3.1.8 Energy Use and Conservation

The Public Resource Code (PRC) Section 21100(b)(3) and CEQA Guidelines Section 15126.4 require EIRs to analyze energy use and conservation and, if necessary, associated mitigation as it is applicable to the project, and in particular to describe any wasteful, inefficient, and unnecessary consumption of nonrenewable energy caused by a project. Thus, this subchapter focuses not on total energy consumed but more on the efficiency with which the electricity, natural gas and fuel (diesel and gasoline) are consumed. The analysis of energy conservation consists of a summary of the energy regulatory framework, the existing conditions at the project site, a discussion of the project's potential impacts on energy resources, and identification of project design features and/or mitigation measures that may reduce energy consumption. The potential for impacts to energy conservation have been evaluated in accordance with Appendix F of the CEQA Guidelines and federal, state, and regional regulations.

3.1.8.1 Existing Conditions

In 2012, total electricity consumed in the State was 302,000 gigawatt-hours (GWh), about 3 percent higher than 2011. While in-state electricity production declined by almost one percent in 2012, net imports from the Northwest and Southwest, made up this difference. Energy imports from the Northwest in 2012 increased by 12 percent, due primarily to an increase in wind generation along with increased biomass and small hydroelectric imports. The installed capacity of the 1,008 in-state power plants with generation rating greater than 0.1 megwatts (MW) totals 69,709 MW. These plants produced 205,695 gigawatt-hours of electricity in 2009 (CEC 2014a). In 2009, 11.6 percent of all electricity came from renewable resources such as wind, solar, geothermal, biomass and small hydroelectric facilities. Large hydro plants generated another 9.2 percent of our electricity (CEC 2014a).

Natural gas is the second most widely used energy source in California. Depending on yearly conditions, 40 to 45 percent of the total is burned for electricity generation; 10 percent is consumed in facilitating the extraction of oil and gas, while the rest is used for everything from space heating to fuel for bus fleets (CEC 2014a).

Natural gas-fired generation has been the primary source of electricity generation in the State for years and fuels over half of electricity consumption, both from in-state and imported sources (CEC 2014a). As natural gas is a resource that can fill in the gaps from other power resources, its total use can vary greatly from year to year. The availability of hydroelectric resources, the emergence of renewable resources for electricity generation, and overall consumer demand are the variables that shape natural gas use consumption. In 2012, 23,323 million therms were consumed statewide.

In 2007, total gasoline consumed in the State was 15,672,334,029 gallons, a decrease of about 153 gallons from the previous year. Diesel fuel is the second largest transportation fuel in California behind gasoline. In 2007, more than 3,000,000,000 gallons of diesel were consumed.

Regional

SDG&E is the owner and operator of natural gas and electricity transmission and distribution infrastructure in the county. SDG&E is regulated by the CPUC. The CPUC sets the gas and electricity rates for SDG&E and is responsible for making sure that California utilities' customers have safe and reliable utility service at reasonable rates. The project's energy needs would be supplied through the various combinations of energy resources available within the project area, and involving the anticipated future energy resource use patterns discussed in this section.

There are no energy utility facilities located within the undeveloped project site. There are three major electricity-generating power plants in the County, which include the Palomar Energy Center, Otay Mesa Energy Center, and the Encina Power Station (SDG&E 2013a). There are also a number of smaller electricity generating plants in the county that are used as backup during times of peak power demand, which are referred to as "peakers." These in-region assets are currently capable of generating approximately 3,071 MW of electricity. SDG&E also provides natural gas in the amount of 150 million cubic feet per day for residential users and 70 million cubic feet per day for commercial and other users (SDGE 2013b).

Power generation and power use are not linked geographically. Electricity generated within the San Diego region is not dedicated to users in the SDG&E service area. Instead, electricity generated in the County is fed into the statewide utility grid and made generally available to users statewide. SDG&E purchases electricity from this statewide grid, through various long-term contracts. Similarly, natural gas is also imported into southern California and originates from any of a series of major supply basins located from Canada to Texas. Gas is pumped out and shipped to receipt points that connect with major interstate gas pipelines.

Table 3.1-15~~13~~ lists SDG&E's current energy sources. As shown in Table 3.1-15~~14~~, SDG&E renewable energy includes biomass and waste, geothermal, small hydroelectric, solar, and wind sources. SDG&E obtained 19.2 percent of its energy from renewable resources in 2012. Additionally, SDG&E's other energy sources include coal, natural gas, nuclear and unspecified sources. As directed by the California RPS in SB 1078, SDG&E and other statewide energy utility providers are targeted to achieve a 33 percent renewable energy mix by 2020.

TABLE 3.1-15~~13~~
SDG&E POWER CONTENT

Energy Source	SDG&E 2012 Power Mix
Renewables	19.2%
- Biomass & waste	3.9%
- Geothermal	2.4%
- Small hydroelectric	0.1%
- Solar	3.4%
- Wind	9.4%
Coal	2.3%
Large Hydroelectric	-0.1%
Natural Gas	63.1%
Nuclear	0.9%
Unspecified	14.6%
TOTAL	**100%**

SOURCE: SDG&E 2013a.

Regulatory Framework

The following regulations and guidelines provide the framework for energy conservation. According to the majority of these programs and their requirements, the increased and growing demands for non-renewable energy supplies are best addressed through conservation.

Federal and state agencies regulate energy use and consumption through various means and programs. On the federal level, the U.S. Department of Transportation, the U.S. Department of Energy, and the EPA are three federal agencies with substantial influence over energy policies and programs. Generally, federal agencies influence and regulate transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy-related research and development projects, and through funding for transportation infrastructure improvements.

On the state level, the CPUC and the California Energy Commission (CEC) are two agencies with authority over different aspects of energy. The CPUC regulates utilities in the energy, rail, telecommunications and water fields. The CEC collects and analyzes energy-related data, prepares statewide energy policy recommendations and plans, promotes and funds energy efficiency programs, and adopts and enforces appliance and building energy efficiency standards.

Federal

Federal Energy Policy and Conservation Act and Amendments

Minimum standards of energy efficiency for many major appliances were established by the U.S. Congress in the federal Energy Policy and Conservation Act of 1975, and have been subsequently amended by succeeding energy legislation, including the federal Energy Policy Act of 2005. The Department of Energy is required to set appliance efficiency standards at levels that achieve the maximum improvement in energy efficiency that is technologically feasible and economically justified.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 established new standards for a few equipment types not already subjected to a standard, and updated some existing standards. Perhaps the most significant new standard it establishes is for general service lighting, which will be deployed in two phases. First, by 2012–2014 (phased over several years), common light bulbs will be required to use about 20–30 percent less energy than present incandescent bulbs. Second, by 2020, light bulbs must consume 60 percent less energy than today's bulb; this requirement will effectively phase out the incandescent light bulb.

Additional regulations at the federal level include Corporate Average Fuel Economy Standards, among others, described in subchapter 3.1.2.1.

State

Energy Action Plan

The CEC, the CPUC, and the Consumer Power and Conservation Financing Authority (called the CPA - which is now defunct), approved the final State of California Energy Action Plan in 2003. The plan establishes shared goals and specific actions to ensure that adequate, reliable, and reasonably-priced electrical power and natural gas supplies (CEC 2014b). At the beginning of 2008, the CEC and CPUC didn't find it necessary or productive to create a new energy action plan. As the state's energy policies have been significantly influenced by the passage of Assembly Bill 32, the California Global Warming Solutions Act of 2006, rather than produce a new Energy Action Plan, the CEC and CPUC have prepared instead an "update" that examines the state's ongoing actions in the context of global climate change. The update is prepared using the information and analysis prepared for the Integrated Energy Policy Report (IEPR) documents, as well as with recent CPUC decisions (CEC 2014b).

As described in subchapter 3.2.1.1, there are a host of regulations at the state level intended to reduce energy use and GHG emissions. These include, among others, AB1493-Light –duty Vehicle Standards, California Code of Regulations Title 24, Part 6-Energy Efficiency Standards, California Code of Regulations Title 24, Part 11-California Green Building Standards.

County of San Diego

SDG&E Long-Term Resource Plan

In 2004, SDG&E filed a long-term energy resource plan (LTRP) with the CPUC, which identifies how it will meet the future energy needs of customers in SDG&E's service area. The LTRP identifies several energy demand reduction (i.e., conservation) targets, as well as goals for increasing renewable energy supplies, new local power generation, and increased transmission capacity.

The LTRP sets a standard for acquiring 20 percent of SDG&E's energy mix from renewables by 2010 and 33 percent by 2020. The LTRP also calls for greater use of in-region energy supplies, including renewable energy installations. By 2020, the LTRP states that SDG&E intends to achieve and maintain the capacity to generate 75 percent of summer peak demand with in-county generation. The LTRP also identifies the procurement of 44 percent of its renewables to be generated and distributed in-region by 2020.

3.1.8.2 Analysis of Project Impacts and Determination of Significance

Section 15126.4 (a)(1) of the CEQA Guidelines states that an EIR shall describe feasible measures which could minimize significant adverse impacts, including, where relevant, inefficient and unnecessary consumption of energy.

CEQA Guidelines, Appendix F, Energy Conservation provides guidance for EIRs regarding potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing the inefficient, wasteful and unnecessary consumption of energy. The State Resources Agency amended Appendix F to make it clear that an energy analysis is mandatory. However, the Resources Agency also clarified that the energy analysis is limited to effects that are applicable to the project (Final Statement of Reasons for Regulatory Action [Resources Agency 2009]). Appendix F is not described as a threshold for determining the significance of impacts. Appendix F merely seeks inclusion of information in the EIR to the extent relative and applicable to the project. Therefore, as Appendix F indicates a particular emphasis should be focused on avoiding or reducing the inefficient, wasteful, and unnecessary consumption of energy. For the purpose of determining the significance of an impact in this EIR, implementation of the project would have significant energy impacts if it would:

1. Result in the wasteful and inefficient use of nonrenewable resources during its construction.

2. Result in the wasteful and inefficient use of nonrenewable resources during long-term operation.

Issue 1: Construction-Related Energy Use

Would the project result in the wasteful and inefficient use of nonrenewable resources during the construction phase of the project?

Analysis

The project construction would occur in five phases. Construction of the proposed project is expected to last approximately 10 years.

Grading and construction activities for these phases would consume energy through the operation of heavy off-road equipment, trucks, and worker traffic.

Construction equipment fuel consumption for each of the construction phases was based on equipment lists provided by the project applicant. The construction equipment, summarized in Table 3.1-16~~14~~, is anticipated to be used in each phase of the project. Based on project design consideration AQ-DC-3, which is included in the Specific Plan, Tier III, or higher, construction equipment will be used, with the exception of concrete/industrial saws, generators, welders, air compressors, or construction equipment where Tier III, or higher, is not available. Additionally, Tier IV equipment would likely be used in the final phases due to ARB off-road emissions control regulations. The fuel consumption of off-road equipment calculated in this analysis is based on the tier levels presented in Table 3.1-16~~14~~, as well as statewide data sets for horsepower and load factors provided as part of the project air quality analysis.

TABLE 3.1-16~~14~~
CONSTRUCTION EQUIPMENT LIST

Equipment Type	Quantity	Tier	Horsepower	Load Factor
Concrete/industrial saws	1	II	81	0.73
Crawler tractors	1	III	208	0.43
Tractors/loaders/backhoes	1	III	98	0.37
Crawler tractors	2	III	208	0.43
Rubber-tired loaders	3	III	200	0.36
Bore/drill rigs	2	III	206	0.5
Crawler tractors	3	III	208	0.43
Graders	1	III	175	0.41
Rubber-tired loaders	2	III	200	0.36
Scrapers	8	III	362	0.48
Cranes	1	III	226	0.29
Forklifts	3	III	89	0.2
Generator sets	2	II	84	0.74
Tractors/loaders/backhoes	3	III	98	0.37
Welders	1	II	46	0.45
Pavers	2	III	126	0.42
Paving equipment	2	III	131	0.36
Rollers	2	III	81	0.38
Air compressors	2	I	78	0.48

SOURCE: Appendix O.

Based on the above inventory of mostly off-road construction equipment construction-related fuel-energy consumption can be estimated. The total horsepower multiplied by the load factor, hours of use, and gallons per horsepower hour would result in approximately 462,524 gallons of diesel fuel per year, or approximately 4,625,240 gallons over the entire construction period, for the off-road construction equipment (see Table 3.1-16~~14~~ and Appendix O).

The on-road worker, vendor, and hauling trips would result in a total of 2,568 VMT per construction phase. As these trips would occur in a variety of different vehicles, a county wide average fuel consumption of 18.8 miles per gallon was applied to the VMT per phase (Resources Agency 2009). Based on these factors, it is predicted that 241,392 gallons of fuel would be consumed by on-road worker, vendor, and hauling trips during construction of the project. .

Through the use of more efficient Tier III and IV equipment, which uses clean-fuel technologies or electric-based engines, wherever feasible during construction total fuel-energy consumption would be reduced.

Project design feature AQ-DC-3, combined with local, state and federal regulations, which limit engine idling times and require recycling of construction debris, would reduce short-term energy demand due to project construction and would not result in a wasteful or inefficient use of energy.

Issue 2: Long-term Operational Energy Use

Guidelines for the Determination of Significance

Would the project result in the wasteful and inefficient use of nonrenewable resources during the long-term operation of the project?

Analysis

Long-term operational energy use associated with the project includes electricity and natural gas consumption by residents, energy consumption related to obtaining water, and fuel consumption by operation of vehicles.

Electricity and Natural Gas Consumption

As indicated in subchapter 3.1.2 of the EIR (Greenhouse Gas), the Specific Plan requires residential dwelling units and commercial development to exceed the 2008 Title 24 Part 6 energy efficiency standards by 30 percent. The project also includes design measures (see Table 1-3), which require: on-site generation of electricity through installing 2,000 kW of solar PV systems, installing high-efficiency lighting to achieve a 15 percent lighting energy reduction, using Smart Meters to reduce energy, and installing Energy Star certified appliances including clothes washers; dish washers; fans; and refrigerators, in all residential units. Energy Star certified appliances would also be required to be used in the assisted living facility.

Based on energy consumption data used in the GHG emission estimates, after implementation of project design features the residential uses would consume ~~36,936,930~~ 39,617,730 thousand British thermal units (kBtu) of natural gas and ~~8,797,235~~7,621,813 kilowatt hours (kWh) of electricity annually (RECON 2014f). The commercial uses, would consume ~~4,175,458~~8,674,444 kBTU of natural gas use and ~~2,279,057~~3,409,869 kWh of electricity annually. Thus, in total the project is predicted to consume ~~41,112,388~~ 48,292,174 kBTU of natural gas and ~~11,076,292~~ 11,031,682 kWh of electricity.

In addition to the design measures quantified for the GHG analysis, the Specific Plan includes other energy conservation measures that were not quantified due to the uncertainty of resident participation, such as the requirement to provide the infrastructure necessary to accommodate the future use of solar photovoltaic panels and/or systems, including prewiring homes to allow for rooftop solar and electric car installations. ~~wiring for roof mounted solar systems and a recharging connection for electric vehicles in the garage of all buildings~~.

Based on the "lower than average" energy use anticipated from the project due to project design considerations, ~~including~~ such as designing residential and commercial buildings to exceed 2008 Title 24 Part 6 energy efficiency standards by 30 percent, provision of on-site electrical generation, and providing energy star appliances in all residential units, the project would not result in the wasteful or inefficient use of nonrenewable resources during its long-term operation.

Water Conveyance

The provision of potable water to residences consumes large amounts of energy through its supply, treatment, and distribution. The total indoor water use for the project would be 182.4 million gallons of water per year (see Appendix O). This would result in 1,774,344 kWh for water supply, 20,248 kWh for water treatment, and 232,031 kWh for water conveyance. The total outdoor water use for the project would be 98.6 million gallons of water per year. This would result in the use of 958,615 kWh for water supply, 10,939 kWh for water treatment, and 125,358 kWh for water conveyance. However, as a design feature identified in the Specific Plan, the project would reduce potable water demand for both indoor and outdoor use by at least 20 percent. The reduction of water demand would result in a reduction of wasteful or inefficient water allowing the conservation of energy use associated with water use.

Fuel Consumption

Energy in the form of fuel (gasoline and diesel) would be consumed by vehicles associated with the project through generation of new vehicle trips. The project includes design measures to enhance walkability and to improve the on-site pedestrian network. The non-vehicular modes of travel, including walking and use of mass transit, would be encouraged through the provision of trails throughout the project's 25.3 acres of recreational open space, and by focusing higher residential densities adjacent to the planned mixed-use and commercial development.

Additionally, the project would provide interim transit services, as described in Section 1.0, for residents after 50 percent of the dwelling units constructed under Phase I are occupied. The availability of interim transit service would also encourage lower vehicle fuel consumption by providing a local transit option for residents. The interim transit service would continue until a transit linkage is provided by the local transit district.

Based on the findings of the GHG analysis, subsection 3.1.2, the project would result in a reduction of 1,537,111 vehicle miles traveled (VMT) than if it did not include these design features. This is an approximate 2.4 percent reduction in VMT over the VMT estimated for the project without these features. Based on an average projected fuel economy of 18.8 miles per gallon for 2020, the project would consume 81,761 fewer gallons of vehicle fuel annually. In addition to the project design features, various federal and state regulations on vehicle and fuel manufacturing would likely result in the substantial reduction of the project's vehicle fuel consumption each year into the future. Specifically, the CAFE, LCFS, Pavley, and LEV III regulations are anticipated to improve the fuel economy of vehicles.

Conclusion

Energy would be consumed through daily residential activities, the delivery of water for potable and irrigation purposes, and daily vehicle use by residents and visitors. While the long-term operation of the project would result in an increase in energy consumption compared to existing conditions, the project incorporates design measures (related to electricity, natural gas and water use) that require the project to exceed energy and water efficiency regulations under the 2008 Title 24 Part 6 and Part 11. In addition, the project is designed to reduce vehicle fuel consumption through promotion of alternative modes of transportation and trip reduction through provision of mixed-uses on-site. The project design features included in the Specific Plan also contain energy conservation measures that were not quantified due to the uncertainty of resident participation, such the requirement to provide the infrastructure necessary to accommodate the future use of solar photovoltaic panels and/or systems, including wiring for roof mounted solar systems and an recharging connection for electric vehicles in the garage of all buildings. These measures would further promote energy-efficiency and reduce future demand for energy from the project. Overall, the project therefore would avoid the inefficient, wasteful and unnecessary consumption of energy.

THIS PAGE IS INTENTIONALLY BLANK.