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## 5.6 Greenhouse Gas Emissions

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This section analyzes the potential air quality impacts related to greenhouse gas (GHG) emissions associated with the proposed Project in terms of short-term construction and long-term operational impacts. The existing setting has been detailed in Section 5.2, Air Quality, and is summarized in this section. Information in this section is based on the Air Quality and Greenhouse Gas Assessment (Air Quality Assessment) prepared by Illingworth & Rodkin, Inc. dated September 7, 2017. The complete Air Quality and Greenhouse Gas Assessment, including appendices, are included herein as Appendix D.

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### 5.6.1 Existing Conditions

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The Project is located in the San Francisco Bay Area Air Basin (SFBAAB) in the Napa Valley. The Valley is bordered by relatively high mountains with an average ridgeline height of approximately 2,000 feet with some peaks approaching 3,000 to 4,000 feet. The mountains are effective barriers to the prevailing northwesterly winds. The Project is in an area currently designated nonattainment for the state 1-hour and 8-hour ozone standards, nonattainment for the state 24-hour and annual PM<sub>10</sub> standard, and nonattainment for the state annual PM<sub>2.5</sub> standard. It is also designated as nonattainment for the national 8-hour ozone standard and nonattainment for the national 24-hour PM<sub>2.5</sub> standard.

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### 5.6.2 Regulatory Setting

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Greenhouse gases (GHG) – gases that trap heat in the atmosphere – regulate the earth’s temperature. This phenomenon, known as the “greenhouse gas effect,” is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide (CO<sub>2</sub>) and water vapor. Other important GHGs are methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). These gases are released into the earth’s atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally:

- CO<sub>2</sub> and N<sub>2</sub>O – byproducts of fossil fuel combustion
- N<sub>2</sub>O – associated with agricultural operations such as fertilization of crops
- CH<sub>4</sub> – commonly created by off-gassing from agricultural practices (e.g., keeping livestock) and landfill operations
- Chlorofluorocarbons (CFCs) – previously widely used as refrigerants, propellants, and cleaning solvents, but their production has been stopped by international treaty
- HFCs – now used as a substitute for CFCs in refrigeration and cooling
- PFCs and sulfur hexafluoride emissions – commonly created by industries such as aluminum production and semi-conductor manufacturing

Each GHG has its own potency and effect upon the earth’s energy balance. This is expressed in terms of a global warming potential (GWP), with CO<sub>2</sub> assigned a value of 1 and sulfur

hexafluoride being several orders of magnitude stronger. In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of CO<sub>2</sub> equivalents (CO<sub>2</sub>e).

Global warming is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates as reported in an expanding body of scientific research. The research also indicates that this trend will continue in the future. California has experienced adverse effects to its climate and naturally occurring resources due to the warming trend. Increased precipitation and sea level rise increases coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress, an increase in climate-sensitive diseases, more frequent and intense natural disasters such as flooding, hurricanes and drought, and increased levels of air pollution.

The earth's climate has always been in the process of changing due to a variety of natural factors, including changes in the earth's orbit, volcanic eruptions, and varying amounts of energy released from the sun. In addition, many human activities have augmented the amount of GHGs being released into the atmosphere, such as burning fossil fuels (coal and oil) and deforestation. Some of the effects of climate change include changes to rainfall, wind and current weather patterns, as well as snow and ice cover and sea level. Global GHG emissions are measured in million metric tons of carbon dioxide equivalent (MMTCO<sub>2</sub>eq) units. A metric ton is approximately 2,205 pounds. Some GHGs emitted into the atmosphere are naturally occurring, while others are caused solely by human activities. The principal GHGs that enter the atmosphere due to human activities are:

- **Carbon dioxide (CO<sub>2</sub>)** enters the atmosphere through burning fossil fuels (oil, natural gas, and coal), agriculture, irrigation, and deforestation, as well as the manufacturing of cement.
- **Methane (CH<sub>4</sub>)** is emitted through the production and transportation of coal, natural gas, and oil, as well as from livestock. Other agricultural activities influence methane emissions as well as the decay of waste in landfills.
- **Nitrous oxide (N<sub>2</sub>O)** is released most often during the burning of fuel at high temperatures. This greenhouse gas is caused mostly by motor vehicles, which also include non-road vehicles, such as those used for agriculture.
- **Fluorinated Gases** are emitted primarily from industrial sources, which often include hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF<sub>6</sub>). Though they are often released in smaller quantities, fluorinated gases are referred to as High Global Warming Potential Gases because of their ability to cause global warming. Fluorinated gases are often used as substitutes for ozone-depleting substances.

These gases have different potentials for trapping heat in the atmosphere, called global warming potential (GWP) gases. For example, 1 pound of methane has 21 times more heat-capturing potential than 1 pound of carbon dioxide. When dealing with an array of emissions,

the gases are converted to carbon dioxide equivalents for comparison purposes. The GWPs for common greenhouse gases are shown in Table 5.6-1 below.

**Table 5.6-1 Global Warming Potential Gases**

Gas	Global Warming Potential (carbon dioxide equivalents)
Carbon dioxide	1
Methane	28
Nitrous oxide	265
Nitrogen trifluoride	16,100
Hydrofluorocarbons	100-12,000
Perfluorocarbons	7,000-11,000
Sulfur hexafluoride (SF <sub>6</sub> )	23,500

Source: CARB, "First Update to the Climate Change Scoping Plan," May 2014

As noted above, long-term environmental impacts of global warming may include sea level rise that could cause devastating erosion and flooding of coastal cities and villages. Locally, global warming could cause changing weather patterns with increased storm and drought severity. Changes to local and regional ecosystems include the potential loss of species and a significant reduction in winter snow pack (e.g., estimates include a 30% to 90% reduction in now pack in the Sierra Nevada mountain range). The California Climate Change Center (2006) predicted that California could witness the following events:

- Temperature rises between 3 °F and 10.5 °F
- 6 to 20 inches or more increase in sea level
- 2 to 4 times as many heat-wave days in major urban centers
- 2 to 6 times as many heat-related deaths in major urban centers
- 1 to 1.5 times more critically dry years
- 10 to 55% increase in the risk of wildfires

An increase in the frequency of extreme events may result in more event-related deaths, injuries, infectious diseases, and stress-related disorders.

Higher temperatures could likely increase electricity demand due to higher air conditioning use. Even if the population remained unchanged, toward the end of the century annual electricity demand could increase by as much as 20% if temperatures rise into the higher warming range. Implementing aggressive efficiency measures could lower this estimate. Higher temperatures may require that the proposed Project consume more electricity for cooling. Additionally, more water may be needed for the landscaping. However, sea level rise will not impact the Project, because it is distant from the ocean.

### Sources of Greenhouse Gases in California

The California Energy Commission (CEC) categorizes GHG generation by source into eight broad categories. The categories are:

1. **Transportation** – includes the combustion of gasoline and diesel in automobiles and trucks. Transportation also includes jet fuel consumption and bunker fuel for ships.

2. **Agriculture** – GHG emissions are composed mostly of nitrous oxide from agricultural soil management, methane from enteric fermentation, and methane and nitrous oxide from manure management.
3. **Commercial and residential** uses generate GHG emissions primarily from the combustion of natural gas for space and water heating.
4. **Industrial** – GHG emissions are produced from many industrial activities. Major contributors include oil and natural gas extraction; crude oil refining; food processing; stone, clay, glass, and cement manufacturing; chemical manufacturing; and cement production. Wastewater treatment plants are also significant contributors to this category.
5. **Electric generation** includes emissions from power plants in California as well as power plants located outside the state that supply electricity to the state.
6. **Recycling and waste** includes primarily landfills.
7. **High global warming potential** emissions consist of ozone-depleting substance substitutes and electricity grid SF6 losses.
8. **Forestry** emissions are due to wildfires.

## 1. Federal Plans, Policies, Regulations, and Laws

The federal government began studying the phenomenon of global warming as early as 1978 with the National Climate Protection Act, 92 Stat. 601, which required the President to establish a program to “assist the Nation and the world to understand and respond to natural and man-induced climate processes and their implications.” The 1987 Global Climate Protection Act, Title XI of Pub. L. 100-204, directed the U.S. EPA to propose a “coordinated national policy on global climate change,” and ordered the Secretary of State to work “through the channels of multilateral diplomacy” to coordinate efforts to address global warming. In 1992, the United States ratified a nonbinding agreement among 154 nations to reduce atmospheric GHGs.

The U.S. EPA (EPA) has several regulatory initiatives to reduce greenhouse gas emissions. On August 3, 2015, the EPA issued the Clean Power Plan, which put the nation on track to cut harmful pollution from the power sector by 32% below 2005 levels, while also cutting smog- and soot-forming emissions that threaten public health by 20%. Previously, on May 13, 2010, EPA set greenhouse gas emissions thresholds to define when permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule “tailors” the requirements of these Clean Air Act permitting programs to limit covered facilities to the nation’s largest greenhouse gas emitters: power plants, refineries, and cement production facilities.

The EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles through reduced greenhouse gas emissions and improved fuel use. Together, the enacted and proposed standards are expected to save more than six billion barrels of oil through 2025 and reduce more than 3,100 million metric tons of carbon dioxide emissions. Additionally, EPA is also responsible for developing and implementing regulations to ensure that

transportation fuel sold in the United States contains a minimum volume of renewable fuel. By 2022, the Renewable Fuel Standard (RFS) program will reduce greenhouse gas emissions by 138 million metric tons, about the annual emissions of 27 million passenger vehicles, replacing about 7% of expected annual diesel consumption and decreasing oil imports by \$41.5 billion.

The EPA has issued two proposals to further reduce GHG emissions from municipal solid waste landfills. The EPA has proposed a suite of requirements that would reduce GHG emissions from the oil and natural gas industry.

## **2. California State Plans, Policies, Regulations, and Laws**

In the past several years, California has distinguished itself as a national leader in efforts to address global climate change by enacting several major pieces of legislation, engaging in multi-national and multi-state collaborative efforts, and preparing a wealth of information on the impacts associated with global climate change.

In November 2008, the Governor issued Executive Order S-13-08 directing state agencies to plan for sea level rise and other climate change impacts. There are four key actions in the Executive Order: 1) initiation of a climate change adaptation strategy that will assess the state's expected climate change impacts where the state is most vulnerable, with recommendations by early 2009; 2) an expert panel on sea level rise will inform state planning and development efforts; 3) interim guidance to state agencies on planning for sea level rise in coastal and floodplain areas for new projects; and 4) initiation of a report on critical existing and planned infrastructure projects vulnerable to sea level rise.

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Global Warming Solutions Act of 2006 (*California Health and Safety Code* §38500, et seq.).

AB 32 codifies the State of California's GHG emissions target by directing California Air Resources Board (CARB) to reduce the state's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, CARB, the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and the Building Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05.

A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State of California's main strategies to reduce GHGs from business-as-usual (BAU) emissions projected in 2020 back down to 1990 levels. BAU is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. It required CARB and other state agencies to develop and adopt regulations and other initiatives reducing GHGs by 2012.

As directed by AB 32, CARB has also approved a statewide GHG emissions limit. On December 6, 2007, CARB staff resolved an amount of 427 million metric tons of CO<sub>2</sub>e

(MMTCO<sub>2</sub>eq) as the total statewide GHG 1990 emissions level and 2020 emissions limit. The limit is a cumulative statewide limit, not a sector-or facility-specific limit. CARB updated the future 2020 BAU annual emissions forecast, in light of the economic downturn, to 545 MMTCO<sub>2</sub>eq. Two GHG emissions reduction measures currently enacted that were not previously included in the 2008 Scoping Plan baseline inventory were included, further reducing the baseline inventory to 507 MMTCO<sub>2</sub>eq. Thus, an estimated reduction of 80 MMTCO<sub>2</sub>eq is necessary to reduce statewide emissions to meet the AB 32 target by 2020.

AB 32 considers the relative contribution of each source or source category to protect adverse impacts on small businesses and others by requiring CARB to recommend a *de minimis* (minimal importance) threshold of GHG emissions below which emissions reduction requirements would not apply. AB 32 also allows the Governor to adjust the deadlines mentioned above for individual regulations or the entire state to the earliest feasible date in the event of extraordinary circumstances, catastrophic events, or threat of significant economic harm.

California has passed several bills, and the Governor has signed at least four executive orders regarding GHG. GHG statutes and executive orders (EO) include AB 32, SB 1368 (Chapter 596, Statutes of 2000), EO S-03-05, EO S-20-06, EO S-01-07 and EO B-30-15. Statewide, the framework for developing the implementing regulations for AB 32 is under way. Maximum GHG reductions are expected to derive from increased vehicle fuel efficiency, greater use of renewable energy, and increased structural energy efficiency. CARB's Scoping Plan (2008) and First Update (May 2014) provide a framework for actions to reduce California's GHG emissions and require CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-global warming potential GHGs in consumer products) and changes to the vehicle fleet (hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., Low Carbon Fuel Standard), among others. Additionally, through the California Climate Action Reserve, general and industry-specific protocols for assessing and reporting GHG emissions have been developed. The California Climate Action Reserve is a program of the Climate Action Reserve committed to solving climate change through emissions accounting and reduction. GHG sources are categorized into direct sources (i.e., company owned) and indirect sources (i.e., not company owned). Direct sources include combustion emissions from on-road and off-road mobile sources and fugitive emissions. Fugitive emissions are defined as gases or vapors emitted from pressurized equipment due to leaks and other unintended or irregular releases of gases, generally from industrial activities. Indirect sources include off-site electricity generation and non-company-owned mobile sources.

### **California's Renewable Energy Portfolio Standard Program (2005)**

In 2002, California established its Renewable Energy Portfolio Standard Program, which originally included a goal of increasing the percentage of renewable energy in the state's electricity mix to 20% by 2017. The state's most recent 2005 Energy Action Plan raises the renewable energy goal from 20% by 2017, to 33% by 2020.

### **Title 24, Part 6, California Code of Regulations (2005)**

In 2005, California adopted new energy efficiency standards for residential and nonresidential buildings to reduce California’s energy consumption. This program has been partially responsible for keeping California’s per capita energy use approximately flat over the past 30 years.

### **Climate Action Registry (2001)**

California Senate Bills 1771 and 527 created the structure of the California Climate Action Registry (Registry), and former Governor Gray Davis signed the final version of the Registry’s enabling legislation into law on October 13, 2001. These bills establish the Registry as a non-profit entity to help companies and organizations establish GHG emissions baselines against which future GHG emissions reduction requirements could be applied. Using any year from 1990 forward as a base year, participants can record their annual GHG emissions with the Registry. In return for this voluntary action, the State of California promises to offer its “best efforts” to ensure that participants receive consideration for their early action if they are subject to any future state, federal, or international emissions regulatory scheme.

## **3. San Francisco Bay Area Plans, Policies, Regulations and Laws**

The Bay Area Air Quality Management District (BAAQMD) has jurisdiction over an approximately 5,600-square-mile area commonly referred to as the San Francisco Bay Area. BAAQMD is the lead agency in developing plans to address attainment and maintenance of National Ambient Air Quality Standards and California Ambient Air Quality Standards. The BAAQMD CEQA Air Quality Guidelines<sup>18</sup> (Guidelines) were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. In June 2010, the BAAQMD’s Board of Directors adopted CEQA thresholds of significance and an update of their CEQA Guidelines. The Guidelines were amended in May 2011 to include a risk and hazards threshold for new receptors and modify procedures for assessing impacts related to risk and hazard impacts.

With regard to GHG emissions analysis, a Qualified GHG Reduction Strategy is a climate action plan that meets certain requirements outlined by BAAQMD, which allows for a consistency analysis of a project’s design features with the goals, policies, and measures of the qualified GHG reduction strategy as opposed to a quantified approach and comparison with thresholds of significance. The City of Napa does not have a Climate Action Plan; therefore, the quantified approach using thresholds of significance was used.

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### **5.6.3 Thresholds of Significance**

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The California Environmental Quality Act (CEQA) Guidelines do not include or recommend any particular threshold of significance. Rather, that decision is left to the discretion of the lead agency. During the development of the CEQA Guidelines Update to address GHG, the

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18 Bay Area Air Quality Management District, 2017. CEQA Air Quality Guidelines. May.

Natural Resources Agency concluded that the CEQA Guidelines do not establish significance thresholds for other potential impacts, and SB 97 did not authorize the development of a statewide threshold as part of the guidelines update.<sup>19</sup>

The California Resources Agency developed guidelines for the treatment of GHG emissions under CEQA in response to requirements of SB 97. The guidelines became state laws under Title 14 of the California Code of Regulations in March 2010. Appendix G of the CEQA Guidelines states that a project would have a potentially significant impact if it:

- a) Generates GHG emissions, directly or indirectly, that may have a significant impact on the environment, or
- b) Conflicts with an applicable plan, policy or regulation adopted to reduce GHG emissions.

Section 15064.4 of the CEQA Guidelines provides that emissions identification may be quantitative, qualitative, or based on performance standards. CEQA Guidelines allow the selection of the model or methodology the lead agency considers most appropriate. Use of a computer model such as CalEEMod is the most common practice for emissions quantification to determine the significance of the emissions. The threshold of significance must take into consideration what level of GHG emissions would be cumulatively considerable. The Guidelines are clear that a zero net emissions threshold is not required. A lead agency may rely on thresholds adopted by another agency with greater expertise if the lead agency has not yet formally adopted its own significance threshold.

### **Bay Area Air Quality Management District**

The significance thresholds contained in the 2011 BAAQMD Air Quality Guidelines were applied to the proposed Project in the Air Quality and Greenhouse Gas Assessment prepared for the Project. The significance thresholds for GHG as presented in the Guidelines require:

- Compliance with a Qualified GHG Reduction Strategy, or
- 1,100 metric tons per year or 4.6 metric tons per capita

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## **5.6.4 Project Impacts Prior to Mitigation**

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Local air quality impacts/emissions are usually divided into short-term and long-term impacts. Short-term impacts are normally the result of demolition, construction, or grading operations. Long-term impacts are associated with the built-out condition of the proposed Project and are the result of the day-to-day operation and maintenance, use of consumer products, natural gas use, and vehicle trips associated with employees, visitors, and hotel guests.

Development of the Project site is anticipated to take approximately 14 months to complete, with construction estimated at approximately 13 months. The work performed will include

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19 “Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97.” California Natural Resources Agency, December 2009. [http://resources.ca.gov/ceqa/docs/Final\\_Statement\\_of\\_Reasons.pdf](http://resources.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf) (accessed 8/23/2017)



general site work and construction of the hotel, the winery, and the office. Site work is anticipated to last 90 days, including grading, site preparation, and utility infrastructure. Work on the hotel is anticipated to be ongoing for the entire 13 months of estimated construction time, with winery and office work anticipated to each take 11 months.

**1. Short-Term Construction GHG Emissions**

The primary source of temporary GHG emissions generated by construction activities is from use of diesel-powered construction equipment. Typical emission rates for construction equipment were obtained using CalEEMod 2016.3.1. The CalEEMod program can be used to estimate emissions including operation (vehicle and area) sources, as well as construction projects associated with land development projects.

The Project will include site preparation, grading, construction of the hotel(s), office building and winery, paving, and painting. It is anticipated that construction will occur over a 19-month period. CalEEMod was used to estimate GHG emissions, which are estimated to be 950 metric tons of CO<sub>2</sub>e (MTCO<sub>2</sub>e) for the total construction period. This number represents emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. The following table depicts the estimated GHG construction emissions over an anticipated 3-year construction time frame. Total construction emissions, which are all below BAAQMD thresholds, are analyzed in Section 5.2, Air Quality. As analyzed, air quality impacts, including construction GHG emissions, are less than significant.

**Table 5.6-2 GHG Construction Emissions**

	<b>Year 2017</b>	<b>Year 2018</b>	<b>Year 2019</b>
Unmitigated GHG emissions	213.9 MTCO <sub>2</sub> e	672.5 MTCO <sub>2</sub> e	63.1 MTCO <sub>2</sub> e

Neither the City of Napa nor the BAAQMD has an adopted threshold of significance for construction-related GHG emissions. The BAAQMD standard is 1,100 metric tons or 4.6 metric tons per capita for total Project emissions. However, BAAQMD recommends quantifying emissions and disclosing that GHG emissions would occur during construction. BAAQMD also encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable. Best management practices assumed to be incorporated into construction of the proposed Project include, but are not limited to, using local building materials of at least 10% and recycling or reusing at least 50% of construction waste or demolition materials. In addition, Mitigation Measure MM AQ-1 (Section 5.2, Air Quality, page 5.2-12) requires implementation of best management practices that minimize idling times and maintaining all equipment to run in property condition.

**2. Long-Term Operational GHG Emissions**

The primary sources of GHG emissions generated by the proposed Project will be from vehicular traffic within the Project vicinity, energy and water usage, and solid waste disposal. The winery component of the proposed Project would result in CO<sub>2</sub> emissions from the fermentation of grapes.

CalEEMod 2016.3.1 was used to estimate GHG emissions from operation of the Project assuming full build-out. Land use types and size and other Project-specific information were input into the model. Two model runs were conducted – one for the hotel uses and one for the office and winery uses –to apply the expected hotel occupancy rate. Annual emissions would be affected by the occupancy of the hotel. Operational mobile, water usage, and solid waste generation emissions associated with the hotel were reduced to adjust for annual occupancy. CalEEMod provides emissions for transportation, area sources, electricity consumption, natural gas combustion, electricity usage associated with water usage and wastewater discharge, and solid waste land filling and transport. An adjustment was made to CalEEMod for GHG modeling. The model has a default rate of 641.3 pounds of CO<sub>2</sub> per megawatt of electricity produced, which is based on PG&E’s 2008 emissions rate. The PG&E rate was updated to the 2020 rate predicted by PG&E, which is 290 pounds of CO<sub>2</sub> per megawatt of electricity produced.<sup>20</sup>

### **Winery Operations**

Emissions from wine fermentation are not included in the CalEEMod modeling program. Although the CO<sub>2</sub> released during fermentation of grapes is considered a biogenic emission, the emissions were included in the GHG analysis. The amount of emissions is dependent on many variables, including the type of wine produced and the winemaking process. The International Wine Carbon Calculator (IWCC version 1.3) is an Excel spreadsheet that provides GHG emissions estimates from various winery operations. This program was utilized to generally estimate CO<sub>2</sub> emissions from fermentation, because specific details of the wine making were not known at the time of the analysis. Assuming approximately 925 tons of grapes would be used to produce 50,000 cases of wine, CO<sub>2</sub> emissions would be approximately 105 metric tons per year.

The Project includes an on-site water treatment feature. The industrial wastewater from the winery will be held in a tank beneath the winery and transferred through an underground piping system to an on-site wastewater treatment area located immediately to the southwest of the winery across an internal drive aisle. The wastewater treatment area will be approximately 2,800 square feet in size and includes three cylindrical water storage tanks and the wastewater treatment system itself, eliminating the need to haul winery wastewater to an off-site location.

### **Service Population Emissions (Employees)**

The Project service population is based on the number of future full-time employees. The hotel will employ up to 50 personnel. The office will employ approximately 120 workers based on an approximate 4 employees per 1,000 square feet. The winery will employ approximately 20 workers. The total service population for the Project was estimated at 190.

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<sup>20</sup> PG&E, Greenhouse Gas Emission Factors: Guidance for PG&E Customers, November 2015. Available online: [https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge\\_ghg\\_emission\\_factor\\_info\\_sheet.pdf](https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf) (accessed 8/23/2017).

### Hotel Occupancy (Guests)

Guest occupancy of the hotel will affect annual GHG emissions. The number of future occupants is estimated at 202 guests, assuming that the hotel operates at 80% occupancy. Operational mobile, water usage, and solid waste generation emissions associated with the proposed hotel(s) were reduced to adjust for annual occupancy.

### 3. Operational Emissions Calculations

The CalEEMod model, along with the Project vehicle trip generation rates, were used to estimate daily emissions associated with the operation of the fully built-out site as proposed. The service population (SP) threshold was used to determine the significance of the Project emissions. In year 2020 (buildout), annual net emissions resulting from the operation of the proposed Project are estimated to be 2,277 metric tons carbon dioxide equivalents (MTCO<sub>2e</sub>) as shown in Table 5.6-3 below.

**Table 5.6-3 Annual Project GHG Emissions**

Source Category	2020 Proposed Project	
	Hotel <sup>1</sup> (metric tons CO <sub>2</sub> equivalents)	Winery and Other (metric tons CO <sub>2</sub> equivalents)
Area	<1	<1
Energy consumption	397	186
Mobile	1,144	323
Solid waste generation	56	30
Water usage	11	25
Fermentation (biogenic)	–	105
Total Project emissions	2,277 MT of CO <sub>2e</sub> per year	
Emissions per capita <sup>2</sup>	12.0	
BAAQMD threshold	1,100 MTCO <sub>2e</sub> per year OR 4.6 MTCO <sub>2e</sub> per capita	
Significant?	Yes	

<sup>1</sup> Assumes 80% occupancy

<sup>2</sup> Based on a service population of 190

As shown above, the Project will result in annual estimated GHG emissions of 2,277 MTCO<sub>2e</sub> per year, which exceeds the BAAQMD threshold of 1,100 MTCO<sub>2e</sub> per year. In addition, emissions of 12.0 MTCO<sub>2e</sub> per capita would exceed the BAAQMD threshold of 4.6 MTCO<sub>2e</sub> per capita. Therefore, a significant impact will occur and mitigation will be required.

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## 5.6.5 Mitigation Measures/Project Design Features

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The Air Quality Assessment identified mitigation measures based on reductions in GHGs from energy use, mobile emissions, water use, and waste. CalEEMod runs were conducted which included the following:

- Implement NEV Network (electronic vehicle charging stations)
- Exceed Title 24 by 20%
- Install High Efficiency Lighting (20% reduction)
- Apply Water Conservation Strategy (20% indoor and 20% outdoor)
- Institute Recycling and Composting Services (20% reduction)
- Sequestration (planting of at least 430 trees)

In addition, Project daily trip generation rates were adjusted as a result of a shuttle program as outlined in Section 5.13, Transportation and Traffic.

### 1. Standard Mitigation Measures

None required. The City of Napa Policy Resolution 27 does not include mitigation measures in the area of Greenhouse Gas Emissions.

### 2. Special Mitigation Measures

With incorporation of the following mitigation measure, operational GHG emissions would be reduced; however, GHG emissions would still exceed the BAAQMD significance threshold.

<p>MM GHG-1 Prior to the issuance of building permits, the City shall ensure that building plans reflect the following measures are to be implemented in the areas of Transportation, Energy-Efficiency, Water and Waste Consumption Measures to Reduce Project GHG Emissions.</p> <ol style="list-style-type: none"><li>1. Ensure that all winery-related industrial wastewater is treated on-site and instate a program to reduce indoor and outdoor water use by at least 20%;</li><li>2. Instate a program to ensure that 2013 Title 24 energy standards (used by the CalEEMod model) for energy use and lighting are exceeded by at least 20%. Adherence to CalGreen 2016 Title 24 energy standards and other measures would be necessary including, but not limited to:<ol style="list-style-type: none"><li>a. Sensors shall be installed in all rooms that detect if a guest is in the room and activate the HVAC.</li><li>b. A separate system requires the guest room key to be inserted for the lights to work in the hotel rooms.</li><li>c. LED lights installed throughout</li><li>d. All new appliances would be energy efficiency rated for the hotel;</li></ol></li><li>3. Instate a recycling and compost program that would divert at least 20% of waste created on-site.</li></ol>
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### 3. Project Design Features

Thresholds of significance identified in the CEQA Guidelines, Appendix G, state that the Project would have a significant impact if it: The following Project Design Features (PDFs) will further reduce operational greenhouse gas impacts as analyzed in the Air Quality and Greenhouse Gas Assessment:

- Designate at least 53 clean air vehicle (i.e. electric vehicle) parking spaces
- Plant at least 430 new trees on the Project site
- Expand a shuttle program that would reduce project trip generation by at least 180 trips per day

#### 5.6.6 Level of Significance after Mitigation

Thresholds of significance identified in the CEQA Guidelines, Appendix G, state that a project would have a significant impact if it would:

- a) Generate GHG emissions, directly or indirectly, or
- b) Conflict with an applicable plan, policy or regulation adopted to reduce GHG emissions.

#### 1. Short-Term Construction Emissions

As discussed above, short-term construction GHG emissions are anticipated to be 950 MTCO<sub>2e</sub> per year. The BAAQMD standard is 1,100 MTCO<sub>2e</sub> or 4.6 MTCO<sub>2e</sub> per capita, and the proposed Project would be below the threshold. Therefore, no mitigation is required for short-term construction emissions.

#### 2. Long-Term Operational Emissions

Table 5.6-4 below shows the mitigated Project GHG emissions, including the percent reduction per source category. Implementation of Mitigation Measure MM GHG-1 and the PDFs identified above would reduce operational GHG emissions to 10.8 MTCO<sub>2e</sub> per capita based on service population, which would still exceed the BAAQMD threshold of 4.6 MTCO<sub>2e</sub> per capita. The City of Napa does not have a climate action plan; therefore, the quantified approach using thresholds of significance for analysis of GHG impacts was used. As shown below, the impact would remain significant and unavoidable.

**Table 5.6-4 Mitigated Annual Project GHG Emissions**

Source Category	2020 Proposed Project		
	Hotel <sup>1</sup> (metric tons CO <sub>2</sub> equivalents)	Winery and Other (metric tons CO <sub>2</sub> equivalents)	Percent Reduction by Source Category
Area	<1	<1	--
Energy Consumption (Exceed Title 24, Install High-Efficiency Lighting)	334	159	15%
Mobile (Implement NEV Network, Shuttle Program)	1,051	322	6%
Solid Waste Generation (Institute Recycling and Composting Services)	45	24	20%
Water Usage (Apply Water Conservation Strategy)	9	19	22%

Source Category	2020 Proposed Project		
	Hotel <sup>1</sup> (metric tons CO <sub>2</sub> equivalents)	Winery and Other (metric tons CO <sub>2</sub> equivalents)	Percent Reduction by Source Category
New Tree Planting (Sequestration)	-10	--	na
Fermentation (Biogenic)	--	105	--
<b>Total Project Mitigated Emissions</b>	<b>2,058 MTCO<sub>2</sub>e per year</b>		<b>10%</b>
Emissions per capita <sup>2</sup>	<b>10.8</b>		<b>10%</b>
BAAQMD Threshold	<b>1,100 MTCO<sub>2</sub>e per year OR 4.6 MTCO<sub>2</sub>e per capita</b>		
Significant?	<b>Yes</b>		

<sup>1</sup> Assumes 80% occupancy

<sup>2</sup> Based on a service population of 190

na = not applicable

The table below shows mitigated and unmitigated GHG emissions in both metric tons per year and per capita emissions.

**Table 5.6-5 GHG Emissions Summary**

	Metric Tons CO <sub>2</sub> Equivalent Per Year	Per Capita Emissions
Unmitigated GHG Emissions	2,277	12.0
Mitigated GHG Emissions	2,058	10.8
Total Reduction with Mitigation	-219	1.2

As shown in the tables above, long-term operational emissions will result in an exceedance of the BAAQMD threshold of 1,100 MTCO<sub>2</sub>e per year by approximately 1,058 MTCO<sub>2</sub>e per year with mitigation. The exceedance is due, in large measure, to mobile emissions and energy consumption for hotel workers and guests. Therefore, the Project will generate GHG emissions that will have a significant impact on the environment.

The Scoping Plan adopted as a result of AB 32 has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, and voluntary actions, among others, to reduce GHG impacts on a statewide level. The current statewide emissions limit is a baseline of 507 MMTCO<sub>2</sub>e. An additional reduction of 80 million metric tons is necessary to reduce statewide emissions to meet the AB 32 target by 2020. The proposed Project would not conflict or otherwise interfere with the statewide GHG reduction measures identified in CARB’s Scoping Plan.

The Project would comply with requirements of the Green Building Code. Proposed buildings would be constructed in conformance with CALGreen and the Title 24 Building Code, which requires high-efficiency water fixtures and water-efficient irrigation systems. Implementation of Mitigation Measure MM GHG-1 and Project Design Features will result in a reduction of 219 MTCO<sub>2</sub>e but would not reduce operational emissions to a level below adopted thresholds. Therefore, GHG emissions will result in a significant and unavoidable impact.

### **5.6.7 Cumulative Impacts**

The proposed Project will contribute GHG emissions that exceed the BAAQMD threshold. Mitigation based on existing required state and local reduction measures has been included herein. Project emissions, combined with emissions from the adjacent and previously approved developments of Napa Pipe and Meritage Commons, as well as reasonably foreseeable projects in the Project vicinity, will contribute to an exceedance of BAAQMD standards on a cumulative basis. The cumulative operational impact will remain significant and unavoidable.

### **5.6.8 Unavoidable Adverse Impacts**

The Project's operational emissions with mitigation and Project Design Features will remain above thresholds and will, therefore, result in an unavoidable and adverse impact.

