5.6 Greenhouse Gas Emissions

The analysis in this section of the EIR addresses the potential impacts associated with greenhouse gas (GHG) emissions that may occur due to implementation of the proposed Collier Park Renovations Project. The following discussion includes information based on the Greenhouse Gas Emissions Analysis prepared by Atkins (2012), which is provided as Appendix G of this EIR.

5.6.1 Regulatory Framework

5.6.1.1 Federal

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (USEPA) is the federal agency responsible for setting and enforcing the federal ambient air quality standards for atmospheric pollutants. The USEPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The USEPA also has jurisdiction over emission sources outside state waters (outer continental shelf), and establishes various emissions standards for vehicles sold in states other than California.

In 2006, 12 U.S. states and cities, in conjunction with several environmental organizations, sued to require the USEPA to regulate GHGs as a pollutant pursuant to the federal Clean Air Act (CAA). On April 2, 2007, the Supreme Court found that GHGs are air pollutants covered by the CAA. The Supreme Court held that the USEPA must determine whether or not GHG emissions from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare. On December 7, 2009, the USEPA signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

- Endangerment Finding: The USEPA finds that the current and projected concentrations of the six key well-mixed greenhouse gases — carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride — in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The USEPA finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action was a prerequisite for implementing GHGs standards for vehicles. In collaboration with the National Highway Traffic Safety Administration, the USEPA finalized emission standards for light-duty vehicles (2012-2016 model years) in May 2010 and heavy-duty vehicles (2014-2018 model years) in August 2011.

5.6.1.2 State

Assembly Bill 32, California Global Warming Solutions Act

In September 2006, the California State Legislature adopted Assembly Bill 32, the California Global Warming Solutions Act of 2006, which focuses on reducing GHG emissions in California. Assembly Bill 32 makes the CARB responsible for monitoring and reducing GHG emission, and continues the existing California Climate Action Team (CCAT) to coordinate statewide efforts and promote strategies that can be undertaken by many other California agencies. Under Assembly Bill 32, the CARB is required to adopt rules and regulations for quantifiable, verifiable, and enforceable emissions reduction measures that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020. The CARB has identified 427 million MT CO_2e as the total statewide aggregated 1990 GHG emissions level, which serves as the 2020 emissions limit (CARB 2007). The main strategies for reducing California's GHG emissions pursuant to Assembly Bill 32 are outlined in the Climate Change Scoping Plan (CARB 2008). The Climate Change Scoping Plan has a range of GHG emissions reduction actions which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and a cost-of-implementation fee to fund the program. In addition, the Climate Change Scoping Plan emphasizes the need to better connect land use and transportation planning to help the state achieve its GHG emissions reduction target for 2020.

California Air Resources Board

The California Air Resources Board (CARB), a part of the California Environmental Protection Agency (CalEPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, the CARB conducts research, sets state ambient air quality standards, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. The CARB also establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment, and sets fuel specifications to further reduce vehicular emissions.

The CARB Regional Targets Advisory Committee, which was appointed in January 2009 to help address the requirements of Senate Bill 375 (described below), was tasked with recommending a method by which each major region of California could reduce GHG emissions through more sustainable land use and transportation planning. In a report dated September 29, 2009, after approximately 13 public meetings in Sacramento, the Advisory Committee recommended that regional targets be expressed as a percent per-capita GHG emissions reduction from a 2005 base year. According to the Advisory Committee, this differs from the 1990 base year established in Assembly Bill 32 (described below) due to a lack of reliable regional transportation and land use data from 1990. The Advisory Committee also recommended that the CARB use an interactive process with the regional Metropolitan Planning Organizations, such as the San Diego Association of Governments (SANDAG), to set a single statewide uniform target that could be adjusted up or down to respond to regional differences. SANDAG proposed a regional target of reducing GHG emissions to seven percent below 2005 emissions by 2020 and to 13 percent below 2005 emissions by 2035.

California Energy Code

The California Energy Code (California Code of Regulations Title 24, Part 6), which is incorporated into the Building Energy Efficiency Standards, was first established in 1978 in response to a legislative mandate to reduce California's energy consumption. Although these standards were not originally intended to reduce GHG emissions, increased energy efficiency results in decreased GHG emissions because energy efficient buildings require less electricity and thus less consumption of fossil fuels which emits GHGs. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The current 2008 Building Energy Efficiency Standards (California Energy Commission 2010) includes changes from the previous standards that were adopted to:

- Provide California with an adequate, reasonably-priced, and environmentally-sound supply of energy.
- Respond to Assembly Bill 32, the Global Warming Solutions Act of 2006, which mandates that California must reduce its greenhouse gas emissions to 1990 levels by 2020.
- Pursue California energy policy that energy efficiency is the resource of first choice for meeting California's energy needs.
- Act on the California Energy Commission’s Integrated Energy Policy Report which finds that standards are the most cost effective means to achieve energy efficiency, expects the Building Energy Efficiency Standards to continue to be upgraded over time to reduce electricity and peak demand, and recognizes the role of the Building Energy Efficiency Standards in reducing energy related to meeting California's water needs and in reducing greenhouse gas emissions.
- Meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building codes.
- Meet Executive Order S-20-04, the Green Building Initiative, to improve the energy efficiency of nonresidential buildings through aggressive standards.

California Green Building Standards Code

The purpose of the California Green Building Standards Code (California Code of Regulations Title 24, Part 11) is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices in the following categories: (1) planning and design; (2) energy efficiency; (3) water efficiency and conservation; (4) material conservation and resource efficiency; and (5) environmental quality. These standards establish green building requirements for new residential and non-residential development, such as mandatory reductions in indoor water use. In addition, although the California Green Building Standards Code does not require energy efficiency beyond the Building Energy Efficiency Standards, it recommends a 15 percent increase in energy efficiency compared to Building Energy Efficiency Standards. Furthermore, non-residential projects are required to recycle at least 50 percent of construction waste. Such reductions in water, energy, and building materials use and solid waste generation would result in decreased GHG emissions.

Executive Order S-3-05

Executive Order S-3-05 (issued June 1, 2005) established the following GHG emissions reduction targets: (1) by 2010, reduce GHG emissions to 2000 levels; (2) by 2020, reduce GHG emissions to 1990 levels; and (3) by 2050, reduce GHG emissions to 80 percent below 1990 levels. The initial CCAT Report in 2006 contained recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met. The latest CCAT Report in 2010 expands on the policy-oriented 2006 Report and provides new information and scientific findings. The 2010 Report includes development of new climate and sea-level projections using new information and tools that have become available since the preparation of the previous report, and evaluation of climate change within the context of broader social changes such as land-use changes and demographic shifts (CCAT 2010). The action items in the 2010 Report focus on the preparation of the Climate Adaptation Strategy, as required by Executive Order S-13-08 (described below).

Executive Order S-13-08

Executive Order S-13-08 (issued November 14, 2008), the Climate Adaptation and Sea Level Rise Planning Directive, provides clear direction for how the State should plan for future climate impacts. Executive Order S-13-08 calls for the implementation of four key actions to reduce California's vulnerability to climate change:

1) Initiate California's first statewide Climate Adaptation Strategy that will assess the State's expected climate change impacts, identify where California is most vulnerable, and recommend climate adaptation policies;
2) Request the National Academy of Science establish an expert panel to report on sea level rise impacts in California in order to inform state planning and development efforts;
3) Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new and existing projects; and
4) Initiate studies on critical infrastructure projects, and land-use policies, vulnerable to sea level rise.

The California Natural Resources Agency coordinated with 10 state agencies, multiple scientists, a consulting team, and stakeholders to develop the California Climate Adaptation Strategy (California Natural Resources Agency 2009), which summarizes the best-known science to assess the vulnerability of the State to climate change impacts, and outlines possible solutions that can be implemented within and across state agencies to promote resiliency.

Senate Bill 375, Sustainable Communities and Climate Protection Act

Senate Bill 375, the Sustainable Communities and Climate Protection Act of 2008, enhances California's ability to reach its Assembly Bill 32 goals by promoting good planning with the goal of more sustainable communities. Senate Bill 375 requires the CARB to develop regional GHG emissions reduction targets for passenger vehicles to be achieved by 2020 and 2035, and requires the regional Metropolitan Planning Organizations, such as SANDAG, to develop Sustainable Communities Strategies in their regional transportation plans. The Sustainable Communities Strategies demonstrate how each region will meet the CARB's emissions reduction targets through integrated land use, housing, and transportation planning to reduce the amount of vehicle miles travelled within their respective regions.

5.6.1.3 Regional

SANDAG Climate Action Strategy

The Climate Action Strategy (SANDAG 2010) serves as a guide to help policymakers to address climate change as they make decisions to meet the needs of a growing population, maintain and enhance quality of life, and promote economic stability. The Climate Action Strategy focuses on three essential;

areas where regional and local governments have the authority or opportunity to influence GHG emissions: (1) land use patterns, transportation infrastructure, and related public investments; (2) building construction and energy usage; (3) government operations. A major purpose of the Climate Action Strategy is to identify land use and transportation policy measures that could help SANDAG meet or exceed Senate Bill 375 targets for reducing GHG emissions from passenger cars and light-duty trucks. The policy measures identified in the Climate Action Strategy are intended to be a list of potential options for consideration as SANDAG updates its long-term planning documents such as the Regional Transportation Plan and the Regional Comprehensive Plan, and as local jurisdictions update their general plans and other community plans.

5.6.2 Existing Conditions

5.6.2.1 Global Climate Change Overview

Global climate change is an alteration in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. The earth's climate is in a state of constant flux with periodic warming and cooling cycles. For most of the earth's geologic history, these periods of warming and cooling have been the result of many complicated, interacting natural factors such as volcanic eruptions, changes in the earth's orbit, and the amount of energy released from the sun. However, since the beginning of the Industrial Revolution around 1750, the average temperature of the earth has been increasing at a rate that is faster than can be explained by natural climate cycles alone. With the Industrial Revolution came an increase in the combustion of carbon-based fuels such as wood, coal, oil, natural gas, and biomass. Industrial processes have also created emissions of substances that are not found in nature. These emissions, in turn, have led to a marked increase in the accumulation of gases in the atmosphere that have been shown to influence the earth's climate. These gases, termed GHGs, influence the amount of heat that is trapped in the earth's atmosphere, analogous to the way a greenhouse retains heat. Because recently observed increased concentrations of GHGs in the atmosphere are related to increased emissions resulting from human activity, the current cycle of "global warming" is generally believed to be largely due to human activity.

5.6.2.2 GHGs of Primary Concern

California Health and Safety Code Section 38505(g) defines GHGs to include the following compounds: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride. Carbon dioxide, methane, and nitrous oxide are the GHGs of primary concern in this analysis. Descriptions of these compounds and their sources are provided below. Fluorinated gases (hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride) are synthetic, powerful GHGs that are emitted from a variety of industrial processes, including aluminum production, semiconductor manufacturing, magnesium processing, electrical transmission and distribution, and as a by-product of chlorodifluoromethane production. Since the proposed project would not include any industrial processes, these GHGs are excluded from this analysis.

Individual GHGs have varying heat-trapping properties and atmospheric lifetimes. Each GHG is compared to carbon dioxide with respect to its ability to trap infrared radiation, its atmospheric lifetime, and its chemical structure, in order to determine its carbon dioxide equivalent (CO_2e). The CO_2e methodology normalizes various GHG emissions to a consistent measure to allow for direct comparison. For example, methane is a GHG that is 21 times more potent than carbon dioxide; therefore, one metric ton (MT) of methane is equal to 21 MT CO_2e. Table 5.6-1 identifies the CO_2e and atmospheric lifetimes of the GHGs of primary concern.

Table 5.6-1 Carbon Dioxide Equivalents and Atmospheric Lifetimes of GHGs

GHG	Chemical Formula	Carbon Dioxide Equivalent (CO_2e)	Atmospheric lifetime (years)
Carbon dioxide	CO_2	1	50-200
Methane	CH_4	21	12
Nitrous oxide	N_2O	310	114

Source: USEPA 2012

Carbon Dioxide

Carbon dioxide is the primary greenhouse gas emitted through human activities. Carbon dioxide enters the atmosphere through the burning of fossil fuels, solid waste, trees and wood products, and as a result of other chemical reactions such as through the manufacturing of cement. Globally, the largest source of carbon dioxide emissions is the combustion of fossil fuels in power plants, automobiles, industrial facilities, and other similar sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and petroleum-based products uses also produce carbon dioxide emissions. Carbon dioxide is removed from the atmosphere (or “sequestered”) as part of the biological carbon cycle. Billions of tons of atmospheric carbon dioxide are sequestered by oceans and growing plants (also known as “sinks”) and are emitted back into the atmosphere annually through respiration, decay, and combustion (also known as “sources”). When in balance, the total carbon dioxide sinks and sources from the entire carbon cycle are roughly equal. However, since the Industrial Revolution, human activities such as the burning of fossil fuels and deforestation have increased carbon dioxide concentrations in the atmosphere.

Methane

Methane is emitted from a variety of human-related and natural sources. Human-related sources of methane include fossil fuel production and transport, animal husbandry, rice cultivation, biomass burning, and waste management (i.e., decay of organic waste in landfills). Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and wildfires. Methane emission levels from a source can vary significantly from one country or region to another, depending on many factors such as climate, industrial and agricultural production characteristics, energy types and usage, and waste management practices. For example, temperature and moisture have a significant effect on the anaerobic digestion process, which is one of the key biological processes that cause methane emissions in both human-related and natural sources. Also, the implementation of technologies to capture and utilize methane from sources such as landfills, coal mines, and manure management systems affects the emission levels from these sources. It is estimated that 60 percent of global methane emissions are related to human activities (USEPA 2012).

Nitrous Oxide

Nitrous oxide is emitted from a variety of human-related and natural sources. Human-related sources of nitrous oxide include agricultural soil management, animal manure management, sewage treatment, combustion of fossil fuel and solid waste, adipic (fatty) acid production, and nitric acid production. Nitrous oxide is also produced naturally through sources associated with the biological nitrogen cycle, particularly microbial action in wet tropical forests. Nitrous oxide emission levels from a source can vary significantly from one country or region to another, depending on many factors such as industrial and agricultural production characteristics, combustion technologies, waste management practices, and climate. For example, heavy utilization of synthetic nitrogen fertilizers in crop production typically results in significantly more nitrous oxide emissions from agricultural soils than that occurring from less intensive, low-tillage techniques. Also, the presence or absence of control devices on combustion sources, such as catalytic converters on automobiles, can have a significant effect on the level if nitrous oxide emissions from these types of sources. It is estimated that 40 percent of global nitrous oxide emissions are related to human activities (USEPA 2012).

5.6.2.3 GHG Inventories

In an effort to evaluate and reduce the potential adverse impacts of global climate change, GHG inventories have been compiled to estimate the level of emissions and removals. The global, national, statewide, and countywide GHG inventories are summarized below.

Global

Worldwide anthropogenic GHG emissions in 2004 were approximately 49,000 million MT CO_2e, including ongoing emissions from industrial and agricultural sources and emissions from land use changes such as deforestation and biomass decay (Intergovernmental Panel on Climate Change 2007). Carbon dioxide emissions from fossil fuels accounted for 56.6 percent of the total GHG emissions, while carbon dioxide emissions from all sources accounted for 76.7 percent of the total GHG emissions. Methane emissions accounted for 14.3 percent of the total GHG emissions. Nitrous oxide emissions accounted for 7.9 percent of total GHG emissions.

The Global Carbon Project releases an annual update of the global carbon budget and trends. According to the 2010 Carbon Budget (Global Carbon Project 2011), the atmospheric carbon dioxide concentration in 2010 was 389.6 parts per million (ppm), 39 percent above the concentration at the start of the Industrial Revolution (about 278 ppm in 1750). The 2010 concentration is the highest during the last 800,000 years. The annual growth rate of atmospheric carbon dioxide was 2.36 ppm in 2010, one of the largest growth rates in the past decade. Although carbon dioxide emissions from deforestation and other land use changes in the 2000s decade have declined about 25 percent from the 1990s decade, carbon dioxide emissions from fossil fuels in 2010 were the highest in human history.

United States

The USEPA's Inventory of U.S. GHG Emissions and Sinks provides a comprehensive emissions inventory of the nation's primary anthropogenic sources and sinks of GHGs back to 1990. According to the 1990-2010 Inventory (USEPA 2012), U.S. GHG emissions totaled 6,821.8 million MT CO_2e in 2010, which represents a 10.5 percent increase from 1990 levels. From 2009 to 2010, emissions increased by 3.2 percent. This increase was primarily due to an increase in economic output resulting in an increase in energy consumption across all sectors, and much warmer summer conditions resulting in an increase in electricity demand for air conditioning that was generated primarily by combusting coal and natural gas.

State of California

The State of California is a substantial contributor of GHG emissions, with the second largest GHG emissions in the U.S. and the 14^{th} largest carbon dioxide emissions in the world. According to the 2000-

2009 California GHG Emissions Inventory (CARB 2011), total California GHG emissions were 457 million MT CO_2e in 2009, which represents a 5.5 percent from 1990 levels. From 2008 to 2009, emissions decreased by 5.8 percent from 2008 to 2009. Table 5.6-2 summarizes California GHG emissions by economic sectors. As shown in Table 5.6-2, the transportation sector was the largest contributor to California GHG emissions, followed by the industrial sector and electricity generation from both in-state and imported sources.

Table 5.6-2 State of California GHG Emissions by Economic Sector (2009)

Economic Sector	GHG Emissions (million MT CO_2e)	Percent of Total GHG Emissions
Agriculture	32.1	7.0
Commercial	14.3	3.1
Electricity Generation (imports)	48.4	10.6
Electricity Generation (in-state)	56.2	12.3
Forestry (excluding sinks)	0.2	0.04
Industrial	89.3	19.5
Residential	28.6	6.3
Transportation	172.9	37.9
Unspecified(1)	14.7	3.2
Total GHG Emissions(2)	**456.8**	**100**

(1) Unspecified includes emissions from evaporative losses and ozone-depleting substances substitute use, which could not be attributed to an individual sector.
(2) Sum of above values may not exactly equal the totals due to rounding.
Source: CARB 2011

San Diego County

The University of San Diego School of Law Energy Policy Initiatives Center prepared a detailed regional GHG inventory for San Diego County that considers the unique characteristics of the region in calculating emissions. According to the San Diego County GHG Inventory (University of San Diego School of Law 2008), San Diego County GHG emissions were 34 million MT CO_2e in 2006, which represents an 18 percent increase from 1990 levels. Table 5.6-3 summarizes San Diego County GHG emissions by category. As shown in Table 5.6-3, on-road transportation was the largest contributor to San Diego County GHG emissions, followed by electricity and natural gas end uses.

City of La Mesa

The City of La Mesa conducted a GHG inventory for its government operations, as well as for the overall community. According to the 2005 GHG Emissions Inventory (City of La Mesa 2005), government operations GHG emissions were 3,057 MT CO_2e and community GHG emissions were 535,827 MT CO_2e in 2005. Table 5.6-4 summarizes government operations GHG emissions by sector and Table 5.6-5 summarizes the community GHG emissions by sector. As shown in Table 5.6-4, employee commutes were the largest contributor to government operations GHG emissions, followed by the vehicle fleet and buildings/facilities. As shown in Table 5.6-5, the transportation sector was the largest contributor to community GHG emissions, followed by the commercial/industrial and residential sectors.

Table 5.6-3 San Diego County GHG Emissions by Category (2006)

Category	GHG Emissions (million MT CO_2e)	Percent of Total GHG Emissions
On-Road Transportation	16	46
Electricity	9	25
Natural Gas End Uses	3	9
Industrial Processes and Products	1.6	5
Civil Aviation	1.7	5
Water-Borne Navigation	0.1	0.4
Off-Road Equipment and Vehicles	1.3	4
Rail	0.3	1
Waste	0.7	2
Other Fuels (Propane, Kerosene, Wood, etc.)/Other	1.1	4
Agriculture/Forestry/Land Use	0.4	2
Total GHG Emissions[(1)]	**34**	**100**

(1) Sum of above values may not exactly equal the totals due to rounding.
Source: University of San Diego School of Law 2008

Table 5.6-4 City of La Mesa Government Operations GHG Emissions by Sector (2005)

Sector	GHG Emissions (MT CO_2e)	Percent of Total GHG Emissions
Employee Commutes	998	32
Vehicle Fleet	863	28
Buildings/Facilities	663	22
Public Lighting	413	14
Government Generated Solid Waste	115	4
Water Transport	5	0.2
Total GHG Emissions[(1)]	**3,057**	**100**

(1) Sum of above values may not exactly equal the totals due to rounding.
Source: City of La Mesa 2005

Table 5.6-5 City of La Mesa Community GHG Emissions by Sector (2005)

Sector	GHG Emissions (MT CO_2e)	Percent of Total GHG Emissions
Transportation	374,888	70
Commercial/Industrial	75,013	14
Residential	69,396	13
Solid Waste	13,942	3
Wastewater	2,589	0.5
Total GHG Emissions[(1)]	**535,827**	**100**

(1) Sum of above values may not exactly equal the totals due to rounding.
Source: City of La Mesa 2005

5.6.2.4 Regional Adverse Effects of Climate Change

The San Diego Foundation's Regional Focus 2050 Working Paper and Technical Assessment explored what the San Diego region would be like in the year 2050 if current climate change trends continue. The paper projected potential adverse effects on the San Diego region related to climate, energy needs, public health, wildfires, water supply, sea level, and ecosystems. The climate model simulations exhibited warming across San Diego County, ranging from about 1.5 to 4.5 degrees Fahrenheit, particularly in inland areas. Temperature changes for areas along the coast would be moderated by the influence of the Pacific Ocean. Without adequate planning, the increase in peak demand for electricity for cooling could result in blackouts and power outages. Extreme heat conditions in the San Diego region are also a public health concern, especially with an aging population. Other health concerns include increased ozone air pollution levels due to an increase in sunny days, which can exacerbate asthma and other respiratory and cardiovascular diseases; increased fire-related injuries and death as intense wildfires occur more frequently; and more cases of mosquito-related West Nile Virus, tropical diseases such as malaria and dengue fever, and coastal algal blooms, which can harbor toxic bacteria and other diseases. Drought years might occur as much as 50 percent more often and be considerably drier. Even with plans in place to conserve, recycle, and augment our available water, it is estimated San Diego County could face an 18 percent shortfall in water supply by 2050. Rising sea levels will also have a major impact on the San Diego region's environment and economy, particularly in coastal areas. High tide flooding will threaten low-lying coastal communities and impact military, port, and airport operations. High surf events and rising sea levels will cause even greater coastal erosion. Climate change will also add to the pressures on the variety of habitats and species in the County. The locations where environmental conditions are suitable for a particular species will shift with climate change. To survive, some animals and plants will have to relocate to find new habitat or potentially face extinction.

5.6.3 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a significant impact associated with GHG emissions would occur if implementation of the proposed project would:

- **Threshold 1:** Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
- **Threshold 2:** Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

5.6.4 Impacts

5.6.4.1 Direct and Indirect Generation of GHG Emissions

Threshold 1: Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

The CEQA Guidelines do not quantify the amount of GHG emissions that would constitute a significant impact on the environment. Instead, the determination of the significance of GHG emissions is left to the lead agency, which is authorized to consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts (CEQA Guidelines Sections

15064.4(a) and 15064.7(c)). In the absence of its own GHG emissions threshold, the City of La Mesa has decided to use the County of San Diego's Guidelines for Determining Significance – Climate Change (County of San Diego 2012). The County's guidelines are based on regional data, including the incorporated cities, and as such may be used by lead agencies in the region other than the County of San Diego. The purpose of the County's guidelines is to ensure that new development achieves its fair share of GHG emissions reductions needed to meet the statewide Assembly Bill 32 mandate. The County's guidelines establish a screening level threshold of 2,500 MT CO_2e emitted annually during either construction or operation. Projects that would emit more than 2,500 MT CO_2e annually during either construction or operation would result in a potentially significant impact.

Construction Impacts

Construction of the proposed project would result in temporary increases in GHG emissions. These emissions would be generated primarily from construction equipment exhaust, construction worker vehicle trips, and heavy duty truck trips. GHG emissions were estimated using the worst-case activity data and the emission factors included in the CalEEMod model (Version 2011.1.1), which takes into account the hours of operation, load factor, and the emission factors for each piece of equipment. For detailed model assumptions and output, please refer to Attachment A of the Greenhouse Gas Emissions Analysis (Atkins 2012).

The proposed project would be completed in phases, generally corresponding to the four project areas described in Chapter 4, Project Description, of this EIR: Panhandle, Spring House, History Hill, and Collier Club House. Each phase of construction is anticipated to occur over a six to 14 month period. The Panhandle area would be constructed first and would be completed prior to the construction of the other three phases. The remaining areas may be constructed in any order and may be constructed concurrently.

Grading of the entire site would require approximately 34,100 cubic yards (CY) of cut and approximately 14,800 CY of fill. Two options for site grading are being considered. The first grading option would balance the cut/fill on-site. Under this option, the History Hill and Collier Club House areas would be graded to reduce the steepness of the slopes within each area, and the cut materials from these areas would be used to fill the natural bowl in the Panhandle area. The second grading option would not balance the cut/fill on-site. This option would result in the import of material to the Panhandle area and the export of a greater amount of material from the History Hill and Collier Club House areas, and it would allow grading of the park site to occur in phases. This analysis assumes the second grading option because it would require more truck trips for hauling and is the worst-case scenario in terms of GHG emissions. For detailed construction assumptions specific to each of the four project phases, please refer to the Construction Impacts section of the Greenhouse Gas Emissions Analysis (Atkins 2012).

The annual GHG emissions generated during construction of each of the four project phases are presented in Table 5.6-6. With the exception of the Collier Club House phase, all of the project phases would be completed within 12 months; therefore, the total GHG emissions from each phase are also the phase's annual GHG emissions. To be conservative, the total GHG emissions from the Collier Club House phase, which would be constructed over approximately 14 months, are included in the annual GHG emissions for this phase. As shown in Table 5.6-6, none of the individual project phases would result in construction annual GHG emissions that would exceed 2,500 MT CO_2e. The Panhandle area would be constructed first and would be completed prior to the start of construction of the remaining park areas. Construction of this phase would result in annual GHG emissions of 716 MT CO_2e, which is below the significance threshold. However, the Spring House, History Hill, and Collier Club House phases may be constructed concurrently. The worst-case construction scenario assumes concurrent construction of these three phases in one year. As shown in Table 5.6-6, the worst-case construction scenario would result in annual GHG emissions of 1,354 MT CO_2e, which is below the significance threshold of 2,500 MT CO_2e. Therefore, impacts associated with the generation of GHG emissions during construction of the proposed project would be less than significant.

Table 5.6-6 Construction Annual GHG Emissions

Project Phase (year of construction)	Annual GHG Emissions[(2)] (MT CO_2e)
Panhandle (2013)	716
Spring House (2014)	137
History Hill (2014)	344
Collier Club House (2014)	873
Worst Case Annual Emissions[(1)]	1,354
Significance Threshold	2,500
Significant Impact?	*No*

[(1)] Worst case assumes concurrent construction of the Spring House, History Hill, and Collier Club House phases in 2014. (The Panhandle phase would be completed prior to construction of these phases.)
[(2)] Emission quantities are rounded to the nearest whole number.
Source: CalEEMod Version 2011.1.1 (For model output, please refer to Attachment A of the Greenhouse Gas Emissions Analysis [Atkins 2012].)

Operational Impacts

Operation of proposed project would not include any stationary sources of GHG emissions; however, operation would directly result in GHG emissions from vehicle trips associated with visitors to the park, and indirectly result in GHG emissions from electricity, water use, wastewater generation, and solid waste disposal associated with general park use and maintenance. GHG emissions were estimated using the CalEEMod model (Version 2011.1.1). Estimates are based on the default CalEEMod assumptions and generation rates for a city park, except where noted in the discussion of individual emissions sources below. For detailed model assumptions and output, please refer to Attachment A of the Greenhouse Gas Emissions Analysis (Atkins 2012).

Mobile source (vehicular) GHG emissions are based on the worst-case trip generation of approximately 851 daily vehicle trips identified in the Traffic Impact Analysis prepared for the proposed project (Chen Ryan Associates 2012). Based on the worst-case trip generation and default CalEEMod trip lengths for city parks, park visitors would generate approximately 1,805,305 vehicle miles travelled per year at buildout of the Collier Park renovations. Estimated annual GHG emissions resulting from these vehicle trips would be approximately 917 MT CO_2e.

Electricity would be required for security and amenities lighting and for operation of the proposed club house building, as well as for speakers, microphones, and other equipment for events at the proposed amphitheater and outdoor event area. Electricity and natural gas usage for the proposed project is based on the CalEEMod energy usage rates for structures that would require minimal energy demand (warehouses). This assumption takes into account the short-term electricity use increases associated with events at the amphitheater, outdoor event area, and club house building, which would result in a higher electricity demand than a typical city park. Based on event data for the existing Harry Griffen Park in La Mesa, which includes an amphitheater and community center, approximately 17 events would occur at Collier Park each month. Electricity usage at buildout of the proposed project would be approximately 32,000 kilowatt hours per year, which would generate approximately 11 MT CO_2e annually. In addition, natural gas could potentially be required for operation of the club house building if a heater or kitchen facilities are included. Natural gas usage at buildout of the proposed project would be approximately 3 therms per year, which would generate approximately 2 MT CO_2e annually.

Solid waste generation at buildout of the proposed project would be approximately 8 tons per year, which would generate approximately 4 MT CO_2e annually. Water usage for restrooms, events, and landscaping at buildout of the proposed project would be approximately 9 million gallons per year, which would generate approximately 37 MT CO_2e annually.

The annual GHG emissions that would result from operation of the proposed project are presented in Table 5.6-7. As shown in Table 5.6-7, operation of the proposed project would generate approximately 971 MT CO_2e per year, which is below the significance threshold of 2,500 MT CO_2e. Therefore, impacts associated with the generation of GHG emissions during operation of the proposed project would be less than significant.

Table 5.6-7 Existing and Projected Operational Annual GHG Emissions

Emission Source	Net Increase in Annual GHG Emissions[1] (MT CO_2e)
Vehicles	917
Electricity	11
Natural Gas	2
Solid Waste	4
Water Use	37
Total	971
Significance Threshold	2,500
Significant impact?	*No*

[1] Emission quantities are rounded to the nearest whole number.
Source: CalEEMod Version 2011.1.1 (For model output, please refer to Attachment A of the Greenhouse Gas Emissions Analysis [Atkins 2012].)

GHG Emissions Reduction Measures

The California Air Pollution Control Officers Association (CAPCOA) report, Quantifying GHG Mitigation Measures (CAPCOA 2010), includes numerous project-level mitigation measures for GHG emissions associated with land use, transportation, energy use, water use, solid waste, construction, and other related areas. As shown above in Table 5.6-6 and Table 5.6-7, GHG emissions resulting from construction and operation of the proposed project would be less than significant and would not require mitigation. However, to further reduce its GHG emissions, the proposed project would voluntarily incorporate the CAPCOA recommended GHG emissions reduction strategies identified in Table 5.6-8.

Table 5.6-8 GHG Emissions Reduction Strategies Implemented during Construction and Operation

Strategy	Project Consistency
SW-2. Solid Waste. Recycle Demolished Construction Material.	Demolished material from redevelopment of the Panhandle area would be recycled in accordance with the City's Construction and Demolition Debris Diversion Ordinance (La Mesa Municipal Code Chapter 14.27).
SDT-1. Neighborhood/Site Enhancement. Provide Pedestrian Network Improvements	In the Panhandle area, three pedestrian entrances would be constructed along Palm Avenue, replacing two existing steeply sloped stair/ramp paths. At least one entrance from Upland Street would be added to encourage pedestrian use by residents in the neighborhood to the east. Another walking path would be constructed from the park's main entrance at the corner of Palm Avenue and Pasadena Avenue, extending southeast to the new playgrounds. This entrance walkway would also extend to the Navy housing project adjacent to the south side of the park. In the Collier Club House area, two pedestrian crossings would be installed across Pasadena Avenue. One pedestrian crossing would provide access between the Collier Club House and History Hill areas near the intersection of Upland Street and Pasadena Avenue. The other pedestrian crossing would provide access between the Collier Club House area and the Spring House area in the central portion of the park. A concrete sidewalk would be constructed along the western side of Upland Street for the length of the park boundary along this roadway. A connected sidewalk would also extend from Upland Street into the center of the park along the northern side of Pasadena Avenue, terminating at the pedestrian crossing in the Collier Club House area. The portion of the sidewalk within the park boundary would include a handicap ramp and landing system. A separate, unpaved path would be constructed between the plaza area, near the intersection of Upland Street and Pasadena Avenue, and the new club house building. To the extent possible, all walking paths would be handicap accessible and appropriate for all abilities. Paths would be placed to encourage physical activity and facility walkability. Walking paths would create connections within the park and with surrounding streets.
TST-2. Transit System Improvements. Implement Transit Access Improvements.	An enhanced bus stop would be provided at the northwestern corner of the park along Palm Avenue.
WUW-2. Water Use. Adopt a Water Conservation Strategy	Excluding turf areas, the park would be landscaped with native vegetation using low water demand techniques consistent with the City's Water Efficient Landscape Ordinance (La Mesa Municipal Code Chapter 14.29).
WUW-3. Water Use. Design Water-Efficient Landscapes	
WUW-4. Water Use. Use Water-Efficient Landscape Irrigation Systems	
WUW-6. Water Use. Plant Native or Drought-Resistant Trees and Vegetation	

Source: CAPCOA 2010

5.6.4.2 Applicable GHG Emissions Reduction Plan, Policy, or Regulation

Threshold 2: Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

The applicable GHG emissions reduction plan, policy, or regulation for the proposed project is Assembly Bill 32 and the associated Climate Change Scoping Plan, which establish a statewide plan for achieving the GHG emissions levels required by Executive Order S-3-05. The proposed project is consistent with Assembly Bill 32 and the Climate Change Scoping Plan because both construction and operational GHG emissions would be below the significance threshold of 2,500 MT CO_2e, which the City of La Mesa has determined is the appropriate numerical threshold to ensure that new development achieves its fair share of GHG emissions reductions to meet the statewide Assembly Bill 32 mandate. Furthermore, although the construction and operational GHG emissions would be below the significance threshold, the proposed project would voluntarily incorporate the CAPCOA-recommended GHG emissions reduction strategies identified in Table 5.6-8 to further reduce its GHG emissions. Therefore, the proposed project would not conflict with Assembly Bill 32 and the Climate Scoping Plan. Impacts would be less than significant.

5.6.5 Mitigation Measures

5.6.5.1 Direct and Indirect Generation of GHG Emissions

No significant impacts related to the direct and indirect generation of GHG emissions would result from implementation of the proposed project. Therefore, no mitigation measures are required.

5.6.5.2 Applicable GHG Emissions Reduction Plan, Policy, or Regulation

No significant impacts related to the applicable GHG emissions reduction plan, policy, or regulation would result from implementation of the proposed project. Therefore, no mitigation measures are required.

5.6.6 Significance Determination

The significance of GHG emissions impacts before and after mitigation is summarized in Table 5.6-9. Implementation of the proposed project would not result in any significant impacts related to the direct and indirect generation of GHG emissions or the applicable GHG emissions reduction plan, policy, or regulation. Therefore, impacts associated with GHG emissions would be less than significant and no mitigation is required.

Table 5.6-9 Summary of Significance of GHG Emissions Impacts

Issue	Significance before Mitigation	Mitigation	Significance after Mitigation
Direct and Indirect Generation of GHG Emissions	Less than Significant	None	Less than Significant
Applicable GHG Emissions Reduction Plan, Policy, or Regulation	Less than Significant	None	Less than Significant