

Appendix D

Energy Consumption Assessment

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**Energy Consumption Assessment
for the
El Centro Town Center Phase II – Single Family
Residential and Industrial Project**

City of El Centro, California

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CONTENTS

1.0 INTRODUCTION 1

 1.1 Project Location and Description..... 1

2.0 ENERGY CONSUMPTION..... 3

 2.1 Energy Types and Sources..... 3

 2.1.1 Energy Consumption 3

 2.2 Regulatory Framework..... 4

 2.2.1 State..... 4

 2.2.2 Renewable Energy Sources (Renewable Portfolio Standards)..... 5

 2.3 Energy Consumption Impact Assessment..... 6

 2.3.1 Thresholds of Significance 6

 2.3.2 Methodology 6

 2.3.3 Impact Analysis..... 7

3.0 REFERENCES..... 10

LIST OF TABLES

Table 2-1. Electricity Consumption in Imperial County 2017 - 2021 3

Table 2-2. Natural Gas Consumption in Imperial County 2017-2021 4

Table 2-3. Automotive Fuel Consumption in Imperial County 2018-2022..... 4

Table 2-4. Proposed Project Energy and Fuel Consumption 7

ATTACHMENTS

Attachment A - Energy Consumption Modeling Output

LIST OF ACRONYMS AND ABBREVIATIONS

CalEEMod	California Emissions Estimator Model
CAISO	California Independent System Operator
CARB	California Air Resources Board
CEC	California Energy Commission
City	City of El Centro
County	Imperial County
CPUC	California Public Utilities Commission
EO	Executive Order

EPS	Emissions Performance Standard
IEPR	Integrated Energy Policy Report
IID	Imperial Irrigation District
kWh	Kilowatt-Hours
MW	Megawatt
MWh	Megawatt Hour
Project	El Centro Town Center Phase II - Single Family Residential and Industrial Project
RPS	Renewable Portfolio Standard
SB	Senate Bill

1.0 INTRODUCTION

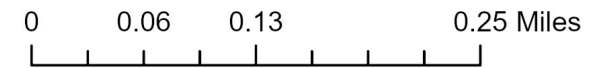
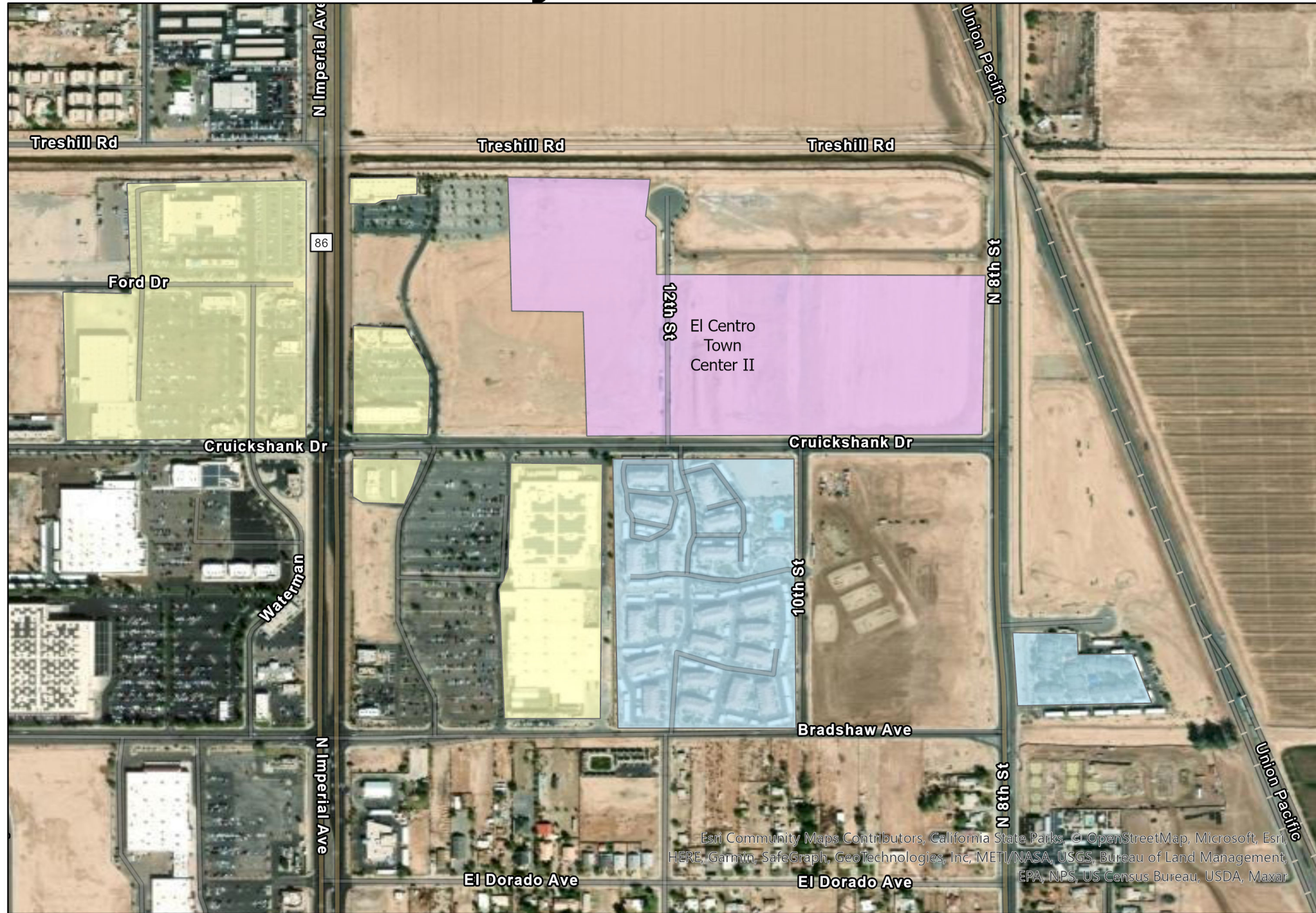
This report documents the results of an Energy Impact Assessment completed for the El Centro Town Center Phase II - Single Family Residential and Industrial Project (Project), which includes the construction of mixed-use development with warehouse space and residential uses. This report was prepared to analyze the potential direct and indirect environmental impacts associated with Project energy consumption, including the depletion of nonrenewable resources (oil, natural gas, coal, etc.) during the construction and operational phases. 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.

1.1 Project Location and Description

The 35.78-acre Project Site is located in the City of El Centro (City), located in Imperial County. The Project Site is currently undeveloped and located at the Cruickshank Drive and North 8th Street intersection. The land uses surrounding the site consist mainly of commercial and agricultural (see Figure 1-1. Project Location).

The Project proposes the construction of a mixed-use development with warehouse buildings spanning 17.26-acres and a maximum of 104 residential units on the adjacent 18.52-acres, along with a park and various Project amenities. The Project is proposed to be constructed in two phases. Phase 1 proposes the construction of the residential units and Phase 2 proposes the construction of the warehouse space. Construction of Phase 1 would begin in January of 2024 and Phase 2 would begin in January of 2025 with both phases lasting approximately 20 months. Project construction would require the export of 9,000 cubic yards of soil and the import of 116,000 cubic yards of soil with a majority of the soil movement occurring in Phase 1.

Project Location



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Map Date: 2/3/2022
Photo (or Base) Source: ArcGIS

Figure 1-1. Project Location

2.0 ENERGY CONSUMPTION

2.1 Energy Types and Sources

California relies on a regional power system comprised of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. Natural gas provides California with a majority of its electricity followed by renewables, large hydroelectric and nuclear. Imperial Irrigation District (IID), the sixth largest electrical utility in California serving more than 150,000 customers in the Imperial Valley and parts of Riverside and San Diego counties, including the Project Area. IID controls more than 1,100 megawatts of energy derived from a diverse resource portfolio that includes its own generation, and long- and short-term power purchases. Located in a region with abundant sunshine, enviable geothermal capacity, wind and other renewable potential, IID has met or exceeded all Renewable Portfolio Standard (RPS) requirements to date, procuring renewable energy from diverse sources, including biomass, biowaste, geothermal, hydroelectric, solar and wind.

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

2.1.1 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 associated with all uses in Imperial County from 2017 to 2021 is shown in Table 2-1. As indicated, the demand has increased since 2017.

Year	Electricity Consumption (kilowatt hours)
2021	1,480,949,612
2020	1,486,230,116
2019	1,416,666,988
2018	1,467,718,883
2017	1,445,280,122

Source: CEC 2022

The natural gas consumption associated with all uses in Imperial County from 2017 to 2021 is shown in Table 2-2. As indicated, the demand has increased since 2017.

Year	Natural Gas Consumption (therms)
2021	41,022,103
2020	41,948,138
2019	42,914,061
2018	38,729,630
2017	40,438,472

Source: CEC 2022

Automotive fuel consumption in Imperial County from 2016 to 2021 is shown in Table 2-3. Fuel consumption has remained relatively constant between 2018 and 2022.

Year	Total Fuel Consumption
2022	218,702,737
2021	217,385,434
2020	195,840,562
2019	219,032,998
2018	219,075,991

Source: California Air Resources Board (CARB) 2022

2.2 Regulatory Framework

2.2.1 State

2.2.1.1 Integrated Energy Policy Report

Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the CEC to prepare a biennial integrated energy policy report that assesses major energy trends and issues facing California’s electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the State’s economy; and protect public health and safety (Public Resources Code Section 25301a). The CEC prepares these assessments and associated policy recommendations every two years, with updates on alternate years, as part of the Integrated Energy Policy Report (IEPR).

The 2017 IEPR focuses on next steps for transforming transportation energy use in California. The 2017 IEPR addresses the role of transportation in meeting state climate, air quality, and energy goals; the transportation fuel supply; the Alternative and Renewable Fuel and Vehicle Technology Program; current and potential funding mechanisms to advance transportation policy; transportation energy demand forecasts; the status of statewide plug-in electric vehicle infrastructure; challenges and opportunities for electric vehicle infrastructure.

2.2.1.2 Executive Order B-55-18

In September 2018 Governor Jerry Brown Signed Executive Order (EO) B-55-18, which establishing a new statewide goal “to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter.” Carbon neutrality refers to achieving a net zero carbon dioxide emissions. This can be achieved by reducing or eliminating carbon emissions, balancing carbon emissions with carbon removal, or a combination of the two. This goal is in addition to existing statewide targets for GHG emission reduction. EO B-55-18 requires the California Air Resource Board (CARB) to “work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.

2.2.1.3 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 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 (MWh). 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.
- Establish a public process for determining the compliance of proposed investments with the emissions performance standard (EPS) (Perata, Chapter 598, Statutes of 2006).

2.2.1.4 Renewable Energy Sources (Renewable Portfolio Standards)

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, 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 (CAISO) 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 CAISO to those markets, pursuant to a specified process. In 2018, SB 100 was signed by Governor Brown, codifying a goal of 60 percent renewable procurement by 2030 and 100 percent by 2045 Renewables Portfolio Standard.

2.3 Energy Consumption Impact Assessment

2.3.1 Thresholds of Significance

The impact analysis provided below is based on the following CEQA Guidelines Appendix G thresholds of significance. The Project would result in a significant impact to energy if it would do 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 land use. For the purposes of this analysis, the amount of electricity and natural gas estimated to be consumed by the Project are quantified and compared to that consumed by all land uses in Imperial County. Similarly, the amount of fuel necessary for Project construction and operations is calculated and compared to that consumed in Imperial County.

2.3.2 Methodology

Levels of construction and operational related energy consumption estimated to be consumed by the Project include the number of kWh of electricity, therms of natural gas and gallons of gasoline. The amount of total construction-related fuel used was estimated using ratios provided in the Climate Registry's General Reporting Protocol for the Voluntary Reporting Program, Version 2.1. Electricity and natural gas consumption estimates were calculated using the California Emissions Estimator Model (CalEEMod), version 2022.1 (see Air Quality and Greenhouse Gas Emissions Assessment: El Centro Town Center Phase II - Single Family Residential and Industrial Project [ECORP 2023]). CalEEMod is a statewide land use computer model designed to quantify resources associated with both construction and operations from a variety of land use projects. Operational automotive fuel consumption has been calculated with EMFAC 2021. EMFAC 2021 is

a mathematical model that was developed to calculate emission rates and rates of gasoline consumption from motor vehicles that operate on highways, freeways, and local roads in California.

2.3.3 Impact Analysis

2.3.3.1 Project Energy Consumption

The Project includes the construction of warehouse space on 17.26 acres and 104 residential units on 18.52 acres. For the purposes of this analysis, the amount of electricity and natural gas estimated to be consumed by the Project are quantified and compared to that consumed by all land uses in Imperial County in 2021, the most year of data. Similarly, the amount of fuel necessary for Project construction and operations is calculated and compared to that consumed in Imperial County in 2022, the most recent full year of data. This analysis conservatively assumes that all of the automobile trips projected to arrive at the Project during operations would be new to Imperial County.

Energy consumption associated with the Proposed Project is summarized in Table 2-4.

Table 2-4. Proposed Project Energy and Fuel Consumption		
Energy Type	Annual Energy Consumption	Percentage Increase Countywide
<i>Building Space Consumption</i>		
Electricity Consumption ¹	9,378,358 kilowatt-hours	0.63 percent
Natural Gas ¹	180,114 therms	0.43 percent
<i>Automotive Fuel Consumption</i>		
Project Construction Calendar Year One ²	114,286 gallons	0.05 percent
Project Construction Calendar Year Two ²	171,626 gallons	0.08 percent
Project Construction Calendar Year Three ²	65,320 gallons	0.03 percent
Project Operations ³	206,865 gallons	0.09 percent

Source: ¹CalEEMod; ²Climate Registry 2016; ³EMFAC2021 (CARB 2022)

Notes: The Project increases in electricity and natural gas consumption are compared with all uses in Imperial County in 2021, the latest data available. The Project increases in automotive fuel consumption are compared with the countywide fuel consumption in 2021, the most recent full year of data.

Operations of the Proposed Project would include electricity and natural gas usage from lighting, space and water heating, and landscape maintenance activities. As shown in Table 2-4, the annual electricity consumption due to operations would be 9,378,358 kilowatt-hours, resulting in an approximate 0.63 percent increase in the typical annual electricity consumption attributable to all uses in Imperial County. However, this is potentially a conservative estimate. In September 2018 Governor Jerry Brown Signed EO B-55-18, which established a new statewide goal “to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter.” Carbon neutrality refers to achieving a net zero CO₂ emissions. This can be achieved by reducing or eliminating carbon emissions, balancing carbon emissions with carbon removal, or a combination of the two. This goal is in addition to existing statewide targets for GHG emission reduction. Governor’s Executive Order B-55-18 requires CARB

to “work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.” Furthermore, the Project’s increase in natural gas usage of 0.43 percent across all uses in the County would also be negligible. For these reasons, the Project would not result in the inefficient, wasteful, or unnecessary consumption of building energy.

Fuel necessary for Project construction would be required for the operation and maintenance of construction equipment and the transportation of materials to the Project Site. The fuel expenditure necessary to construct the physical building and infrastructure would be temporary, lasting only as long as project construction. As further indicated in Table 2-4, the project’s gasoline fuel consumption during the one-time construction period is estimated to be 114,286 gallons of fuel during the first calendar year of construction, 171,626 gallons of fuel during the second calendar year of construction, and 65,320 gallons of fuel during the third calendar year of construction. This would increase the annual countywide gasoline fuel use in the county by 0.05 percent, 0.08 percent and 0.03 percent, respectively. 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.

Per information provided by Michael Baker International (2022), the Project’s residential component is estimated to generate approximately 1,028 daily trips and the industrial component of the Project is estimated to generate 700 daily trips. As indicated in Table 2-4, the Project is estimated to consume approximately 206,865 gallons of automotive fuel per year, which would increase the annual countywide automotive fuel consumption by 0.09 percent. The amount of operational fuel use was estimated using CARB’s EMFAC2021 computer program, which provides projections for typical daily fuel usage in Imperial County. This analysis conservatively assumes that all of the automobile trips projected to arrive at the Project during operations would be new to Imperial County. Further, a liberal approach was taken for vehicle trip estimation to ensure potential impacts due to operational gasoline usage were adequately accounted. 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.

2.3.3.2 State and Local Plans for Renewable Energy/Energy Efficiency

The Project would be designed in a manner that is consistent with relevant energy conservation plans designed to encourage development that results in the efficient use of energy resources. The Project will be built to the Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations (CCR) (Title 24). Title 24 was established in 1978 in response to a legislative mandate to reduce California’s energy consumption. Title 24 is updated approximately every

three years; the 2019 Title 24 updates went into effect on January 1, 2020. The 2022 standards went into effect became effective January 1, 2023. The 2022 Energy Standards improve upon the 2019 Energy Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2022 update to the Energy Standards focuses on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings, encouraging better energy efficiency, strengthening ventilation standards, and more. The 2022 Energy Standards are a major step toward meeting Zero Net Energy. Buildings permitted on or after January 1, 2023, must comply with the 2022 Standards. Compliance with Title 24 is mandatory at the time new building permits are issued by city and county governments. Additionally, in January 2010, the State of California adopted the California Green Building Standards Code (CalGreen) that establishes mandatory green building standards for all buildings in California. The code was subsequently updated in 2013. The code covers five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. With these building standards in place, the Project would not obstruct any state or local plan for renewable energy or energy efficiency.

3.0 REFERENCES

California Air Resources Board (CARB). 2022. EMFAC2021 Web Database Emissions Inventory.
<https://www.arb.ca.gov/emfac/2021/>.

California Energy Commission (CEC). 2022. 2021 Total System Electric Generations in Gigawatt Hours.
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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>

ECORP Consulting. 2023. El Centro Town Center Phase II – Single Family Residential and Industrial Project Quality and Greenhouse Gas Emissions Assessment.

LIST OF ATTACHMENTS

Attachment A - Energy Consumption Modeling Output

ATTACHMENT A

Energy Consumption Modeling Output

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

Table 1. Construction Year One			
Action	Carbon Dioxide Equivalents (CO₂e) in Metric Tons¹	Conversion of Metric Tons to Kilograms²	Construction Equipment Emission Factor²
Project Construction	1160	1,160,000	10.15
Total Gallons Consumed During Construction Year One:			114,286

Table 2. Construction Year Two			
Action	Carbon Dioxide Equivalents (CO₂e) in Metric Tons¹	Conversion of Metric Tons to Kilograms²	Construction Equipment Emission Factor²
Project Construction	1742	1,742,000	10.15
Total Gallons Consumed During Construction Year Two:			171,626

Table 3. Construction Year Three			
Action	Carbon Dioxide Equivalents (CO₂e) in Metric Tons¹	Conversion of Metric Tons to Kilograms²	Construction Equipment Emission Factor²
Project Construction	663	663,000	10.15
Total Gallons Consumed During Construction Year Three:			65,320

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

Table 4. Construction Year Four			
Action	Carbon Dioxide Equivalents (CO₂e) in Metric Tons¹	Conversion of Metric Tons to Kilograms²	Construction Equipment Emission Factor²
Project Construction	536	536,000	10.15
Total Gallons Consumed During Construction Year Four:			52,808

Sources:
¹ ECORP Consulting. 2022. Air Quality and Greenhouse Gas Emissions Assessment: El Centro Town Center Phase II Residential & Industrial Project
² 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

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

Operations - Industrial

Table 5. Average Miles per Gallon in Imperial County in 2026³								
Area	Sub-Area	Cal. Year	Season	Veh_tech	EMFAC 2021 Category	Total Onroad Vehicle Gallons Consumed in Imperial County in 2026	Total Onroad Vehicle Miles Traveled in Imperial County in 2026	Total Passenger Vehicle Miles per Gallon in Imperial County in 2026
Sub-Areas	Imperial County	2026	Annual	All Vehicles	All Vehicles	213,487,444	4,309,276,576	20.19
Sources: ³ California Air Resource Board. 2021. EMFAC2021 Mobile Emissions Model.								

Table 6. Total Gallons During Project Operations				
Project Onroad Vehicle Daily Trips ³	Estimated Miles per Trip ⁴	Project Onroad Vehicle Daily Miles Traveled	Project Onroad Vehicle Daily Fuel Consumption	Project Onroad Vehicle Annual Fuel Consumption
700	6.3	4,427.00	219.32	80,052
Sources: ³ MBI, 2023, ⁴ CalEEMod 2022.1				

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

Operations - Residential

Table 7. Average Miles per Gallon in Imperial County in 2026 ³								
Area	Sub-Area	Cal. Year	Season	Veh_tech	EMFAC 2021 Category	Total Onroad Vehicle Gallons Consumed in Imperial County in 2026	Total Onroad Vehicle Miles Traveled in Imperial County in 2026	Total Passenger Vehicle Miles per Gallon in Imperial County in 2026
Sub-Areas	Imperial County	2026	Annual	All Vehicles	All Vehicles	213,487,444	4,309,276,576	20.19
Sources: ³ California Air Resource Board. 2021. EMFAC2021 Mobile Emissions Model.								

Table 8. Total Gallons During Project Operations				
Project Onroad Vehicle Daily Trips ³	Estimated Miles per Trip ⁴	Project Onroad Vehicle Daily Miles Traveled	Project Onroad Vehicle Daily Fuel Consumption	Project Onroad Vehicle Annual Fuel Consumption
1,028	6.8	7,013.00	347.43	126,813
Sources: ³ MBI, 2023, ⁴ CalEEMod 2022.1				