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## APPENDIX E

# ENERGY CONSUMPTION ANALYSIS

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# The Ganahl Lumber Hardware Store and Lumber Yard Project

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## Energy Consumption Analysis

San Juan Capistrano, California

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ECORP Consulting, Inc. has assisted public and private land owners with environmental regulation compliance since 1987. We offer full service capability, from initial baseline environmental studies through environmental planning review, permitting negotiation, liaison to obtain legal agreements, mitigation design, construction monitoring, and compliance reporting.

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**ATTACHMENT**

Attachment A – Project Automotive Fuel Consumption

**LIST OF ACRONYMS AND ABBREVIATIONS**

CEC	California Energy Commission
CEQA	California Environmental Quality Act
CPUC	California Public Utilities Commission
DSA	Division of the State Architect
ECDMS	Energy Consumption Data Management System

**LIST OF ACRONYMS AND ABBREVIATIONS**

EPS	Emissions Performance Standard
kWH	Kilowatt hours
Project	Ganahl Lumber Hardware Store and Lumber Yard Project
RPS	Renewables Portfolio Standard
SB	Senate Bill
SCE	Southern California Edison
SoCalGas	Southern California Gas Company

## 1.0 INTRODUCTION

Energy consumption is analyzed due to the potential direct and indirect environmental impacts associated with the proposed Ganahl Lumber Hardware Store and Lumber Yard Project (Project). Such impacts include the depletion of nonrenewable resources (electricity, natural gas, and equipment and automotive fuel.) and emissions of pollutants during both Project construction and long-term operation.

### 1.1 Project Description and Location

The Proposed Project is located on a 17-acre site along Stonehill Drive between the San Juan Creek Trail and Camino Capistrano in the City of San Juan Capistrano. The site is mostly disturbed with a vehicle storage facility containing 752 spaces in its central and southern portion and a vacant disturbed lot in the northern section of the site. A section of the northern portion of the Project site has been previously graded for use as a construction yard for Orange County Public Works San Juan Creek Levee Phases 4, 5, and 6 Project. (This project is not related to the proposed Project.)

The Project site is bounded by a residential mobile home park to the north, a rail line and commercial land uses to the east with Interstate 5 beyond, and Stonehill Drive to the south with industrial/commercial land uses, including a hotel, beyond. To the west of the Project site is San Juan Creek and Creekside Park, with residential land uses beyond.

The Project site is designated by the City of San Juan Capistrano General Plan as “Industrial Park.” According to the San Juan Capistrano General Plan, the Industrial Park designation allows for light industrial and manufacturing uses, including wholesale businesses, light manufacturing and assembly, research and development, warehousing and storage, and distribution and sales.

The Proposed Project includes several uses and is distinguished by three separate components known as Site A, Site B, and Site C.

#### **Site A**

Site A includes the 2.06 acres closest to Stonehill Drive and is proposed to accommodate the development of two building pads and entitlement for approximately 6,000 square feet of food service space to be constructed and operated independently of Ganahl Lumber. Site A would include 0.5 acre of internal circulation.

#### **Site B**

The proposed Project would be constructed on 10.61 acres in the center of the property (Site B). The proposed Project would include three main buildings and 12 sheds:

- **Building 1: 55,723-square foot Hardware Store (Retail).** All Ganahl Lumber retail sales would be housed in this building, which includes a complete hardware store, a doors and windows showroom and sales department, hardwood and molding display areas, as well as sales and customer service areas. The structure would include a control room for yard operations and a mezzanine.

- **Building 2: 44,370-square foot Drive-Thru Shed and Marking Room with Loading Docks.** This building would accommodate Ganahl Lumber product storage.
- **Building 3: 22,513-square foot Will Call and Storage/Operations Offices.** Building 3 would accommodate distribution operations and includes a customer service area. Delivery and receiving activity would be scheduled and conducted in the office of the building.
- **Building 4: 187-square foot Guard House.** Building 4 would be located between the main retail customer parking area and the yard. The guard house would be staffed during all business hours (6 am to 6 pm) and would have closed and secured gates when the business is closed to customers.
- **T-Sheds 5A – 5F: Six Storage Sheds spanning 2,856 square feet each, totaling 17,136 square feet.** These six sheds would serve as service and building materials stock areas (sheds), primarily to store lumber and wood products, and would be located on the northern and western sections of Site B. These storage sheds would not be permanently staffed. Employees and customers would come and go as stored product is sold or replenished in the regular sales cycle.
- **Buildings 6A, 6B, & 6C: Three Pole Sheds totaling 17,837 square feet.** These proposed pole sheds would be located predominantly on the perimeter of the northern section of Site B. The pole sheds would be used for storage of inventory (products such as lumber, plywood, other panel products, and bagged concrete products) and would not be permanently staffed. The pole sheds would also serve a secondary purpose of providing a sound and visual barrier between the lumber yard and Site C and the residential area to the north, as well as from the San Juan Creek Channel and linear park, and residential area across the channel to the west. The proposed landscaped berm on Site C would further block the sight lines and serve as a noise barrier between the Project site and the residential area to the north. At the eastern border, the shed would block the sound of the railroad while also providing unique possibilities for public art, viewable from the train, from Stonehill Drive, and from the hills above.
- **L-Sheds 7A – 7B: Two Storage Sheds totaling 3,619 square feet.** These sheds would serve as service and building materials stock areas (sheds) and would be located on the northern and western sections of Site B. Specifically, they would be used to store lumber and wood products. These storage sheds would not be permanently staffed. Employees and customers would come and go as stored product is sold or replenished in the regular sales cycle. The L-Sheds would also serve a secondary purpose of providing a sound and visual barrier between the lumber yard and Site C and the residential area to the north, as well as from the San Juan Creek Channel and linear park, and residential area across the channel to the west.

The total building area of Site B is 161,385 square feet spanning a footprint 2.96 acres. Retail business hours would be 6:00 am to 6:00 pm Monday through Saturday (no Sunday hours). In addition, some staff would arrive a half hour to an hour prior to opening to prepare the store for customers. A night shift would be scheduled to work in Building 1 until 11:00 pm and may work longer as needed depending on work load. A third shift from 10:00 pm to 6:00 am may be added in the future as the business is



established and volumes dictate. After-hours activities would include replenishment, cleaning, and order pulling for the next day.

The Project also proposes a lumber yard. The approximate four-acre yard would support six to nine trucks for deliveries to customers. The on-site fleet would consist of trucks, trailers, 10-wheel trucks, bobtail, and box trucks. The fleet would be fueled by an onsite 6,000-gallon above ground diesel refueling tank (double wall with containment vessel) built to current standards with containment features to avoid potential hazardous materials impacts. Customer deliveries per day would typically number from 30 to 40 stops. Ganahl Lumber is anticipated to handle 10 to 15 incoming vendor trucks per day supplying material for replenishment of inventory.

Yard operating hours would be from 5:00 am to 11:00 pm Monday through Friday. All receiving would take place from 6:00 am to 11:00 pm. It is forecasted that within two years of operation a shift from 11:00 pm to 7:00 am would be added for organizing and preparing materials for the next day. All Ganahl Lumber trucks and vendor deliveries would enter at the proposed signalized location located at the southern end of the property. All Ganahl Lumber and vendor trucks would exit at the same signalized intersection onto Stonehill Drive.

Approximately 10 to 12 material handling vehicles would be used in the lumber yard to stack, load, and unload product at the yard. Storage in the yard would consist of covered racking and storage sheds for lumber and building materials as described above. The racking would vary to match the products stored. Pallet racks, cantilever racks, and custom racks for storing doors and windows would be incorporated in the layout of the yard. Customer traffic into the yard area would enter and exit through a controlled and guarded point located in front of Building 1. The yard includes a trash compactor, baler, and generator.

Site B includes a total of 165 parking spaces at grade surrounding Building 1, on the south side of Building 2, and a double row of parking on the north end (including handicap accessible stalls and walkways) available to employees and customers.

### **Site C**

The majority of Site C is proposed to be utilized as an approximately 4.4-acre vehicle storage lot for local car dealers. The lot would consist of a pervious crushed rock base with landscaping and would include 399 vehicle storage spaces with a capacity to store more vehicles if tandem parking or other parking strategies are utilized. The northern portion of Site C is proposed to accommodate a landscaped berm in order to block the sight lines of the parked cars from the backyards of the neighboring residences to the north.

Construction of the proposed Project is anticipated to last 18 months.

## **2.0 ENERGY CONSUMPTION**

To better integrate the energy analysis with the rest of the California Environmental Quality Act (CEQA), the Governor's Office of Planning Research has added relevant questions regarding potential energy impacts currently contained in CEQA Guidelines Appendix F to the sample environmental checklist in Appendix G, holding that CEQA-related environmental analysis must quantify energy use during

construction and operations, including energy associated with transportation associated with the Project, and also consider the availability of measures to reduce reliance on fossil fuels.

## **2.1 Existing Setting**

### ***Electricity/Natural Gas Services***

Southern California Edison (SCE) provides electrical services to San Juan Capistrano through State-regulated public utility contracts. SCE, the largest subsidiary of Edison International, is the primary electricity supply company for much of Southern California. It provides 14 million people with electricity across a service territory of approximately 50,000 square miles. SCE has met or exceeded all Renewable Portfolio Standard requirements to date, procuring renewable energy from diverse sources, including biomass, biowaste, geothermal, hydroelectric, solar, and wind. This Standard requires all California utilities to generate 33 percent of their electricity from renewables by 2020, 50 percent of their electricity from renewables by 2030, and 100 percent by 2045 (SCE 2014).

The Southern California Gas Company (SoCalGas) provides natural gas services to the Project area. As the nation's largest natural gas distribution utility, SoCalGas delivers natural gas energy to 21.6 million consumers through 5.9 million meters in more than 500 communities. SoCalGas's service territory encompasses approximately 20,000 square miles throughout Central and Southern California, from Visalia to the Mexican border (SoCalGas 2019).

### ***Energy Consumption***

Electricity use is measured in kilowatt hours (kWh), and natural gas use is measured in therms. Vehicle fuel use is typically measured in gallons (e.g., of gasoline or diesel fuel), although energy use for electric vehicles is measured in kWh.

The electricity consumption attributable to non-residential land uses (commercial and industrial) in Orange County from 2014 to 2018 is shown in Table 2-1. As indicated, the electricity demand has decreased since 2014.

<b>Year</b>	<b>Non-Residential Electricity Consumption (kWH)</b>
2018	13,044,070,989
2017	13,285,465,398
2016	13,479,185,717
2015	13,799,566,708
2014	13,807,333,656

Source: California Energy Consumption Data Management System (ECDMS) 2019.

The natural gas consumption attributable to non-residential land uses in Orange County from 2014 to 2018 is shown in Table 2-2. As shown, natural gas demand has increased between 2017 and 2018.

<b>Year</b>	<b>Non-Residential Natural Gas Consumption (therms)</b>
2018	236,102,647
2017	232,285,127
2016	232,223,485
2015	227,551,930
2014	225,550,853

Source: ECDMS 2019

Automotive fuel consumption in Orange County from 2013 to 2018 is shown in Table 2-3. On-road fuel consumption has decreased between 2013 and 2018, whereas off-road fuel consumption increased in that same time period. On-road fuel construction corresponds to operational fuel use and off-road fuel consumption corresponds to construction equipment fuel use.

<b>Year</b>	<b>On-Road Automotive Fuel Consumption (gallons)</b>	<b>Off-Road Equipment Fuel Consumption (gallons)</b>
2018	1,384,981,472	17,511,223
2017	1,412,971,800	17,040,533
2016	1,425,043,591	16,580,019
2015	1,427,024,567	15,967,930
2014	1,430,174,246	15,353,160
2013	1,425,883,673	14,857,903

Source: California Air Resources Board (CARB) 2014.

## **2.2 Regulatory Framework**

### **California Energy Efficiency Standards for Residential & Nonresidential Buildings (Title 24)**

Title 24, California’s energy efficiency standards for residential and nonresidential buildings, were established by the California Energy Commission (CEC) in 1978 in response to a legislative mandate to create uniform building codes to reduce California’s energy consumption and provide energy efficiency standards for residential and nonresidential buildings. California’s energy efficiency standards are updated on an approximate three-year cycle. In 2016, the CEC updated Nonresidential Title 24 standards with more stringent requirements. The 2016 standards, which went into effect on January 1, 2017, have substantially reduced the growth in electricity and natural gas use. In December 2018, the CEC released updated standards for 2019 (CEC 2018).

### **California Green Building Standards**

The California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CALGreen Code, is a statewide mandatory construction code that was developed and adopted by the California Building Standards Commission and the California Department of Housing and Community Development. The CALGreen standards require new residential and commercial buildings to comply with mandatory measures under the topics of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. CALGreen also has voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics. The most recent update to the CALGreen Code was adopted in 2019. Part 1, the California Administrative Code was effective as of January 2019, whereas parts 2 through 5 and 11 through 12 will become effective on January 1, 2020. The update primarily aims to provide greater clarity and consistency (Division of the State Architect [DSA] 2019).

### **Senate Bill 1368**

On September 29, 2006, Governor Arnold Schwarzenegger signed into law Senate Bill (SB) 1368 (Perata, Chapter 598, Statutes of 2006). The law limits long-term investments in baseload generation by the State's utilities to those power plants that meet an Emissions Performance Standard (EPS) jointly established by the CEC and the California Public Utilities Commission (CPUC).

The CEC has designed regulations that:

- Establish a standard for baseload generation owned by or under long-term contract to publicly owned utilities, of 1,100 pounds carbon dioxide per megawatt hour. This would encourage the development of power plants that meet California's growing energy needs while minimizing their emissions of greenhouse gas;
- Require posting of notices of public deliberations by publicly owned utilities on long-term investments on the CEC website. This would facilitate public awareness of utility efforts to meet customer needs for energy over the long term while meeting the State's standards for environmental impact; and
- Establish a public process for determining the compliance of proposed investments with the EPS (Perata, Chapter 598, Statutes of 2006).

### **Renewable Energy Sources (Renewables Portfolio Standard)**

Established in 2002 under SB 1078, and accelerated by SB 107 (2006) and SB 2 (2011), California's Renewables Portfolio Standard (RPS) obligates investor-owned utilities, energy service providers, and community choice aggregators to procure 33 percent of their electricity from renewable energy sources by 2020. Eligible renewable resources are defined in the 2013 RPS to include biodiesel; biomass; hydroelectric and small hydro (30 megawatts or less); Los Angeles Aqueduct hydro power plants; digester gas; fuel cells; geothermal, landfill gas; municipal solid waste; ocean thermal, ocean wave, and tidal current technologies; renewable derived biogas; multi-fuel facilities using renewable fuels; solar photovoltaic; solar thermal electric; wind; and other renewables that may be defined later. Governor Jerry Brown signed SB 350 on October 7, 2015, which expands the RPS by establishing a goal of 60 percent of the total electricity sold to retail customers in California per year by December 31, 2030. In addition, SB 350 includes the goal to double the energy efficiency savings in electricity and natural gas final end uses (such as heating, cooling, lighting, or class of energy uses upon which an energy efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal. SB 350 also provides for the transformation of the California Independent System Operator (ISO) into a regional organization to promote the development of regional electricity transmission markets in the western states and to improve the access of consumers served by the California ISO to those markets, pursuant to a specified process.

## 2.3 Energy Consumption Impact Assessment

### ***Thresholds of Significance***

CEQA Guidelines Appendix G state that a project may have a significant effect on the environment if implementation would result in any of the following:

1. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?
2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The impact analysis focuses on the four sources of energy that are relevant to the proposed Project: electricity, natural gas, the equipment fuel necessary for Project construction, and the automotive fuel necessary for Project operations. Addressing energy impacts requires an agency to make a determination as to what constitutes a significant impact. There are no established thresholds of significance, statewide or locally, for what constitutes a wasteful, inefficient, and unnecessary consumption of energy for a proposed manufacturing land use. For the purposes of this analysis, the amount of electricity, natural gas, construction fuel, and fuel use from operations are quantified and compared to that consumed by non-residential land uses (commercial and industrial) in Orange County.

### ***Methodology***

The analysis of electricity/natural gas usage is based on California Emissions Estimator Model (CalEEMod) modeling conducted by ECORP Consulting, Inc. (ECORP 2019), which quantifies energy use for Project operations. The amount of operational automotive fuel use was estimated using CARB's EMFAC2014 computer program, which provides projections for typical daily fuel usage in Orange County. The amount of total construction-related fuel use was estimated using ratios provided in the Climate Registry's General Reporting Protocol for the Voluntary Reporting Program, Version 2.1.

The electricity/natural gas use of the proposed Project is first analyzed as a whole on an annual scale. The electricity/natural gas use is then analyzed for each of the three parcels with unique proposed uses.

### ***Impact Analysis***

#### **Project-Induced Countywide Increase in Energy Consumption**

Energy consumption associated with the construction and operation of the proposed Project is summarized in Table 2-4.

<b>Energy Type</b>	<b>Annual Energy Consumption</b>	<b>Percentage Increase Countywide</b>
Electricity Consumption <sup>1</sup>	1,840,033 kWh	0.014 percent
Natural Gas Consumption <sup>1</sup>	19,536 therms	0.008 percent
Automotive Fuel Consumption		
Project Construction <sup>2</sup>	336,256 gallons	1.900 percent
Project Operations <sup>3</sup>	422,889 gallons	0.031 percent

Source: <sup>1</sup>ECORP 2019; <sup>2</sup>Climate Registry 2016; <sup>3</sup>EMFAC2014 (CARB 2014)

Notes: The Project increases in electricity and natural gas consumption are compared with all of the non-residential buildings in Orange County in 2018, the latest data available. The Project increases in automotive fuel consumption are compared with the countywide fuel consumption in 2018, the most recent full year of data.

As shown in Table 2-4, the increase in electricity usage as a result of the Project would constitute an approximate 0.014 percent increase in the typical annual electricity consumption attributable to non-residential uses in Orange County. Project increases in natural gas usage across Orange County would also be negligible at 0.008 percent. The Project would adhere to all federal, State, and local requirements for energy efficiency, including the Title 24 standards. The Project would be required to comply with Title 24 building energy efficiency standards, which establish minimum efficiency standards related to various building features, including appliances, water and space heating and cooling equipment, building insulation and roofing, and lighting. Implementation of the Title 24 standards significantly reduces energy usage.

As further indicated in Table 2-4, the Project’s gasoline fuel consumption during the one-time construction period is estimated to be 336,256 gallons of fuel, which would increase the annual construction-related gasoline fuel use in the county by 1.9 percent. As such, Project construction would have a nominal effect on local and regional energy supplies. No unusual Project characteristics would necessitate the use of construction equipment that would be less energy efficient than at comparable construction sites in the region or the state. Construction contractors would purchase their own gasoline and diesel fuel from local suppliers and would judiciously use fuel supplies to minimize costs due to waste and subsequently maximize profits. Additionally, construction equipment fleet turnover and increasingly stringent State and federal regulations on engine efficiency combined with State regulations limiting engine idling times and requiring recycling of construction debris, would further reduce the amount of transportation fuel demand during Project construction. For these reasons, it is expected that construction fuel consumption associated with the Project would not be any more inefficient, wasteful, or unnecessary than other similar development projects of this nature.

As indicated in Table 2-4, Project operation is estimated to consume approximately 422,889 gallons of automotive fuel per year, which would increase the annual countywide automotive fuel consumption by 0.031 percent. The amount of operational fuel use was estimated using CARB’s EMFAC2014 computer program, which provides projections for typical daily fuel usage in Orange County. This analysis conservatively assumes that all of the automobile trips projected to arrive at the Project during operations would be new to Orange County. Further, a liberal approach was taken for vehicle trip estimation to

ensure potential impacts due to operational gasoline usage were adequately accounted for. The Project would not result in excessive long-term operational automotive fuel consumption. Fuel consumption associated with vehicle trips generated by the Project would not be considered inefficient, wasteful, or unnecessary in comparison to other similar developments in the region. Furthermore, the Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency.

For informational purposes, the operational energy use for each of the three Project site components is summarized in Table 2-5.

<b>Table 2-5. Operational-Related Energy Use Attributable to Individual Project Components</b>		
<b>Energy Type</b>	<b>Annual Energy Consumption</b>	<b>Percentage Increase Countywide</b>
<b>Proposed Site A (3,500 sf &amp; 1,500 sf Fast-food Restaurants on 2.06 acres)</b>		
Electricity Consumption	224,825 kWh	0.0017 percent
Natural Gas Consumption	15,562 therms	0.0066 percent
<b>Proposed Site B - Ganahl Hardware Store &amp; Lumber Yard (159,643 sf of Ganahl Lumber Buildings, Internal Circulation and Parking spanning 10.6 acres)</b>		
Electricity Consumption	1,565,254 kWh	0.012 percent
Natural Gas Consumption	3,973 therms	0.0017 percent
<b>Proposed Site C (399 Vehicle Storage Spaces on 4.39 acres)</b>		
Electricity Consumption	55,860 kWh	0.00043 percent
Natural Gas Consumption	0 therms	0 percent

Source: ECORP 2019

Notes: The Project increases in electricity and natural gas consumption are compared with all of the non-residential buildings in Orange County in 2018, the latest data available. The Project increases in automotive fuel consumption are compared with the countywide fuel consumption in 2018, the most recent full year of data.

As shown in Table 2-5, the proposed use for Site A is fast-food restaurants, the proposed uses for Site B are a hardware store and lumber yard, and the proposed use for Site C is vehicle storage space.

Electricity and natural gas consumption were analyzed for each of the individual Project site components. As shown in Table 2-5, the percent increase countywide in both electricity and natural gas use would be nominal for each site (between 0 percent and 0.05 percent).

### **3.0 ALTERNATIVES ANALYSIS**

The following discussion is the evaluation of a range of alternative land use patterns for the Project site. The purpose of the alternatives analysis is to inform decision-makers and the public of potential impacts associated with different land use patterns on the subject site and to make decisions about the proposed Project based on the comparisons.



### **3.1 Description of Alternatives**

#### **3.1.1 Alternative 1: No Restaurants**

Alternative 1, No Restaurants, would be identical to the proposed Project although it would preclude the development of buildings on Site A. Specifically, the 2.06 acres of Site A would be converted to approximately 150 parking spaces although would not be developed with 6,000 square feet of food service building space.

#### **Energy Consumption**

##### **Construction**

The grading and site preparation involved with Alternative 1 would require the same amount of ground disturbance as the proposed Project. Thus, similar to the proposed Project, Alternative 1 would require the import of 18,000 cubic yards of fill material and export of 60,000 cubic yards of cut material, which would require gasoline-powered haul trucks. However, Alternative 1 would result in the construction of less building space. For these reasons and can be assumed that construction-related fuel consumption under this Alternative would be slightly less than that predicted for the proposed Project.

##### **Operation**

Alternative 1 would generate 2,395 daily trips whereas the Proposed Project would generate 3,808 trips daily (LSA 2019). This is a reduction in daily trips of 37 percent, and the reduction in operational fuel consumption would be proportionate. Thus, Alternative 1 could be expected to result in the use of 160,697 less gallons of fuel per year during operations. See Table 3-1.

CalEEMod modeling was performed for Alternative 1 to determine the total reduction in electricity and natural gas consumption during Project operations. The results are summarized in Table 3-1 below. As shown, natural gas consumption would be reduced 80 percent compared with the proposed Project and electricity consumption would be reduced 12 percent.

##### **Overall Impact**

Under the proposed Project, the energy consumption would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency or be considered wasteful or inefficient. The elimination of the restaurants from the Project under Alternative 1 would reduce the Project's energy consumption the most of the three alternatives. Comparatively, under the proposed Project, Site A (the restaurants) is the largest contributor to natural gas consumption and the second largest contributor to electricity consumption. Alternative 1 would effectively reduce total energy consumption compared with the Project.

Table 3-1. Ganahl Lumber Project Energy Consumption Comparison – ALTERNATIVE 1					Reduction from Proposed Project
Energy Type	Proposed Project		Alternative 1		
	Annual Energy Consumption	Percentage Increase Countywide	Annual Energy Consumption	Percentage Increase Countywide	
Electricity Consumption <sup>1</sup>	1,840,033 kWh	0.014 percent	1,621,144 kWh	0.012 percent	12 percent
Natural Gas Consumption <sup>1</sup>	19,536 therms	0.008 percent	3,973 therms	0.001 percent	80 percent
Automotive Fuel Consumption					
Project Construction <sup>2</sup>	336,256 gallons	1.900 percent	±336,256 gallons	1.900 percent	0 percent
Project Operations <sup>3</sup>	422,889 gallons	0.031 percent	262,191 gallons	0.019 percent	37 percent

Source: <sup>1</sup>ECORP 2019; <sup>2</sup>Climate Registry 2016; <sup>3</sup>EMFAC2014 (CARB 2014).

### 3.1.2 Alternative 2: Reduced Density – 2,000 Square Feet of Restaurant Building Space

Alternative 2, Reduced Density – 2,000 Square Feet of Restaurant Building Space, would be identical to the proposed Project aside from allowing for 2,000 square feet of fast food restaurant building space as opposed to 6,000 square feet. Alternative 2 would result in 4,000 less square feet of building space compared with the proposed Project. However, the 2.06 acres would still be subject to grading and site preparation.

#### Energy Consumption

##### Construction

Under Alternative 2, the total restaurant size would be reduced by 66 percent. However, the entire 2.06 acres would still require grading and site preparation. Subsequently, the construction equipment required, and total time required to complete construction would remain very similar to the proposed Project as 17.07 acres would still need to be graded and prepared. Gasoline consumption related to construction would remain largely unchanged, as shown in Table 3-2.

##### Operation

Alternative 2 would generate 2,866 daily trips whereas the proposed Project would generate 3,808 trips daily (LSA 2019). This is a reduction in daily trips of 25 percent, and the reduction in operational fuel consumption would be proportionate. Thus, Alternative 2 would result in the use of 105,722 less gallons of fuel per year during operations. See Table 3-2.

CalEEMod modeling was performed for Alternative 2 to determine the total reduction in electricity and natural gas consumption during Project operations. The results are summarized in Table 3-2. As shown,

natural gas consumption would be reduced 53 percent compared with the proposed Project and electricity consumption would be reduced 8 percent.

**Overall Impact**

Under the proposed Project, the energy consumption would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency or be considered wasteful or inefficient. The elimination of 4,000 square feet of restaurant space from the Project under Alternative 2 would reduce the Project’s energy consumption, but to a lesser extent than Alternative 1. Alternative 2 effectively reduces the overall energy consumption of the Project.

Table 3-2. Ganahl Lumber Project Energy Consumption Comparison – ALTERNATIVE 2					Reduction from Proposed Project
Energy Type	Proposed Project		Alternative 2		
	Annual Energy Consumption	Percentage Increase Countywide	Annual Energy Consumption	Percentage Increase Countywide	
Electricity Consumption <sup>1</sup>	1,840,033 kWh	0.014 percent	1,694,104 kWh	0.013 percent	8 percent
Natural Gas Consumption <sup>1</sup>	19,536 therms	0.008 percent	9,161 therms	0.003 percent	53 percent
Automotive Fuel Consumption					
Project Construction <sup>2</sup>	336,256 gallons	1.900 percent	336,256 gallons	1.900 percent	0 percent
Project Operations <sup>3</sup>	422,889 gallons	0.031 percent	317,166 gallons	0.023 percent	25 percent

Source: <sup>1</sup>ECORP 2019; <sup>2</sup>Climate Registry 2016; <sup>3</sup>EMFAC2014 (CARB 2014).

**3.1.3 Alternative 3: Reduced Density – 4,000 Square Feet of Restaurant Building Space**

Alternative 3, Reduced Density – 4,000 Square Feet of Restaurant Building Space, would be identical to the proposed Project although it would allow for 4,000 square feet of fast food restaurant building space as opposed to 6,000 square feet. Alternative 3 would result in 2,000 less square feet of building space compared with the proposed Project. However, the 2.06 acres would still be subject to grading and site preparation.

**Energy Consumption**

**Construction**

Under Alternative 3, the total restaurant size would be reduced by 33 percent. However, the entire 2.06 acres would still require grading and site preparation for the remaining 2,000 square feet of restaurant space. Subsequently, the construction equipment required and total time required to complete

construction would remain very similar to the proposed Project as 17.07 acres would still need to be graded. Gasoline consumption related to construction would remain largely unchanged, as shown in Table 3-3.

**Operation**

The elimination of 33 percent of the restaurant space under Alternative 3 would reduce the number of customers traveling to and from the Project site. It is anticipated that the reduction in operational fuel consumption would be proportionate the 12 percent reduction in vehicle trips expected for this Alternative. Alternative 3 would generate 3,337 daily trips whereas the proposed Project would generate 3,808 trips daily (LSA 2019). Thus, Alternative 3 would result in the use of 54,975 less gallons of fuel per year during operations. See Table 3-3.

CalEEMod modeling was performed for Alternative 3 to determine the total reduction in electricity and natural gas consumption during Project operations. The results are summarized in Table 3-3. As shown, natural gas consumption would be reduced 26 percent compared with the proposed Project and electricity consumption would be reduced 4 percent.

**Overall Impact**

Under the proposed Project, the energy consumption would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency or be considered wasteful or inefficient. The elimination of 2,000 square feet of restaurant space from the Project under Alternative 3 would reduce the Project’s energy consumption, but to a lesser extent than both Alternatives 1 and 2. Alternative 3 reduces the overall energy consumption of the Project yet does so the least effectively of the three alternatives.

Table 3-3. Ganahl Lumber Project Energy Consumption Comparison – ALTERNATIVE 3					Reduction from Proposed Project
Energy Type	Proposed Project		Alternative 3		
	Annual Energy Consumption	Percentage Increase Countywide	Annual Energy Consumption	Percentage Increase Countywide	
Electricity Consumption <sup>1</sup>	1,840,033 kWh	0.014 percent	1,767,064 kWh	0.014 percent	4 percent
Natural Gas Consumption <sup>1</sup>	19,536 therms	0.008 percent	14,338 therms	0.008 percent	26 percent
Automotive Fuel Consumption					
Project Construction <sup>2</sup>	336,256 gallons	1.900 percent	336,256 gallons	1.900 percent	0 percent
Project Operations <sup>3</sup>	422,889 gallons	0.031 percent	367,913 gallons	0.027 percent	12 percent

Source: <sup>1</sup>ECORP 2019; <sup>2</sup>Climate Registry 2016; <sup>3</sup>EMFAC2014 (CARB 2014).

## 4.0 REFERENCES

- California ECDMS. 2019. Website: Electricity and Natural Gas Consumption by County. <http://www.ecdms.energy.ca.gov/>.
- CARB. 2014. EMFAC2014 Emissions Model.
- CEC. 2018. Building Efficiency Standards for Residential and Nonresidential Buildings. <https://ww2.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf>.
- DSA. Summary of 2019 California Building Standard Code Changes. <https://www.dgs.ca.gov/BSC>.
- ECORP. 2019. *Ganahl Lumber Hardware Store and Lumber Project Air Quality and Greenhouse Gas Assessment*.
- LSA. 2019. *Ganahl Lumber Hardware Store and Lumber Project Traffic Assessment*.
- SCE. 2014. Corporate Responsibility Report. [https://www1.sce.com/wps/wcm/connect/fb423d8a-82df-458f-80ad-916166da17d7/2014\\_Corporate\\_Responsibility\\_Report\\_WCAG.pdf?MOD=AJPERES](https://www1.sce.com/wps/wcm/connect/fb423d8a-82df-458f-80ad-916166da17d7/2014_Corporate_Responsibility_Report_WCAG.pdf?MOD=AJPERES).
- SoCalGas. 2019. Natural Gas Service Guidebook. [https://www.socalgas.com/1443742450763/SoCalGas-Natural-Gas-Service-Guidebook-2019-05\\_remediated--1-.pdf](https://www.socalgas.com/1443742450763/SoCalGas-Natural-Gas-Service-Guidebook-2019-05_remediated--1-.pdf).

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**ATTACHMENT A**

Project Automotive Fuel Consumption

**Proposed Project  
Total Construction-Related Operational  
Gasoline Usage**

<b>Action</b>	<b>Carbon Dioxide Equivalents (CO<sub>2</sub>e) in Metric Tons<sup>1</sup></b>	<b>Conversion of Metric Tons to Kilograms<sup>2</sup></b>	<b>Construction Equipment Emission Factor<sup>2</sup></b>	<b>Total Gallons of Fuel Consumed</b>
<b>Project Construction</b>	<b>3413</b>	<b>3413000</b>	<b>10.15</b>	<b>336,256</b>
		Per Climate Registry Equation 13e	Per Climate Registry Equation 13e	
	Per CalEEMod Output Files.			

**Total Gallons Consumed During Project Construction: 336,256**

**Notes:**

Fuel used by all construction equipment, including vehicle hauling trucks, assumed to be diesel.

**Sources:**

ECORP Consulting. 2019. Ganahl Lumber Hardware Store and Lumber Yard Air Quality & Greenhouse Gas Emissions Assessment

Climate Registry. 2016. *General Reporting Protocol for the Voluntary Reporting Program version 2.1*. January 2016.  
<http://www.theclimateregistry.org/wp-content/uploads/2014/11/General-Reporting-Protocol-Version-2.1.pdf>

**Total Gallons During Project Operations**

Area	Sub-Area	Cal. Year	Season	Veh_tech	EMFAC AC2007 Category	Fuel_GAS	Fuel_DSL	Daily Total	<b>ANNUAL TOTAL</b>
Sub-Areas	Orange County	2021	Annual	All Vehicles	All Vehicles	1.15	0.0086	1.1586	<b>422.889</b>

**Sources:**

Californai Air Resource Board. 2014. EMFAC2014 Mobile Emissions Model.

**422889**