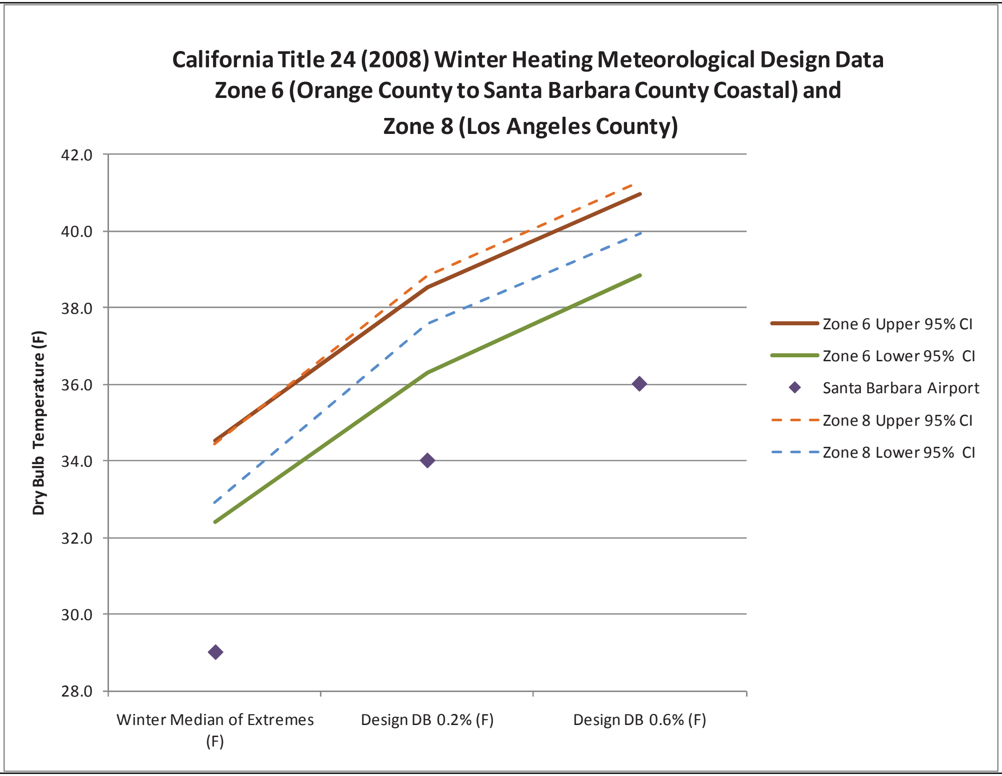

Figure D-4. Winter Heating Demand Variables, Climatic Zones 6 and 8

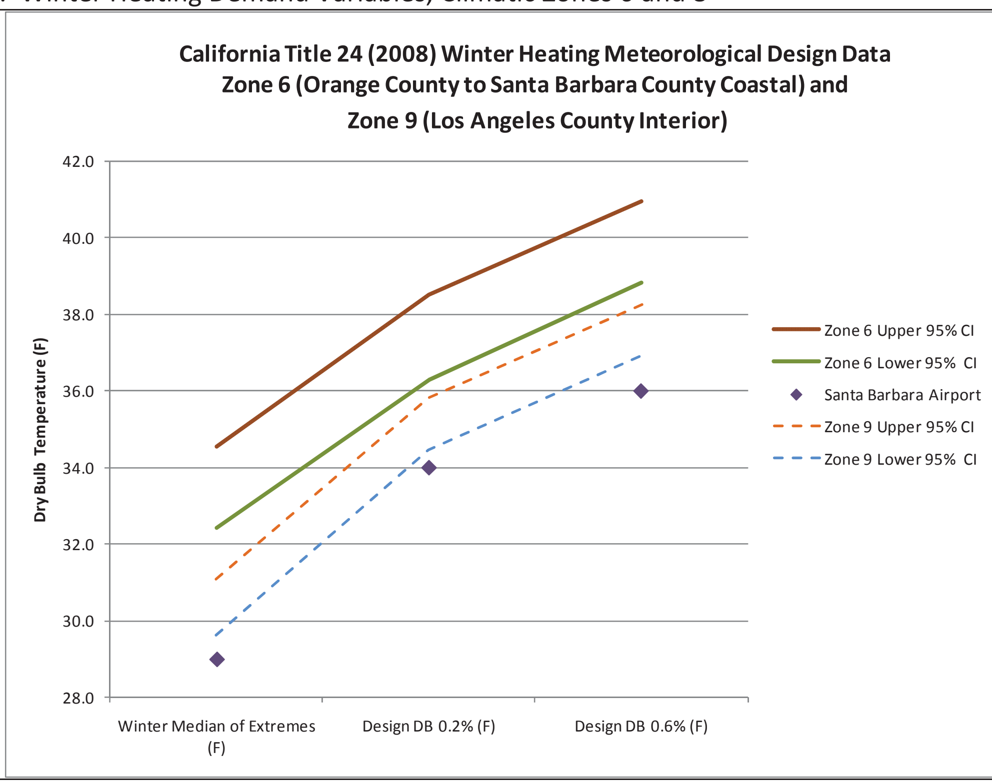

Figure D-5. Winter Heating Demand Variables, Climatic Zones 6 and 9

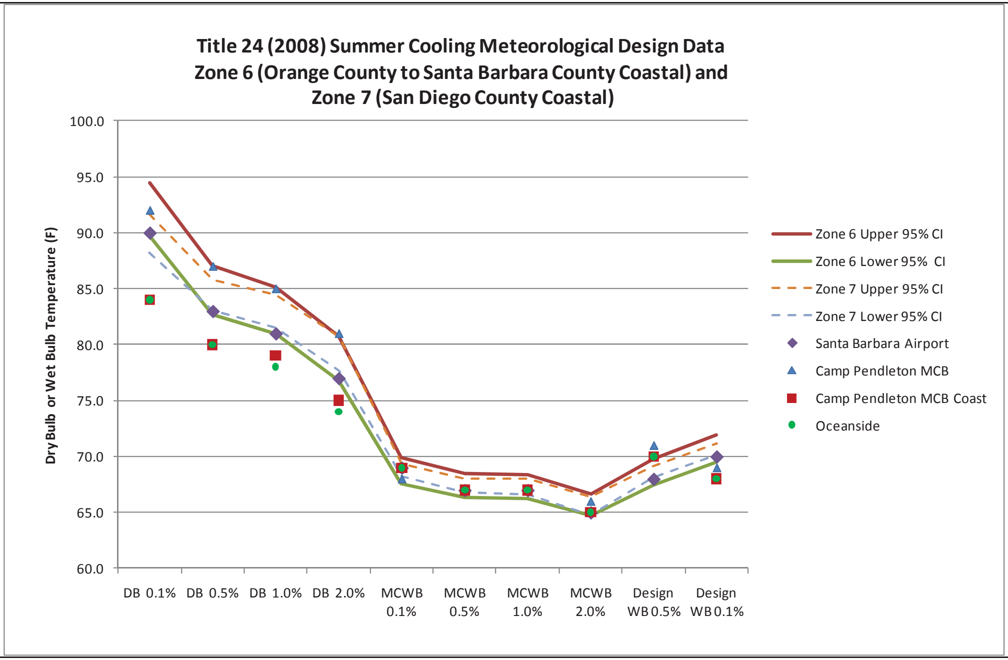

Figure D-6. Summer Cooling Demand Variables, Climatic Zones 6 and 7

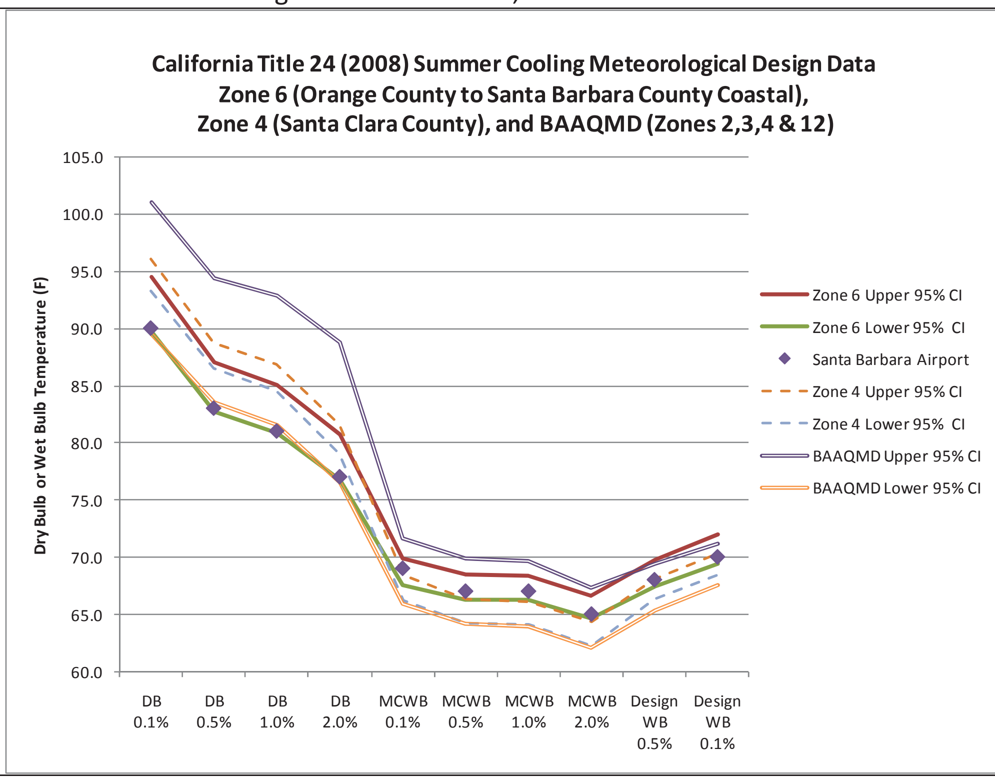

Figure D-7. Summer Cooling Demand Variables, Climatic Zones 4, 6, and BAAQMD

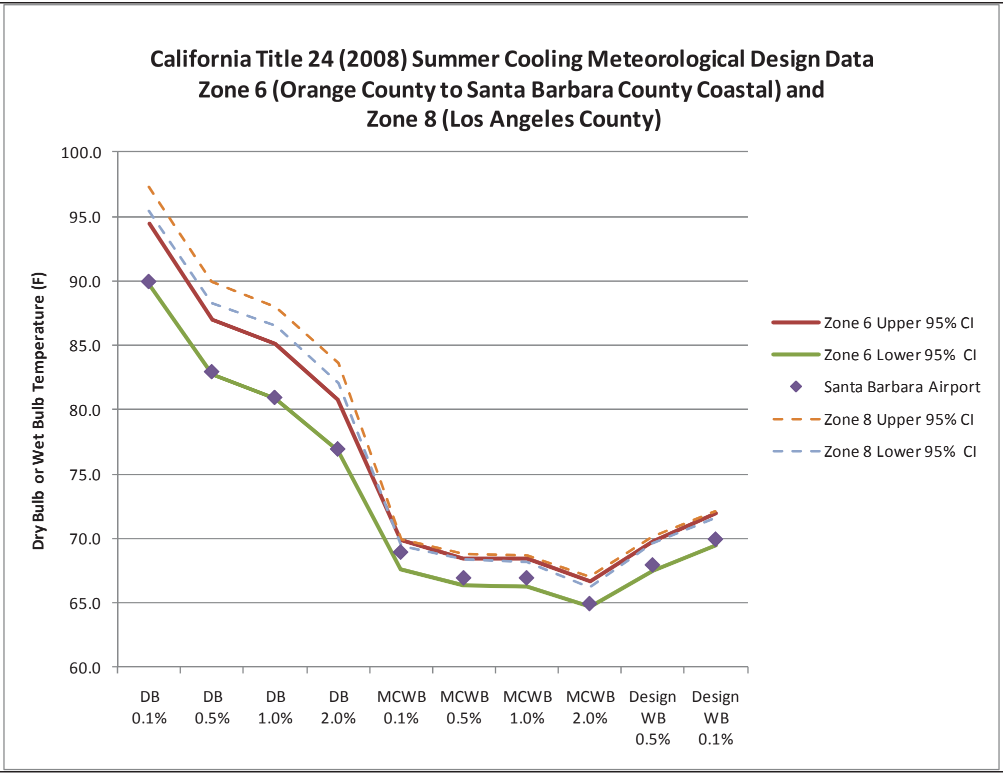

Figure D-8. Summer Heating Demand Variables, Climatic Zones 6 and 8

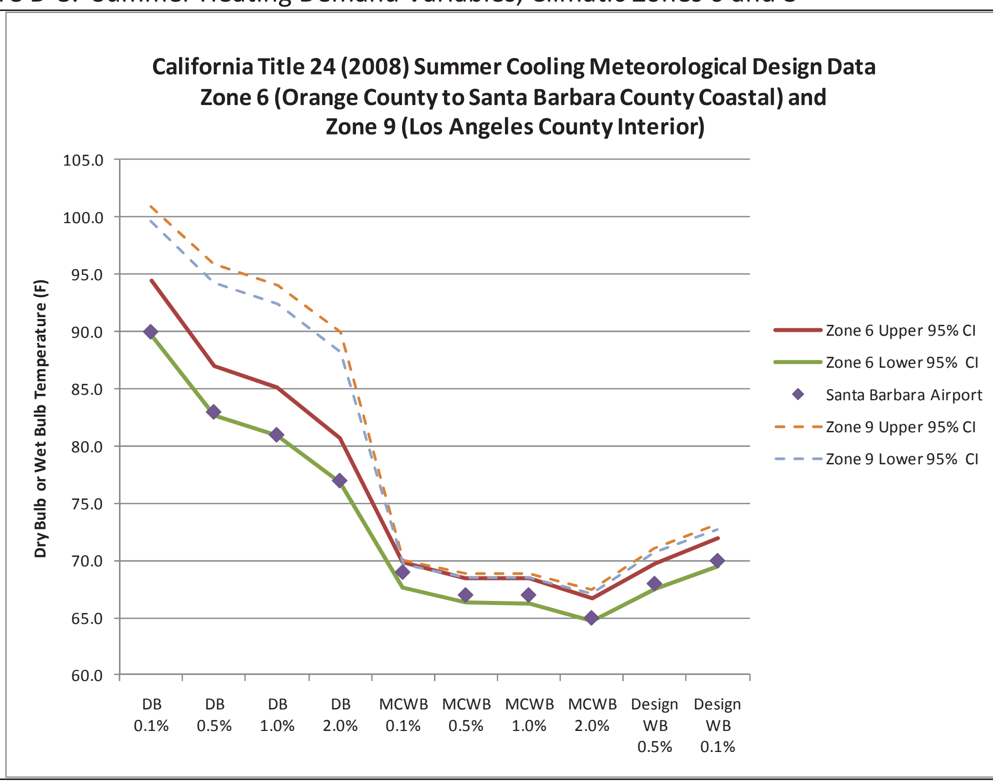

Figure D-9. Summer Heating Demand Variables, Climatic Zones 6 and 9

Appendix E

Occupancy Study

Population Density Calculations

The following three occupancy rates, based on information gathered from area operators and management companies, were used in the following calculations:

- South Coast Average: 73% Occupancy
- Goleta Area Average: 76.2% Occupancy
- Goleta Peak: 87%

Applicant's Calculations:

[((99 rooms)(1.25 persons/room)(73% occupancy))+15 to 18 employees]/3.02 acres =

35 to 36 persons/acre

Using Applicant's Calculations with Average & Peak Occupancy for Goleta:

Average

[((99 rooms)(1.25 persons/room)(76.2% occupancy))+15 to 18 employees]/3.02 acres =

37 to 38 persons/acre

Peak

[((99 rooms)(1.25 persons/room)(87% occupancy))+15 to 18 employees]/3.02 acres =

41 to 42 persons/acre

Per ALUC's Parking Based Calculations:

[((1.5persons/vehicle)(102 to 110 vehicle)(75% capacity))]/3.02 acres =

38 to 41 persons/acre

Staff's Calculations Per ATE's Occupancy Methodology:

[((99 rooms)(1.5 persons/room)(73%; 76.2% or 87% occupancy))+15 to 18 employees]/3.02 acres =

Per South Coast Average ***41 to 42 persons/acre***

Per Goleta Area Average ***43 to 44 persons/acre***

Per Goleta Peak ***48 to 49 persons/acre***

Appendix F

Developer Commitment

R.D.OLSON
DEVELOPMENT

Real Estate Services
Development

March 2, 2012

Ms. Natasha Campbell
c/o Planning and Environmental Services
City of Goleta
130 Cremona Drive, Suite B
Goleta, California 93117

Re: Marriott Residence Inn and Hollister Center

Dear Ms. Campbell:

By letter dated August 20, 2010, we advised you that R.D. Olson Development, applicant for the above-referenced project, was committed to meeting an energy efficiency rating for the project of fourteen percent (14%) above Title 24 2008 standards.

Since the date of that letter, the City of Goleta has adopted both the 2010 Building and related Codes (including the Green Building Code) and an ordinance establishing local energy efficiency standards for buildings and improvements covered by the 2008 California Building Energy Efficiency Standards. Also, it has been determined that the AB 32 goal most relevant to this project is a reduction in energy use of 20% over 2005 Business As Usual energy use. Achieving this goal requires a reduction of GHG emissions over Baseline (2005) Title 24 Building Code of nine percent (9%), in addition to the eleven percent (11%) reduction that will be achieved through implementation of the 2008 Title 24 Building Code standards.

We will accept a condition of approval that requires the project to demonstrate a 20% reduction in energy use over 2006 energy efficiency standards, as well as to comply with the requirements of these two recently-enacted City ordinances. We will demonstrate compliance by documenting the incorporation of energy efficiency measures into the project design that exceed the measures required under Title 24 2008 standards, rather than by computed simulation energy analysis. This approach refines the intent stated in our August 20 letter, but accomplishes that intent through adopted City procedures. Neither our August 20 letter nor this letter states an intention to achieve further energy efficiency beyond the requirements of these new ordinances.

Please contact me if you have questions regarding this matter. Thank you.

Sincerely,

R.D. OLSON DEVELOPMENT

Anthony Wrzosek
Vice President