4.4 GREENHOUSE GAS EMISSIONS/CLIMATE CHANGE

This section addresses the proposed project's contribution to cumulative impacts to global climate change.

4.4.1 Environmental Setting

a. Climate Change and Greenhouse Gases. Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. The term "climate change" is often used interchangeably with the term "global warming," but "climate change" is preferred to "global warming" because it helps convey that there are other changes in addition to rising temperatures. The baseline against which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate is continuously changing, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming during the past 150 years. Per the United Nations Intergovernmental Panel on Climate Change (IPCC, 2013), the understanding of anthropogenic warming and cooling influences on climate has led to a high confidence (95 percent or greater chance) that the global average net effect of human activities has been the dominant cause of warming since the mid-20th century (IPCC, 2013).

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Observations of CO_2 concentrations, globally-averaged temperature, and sea level rise are generally well within the range of the extent of the earlier IPCC projections. The recently observed increases in CH_4 and N_2O concentrations are smaller than those assumed in the scenarios in the previous assessments. Each IPCC assessment has used new projections of future climate change that have become more detailed as the models have become more advanced.

Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and sulfur hexafluoride (SF_6) (California Environmental Protection Agency [CalEPA], 2006). Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a

common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2e), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane (CH_4) has a GWP of 25, meaning its global warming effect is 25 times greater than carbon dioxide on a molecule per molecule basis (IPCC, 2007).

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of GHGs, Earth's surface would be about 34° C cooler (CalEPA, 2006). However, it is believed that emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. The following discusses the primary GHGs of concern.

Carbon Dioxide. The global carbon cycle is made up of large carbon flows and reservoirs. Billions of tons of carbon in the form of CO_2 are absorbed by oceans and living biomass (i.e., sinks) and are emitted to the atmosphere annually through natural processes (i.e., sources). When in equilibrium, carbon fluxes among these various reservoirs are roughly balanced (United States Environmental Protection Agency [U.S. EPA], April 2014). CO_2 was the first GHG demonstrated to be increasing in atmospheric concentration, with the first conclusive measurements being made in the second half of the 20th century. Concentrations of CO_2 in the atmosphere have risen approximately 40 percent since the industrial revolution. The global atmospheric concentration of CO_2 has increased from a pre-industrial value of about 280 parts per million (ppm) to 391 ppm in 2011 (IPCC, 2007; Oceanic and Atmospheric Administration [NOAA], 2010). The average annual CO_2 concentration growth rate was larger between 1995 and 2005 (average: 1.9 ppm per year) than it has been since the beginning of continuous direct atmospheric measurements (1960–2005 average: 1.4 ppm per year), although there is year-to-year variability in growth rates (NOAA, 2014). Currently, CO_2 represents an estimated 74 percent of total GHG emissions (IPCC, 2007). The largest source of CO_2 emissions, and of overall GHG emissions, is fossil fuel combustion.

Methane. Methane (CH_4) is an effective absorber of radiation, though its atmospheric concentration is less than that of CO_2 and its lifetime in the atmosphere is limited to 10 to 12 years. It has a GWP approximately 25 times that of CO_2. Over the last 250 years, the concentration of CH_4 in the atmosphere has increased by 148 percent (IPCC, 2007), although emissions have declined from 1990 levels. Anthropogenic sources of CH_4 include enteric fermentation associated with domestic livestock, landfills, natural gas and petroleum systems, agricultural activities, coal mining, wastewater treatment, stationary and mobile combustion, and certain industrial processes (U.S. EPA, 2014).

Nitrous Oxide. Concentrations of nitrous oxide (N_2O) began to rise at the beginning of the industrial revolution and continue to increase at a relatively uniform growth rate (NOAA, 2014). N2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizers that contain nitrogen, fossil fuel combustion, and other chemical processes. Use of these fertilizers has increased over the last century. Agricultural soil management and mobile source fossil fuel combustion are the major sources of N_2O emissions. The GWP of nitrous oxide is approximately 298 times that of CO2 (IPCC, 2007).

Fluorinated Gases (HFCS, PFCS and SF_6). Fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfurhexafluoride (SF_6), are powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are used as substitutes for ozone-depleting substances such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and halons, which have been regulated since the mid-1980s because of their ozone-destroying potential and are phased out under the Montreal Protocol (1987) and Clean Air Act Amendments of 1990. Electrical transmission and distribution systems account for most SF_6 emissions, while PFC emissions result from semiconductor manufacturing and as a by-product of primary aluminum production. Fluorinated gases are typically emitted in smaller quantities than CO_2, CH_4, and N_2O, but these compounds have much higher GWPs. SF_6 is the most potent GHG the IPCC has evaluated.

Greenhouse Gas Emissions Inventory. Worldwide anthropogenic emissions of GHGs were approximately 46,000 million metric tons (MMT, or gigatonne) CO_2e in 2010 (IPCC, 2014). CO_2 emissions from fossil fuel combustion and industrial processes contributed about 65 percent of total emissions in 2010. Of anthropogenic GHGs, CO_2 was the most abundant, accounting for 76 percent of total 2010 emissions. Methane emissions accounted for 16 percent of the 2010 total, while nitrous oxide and fluorinated gases account for 6 and 2 percent respectively (IPCC, 2014).

Total U.S. GHG emissions were 6,525.6 MMT CO_2e in 2012 (U.S. EPA, 2014). Total U.S. emissions have increased by 4.7 percent since 1990; emissions decreased by 3.4 percent from 2011 to 2012 (U.S. EPA, 2014). The decrease from 2011 to 2012 was due to a reduction in the carbon intensity of fuels consumed to generate electricity due to a decrease in coal consumption, with increased natural gas consumption. Additionally, relatively mild winter conditions, especially in regions of the United States where electricity is important for heating, resulted in an overall decrease in electricity demand in most sectors. Since 1990, U.S. emissions have increased at an average annual rate of 0.2 percent. In 2012, the transportation and industrial end-use sectors accounted for 28.2 percent and 27.9 percent of CO_2 emissions (with electricity-related emissions distributed), respectively. Meanwhile, the residential and commercial end-use sectors accounted for 16.3 percent and 16.4 percent of CO_2 emissions, respectively (U.S. EPA, 2014).

Based upon the California Air Resources Board (CARB) California Greenhouse Gas Inventory for 2000-2012 (CARB, 2014), California produced 459 MMT CO_2e in 2012. The major source of GHG in California is transportation, contributing 36 percent of the state's total GHG emissions. Electric power is the second largest source, contributing 21 percent of the state's GHG emissions (CARB, 2014). The industrial sector accounted for approximately 19 percent of the total emissions. California emissions are due in part to its large size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. CARB has projected statewide unregulated GHG emissions for the year 2020 will be 507 MMT CO_2e (CARB, August 2013). These projections represent the emissions that would be expected to occur in the absence of any GHG reduction actions.

Potential Effects of Climate Change. Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or

above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Long-term trends have found that each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade from 2000 through 2010 has been the warmest. The global combined land and ocean temperature data show an increase of about 0.89°C (0.69°C–1.08°C) over the period 1901–2012 and about 0.72°C (0.49°C–0.89°C) over the period 1951–2012 when described by a linear trend. Several independently analyzed data records of global and regional Land-Surface Air Temperature (LSAT) obtained from station observations are in agreement that LSAT as well as sea surface temperatures have increased. In addition to these findings, there are identifiable signs that global warming is currently taking place, including substantial ice loss in the Arctic over the past two decades (IPCC, 2013).

According to the CalEPA's *2010 Climate Action Team Biennial Report*, potential impacts of climate change in California may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CalEPA, 2010). Below is a summary of some of the potential effects that could be experienced in California as a result of climate change.

Sea Level Rise. According to The Impacts of Sea-Level Rise on the California Coast, prepared by the California Climate Change Center (CCCC, 2009), climate change has the potential to induce substantial sea level rise in the coming century. The rising sea level increases the likelihood and risk of flooding. Sea levels are rising faster now than in the previous two millennia, and the rise is expected to accelerate, even with robust GHG emission control measures. The most recent IPCC report (2013) predicts a mean sea–level rise of 11-38 inches by 2100. This prediction is more than 50 percent higher than earlier projections of 7-23 inches, when comparing the same emissions scenarios and time periods. The previous IPCC report (2007) identified a sea level rise on the California coast over the past century of approximately eight inches. Based on the results of various climate change models, sea level rise is expected to continue. The California Climate Adaptation Strategy (2009) estimates a sea level rise of up to 55 inches by the end of this century.

Air Quality. Higher temperatures, which are conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thereby ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state (California Energy Commission [CEC], 2009).

Water Supply. Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future water supplies in California. However, the average early spring snowpack in the Sierra Nevada decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of

snowpack storage. During the same period, sea level rose eight inches along California's coast. California's temperature has risen 1°F, mostly at night and during the winter, with higher elevations experiencing the highest increase. Many Southern California cities have experienced their lowest recorded annual precipitation twice within the past decade. In a span of only two years, Los Angeles experienced both its driest and wettest years on record (California Department of Water Resources [DWR], 2008; CCCC, 2009).

This uncertainty complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The Sierra snowpack provides the majority of California's water supply by accumulating snow during the state's wet winters and releasing it slowly during the state's dry springs and summers. Based upon historical data and modeling DWR projects that the Sierra snowpack will experience a 25 to 40 percent reduction from its historic average by 2050. Climate change is also anticipated to bring warmer storms that result in less snowfall at lower elevations, reducing the total snowpack (DWR, 2008).

Hydrology. As discussed above, climate change could potentially affect: the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. The rate of increase of global mean sea levels over the 2001-2010 decade, as observed by satellites, ocean buoys and land gauges, was approximately 3.2 mm per year, which is double the observed 20th century trend of 1.6 mm per year (World Meteorological Organization [WMO], 2013). As a result, sea levels averaged over the last decade were about 8 inches higher than those of 1880 (WMO, 2013). Sea level rise may be a product of climate change through two main processes: expansion of sea water as the oceans warm and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply due to salt water intrusion. Increased CO_2 emissions can cause oceans to acidify due to the carbonic acid it forms. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture. California has a $30 billion annual agricultural industry that produces half of the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater air pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (CCCC, 2006).

Ecosystems and Wildlife. Climate change and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists project that the average global surface temperature could rise by 1.0-4.5°F (0.6-2.5°C) in the next 50 years, and 2.2-10°F (1.4-5.8°C) in the next century, with substantial regional variation. Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes, such as carbon cycling and storage (Parmesan, 2004).

According to the Center for Ocean Solutions, potential impacts from sea level rise on coastal communities, such as those in Long Beach, include: coastal erosion, coastal inundation, the intrusion of salt water into fresh water, and increased frequency and intensity of storms and waves. Unlike flooding events that can be short lived, erosion can cause greater and potentially permanent damage. Coastal erosion will increase as global sea levels continue to rise. Higher sea levels will allow waves and tides to travel farther inland, exposing beaches, cliffs and coastal dunes to more persistent erosion forces. Erosion is not a new issue in California but rising sea levels threaten to increase the severity and frequency of erosion damage to coastal infrastructure and property.

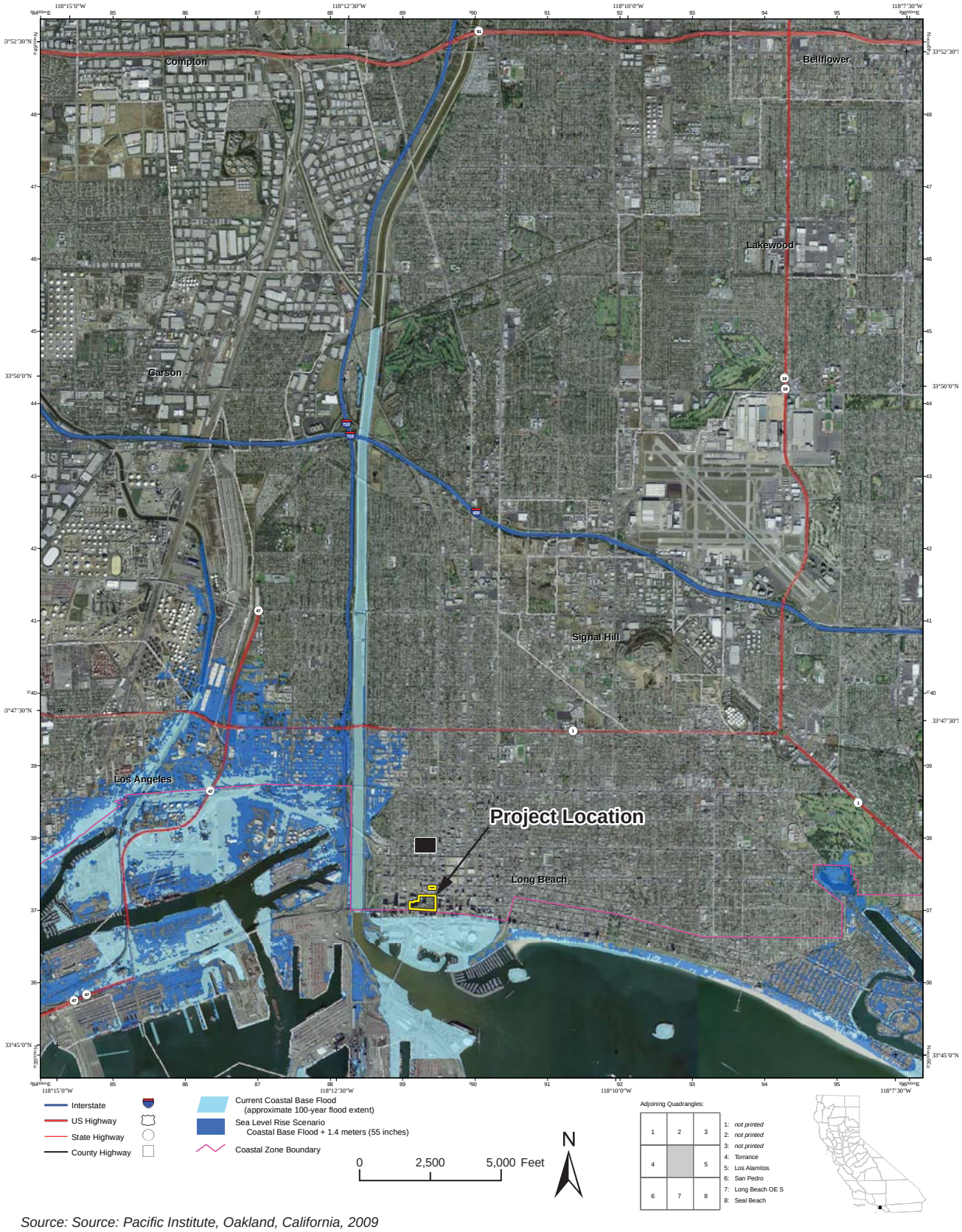
Projected sea level rise in Long Beach is depicted in Figure 4.4-1. This figures show an approximate 4.6-foot (1.4-meter) sea level rise combined with a 100-year flood in 2100.

b. Regulatory Setting. The following regulations address both climate change and GHG emissions.

International Regulations. The United States is, and has been, a participant in the United Nations Framework Convention on Climate Change (UNFCCC) since it was produced in 1992. The UNFCCC is an international environmental treaty with the objective of, "stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." This is generally understood to be achieved by stabilizing global GHG concentrations between 350 and 400 ppm, in order to limit the global average temperature increases between 2 and 2.4°C above pre-industrial levels (IPCC, 2007). The UNFCCC itself does not set limits on GHG emissions for individual countries or enforcement mechanisms. Instead, the treaty provides for updates, called "protocols," that would identify mandatory emissions limits.

Five years later, the UNFCCC brought nations together again to draft the *Kyoto Protocol* (1997). The Kyoto Protocol established commitments for industrialized nations to reduce their collective emissions of six GHGs (CO_2, CH_4, N_2O, SF_6, HFCs, and PFCs) to 5.2 percent below 1990 levels by 2012. The United States is a signatory of the Kyoto Protocol, but Congress has not ratified it and the United States has not bound itself to the Protocol's commitments (UNFCCC, 2007). The first commitment period of the Kyoto Protocol ended in 2012. Governments, including 38 industrialized countries, agreed to a second commitment period of the Kyoto Protocol beginning January 1, 2013 and ending either on December 31, 2017 or December 31, 2020, to be decided by the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol at its seventeenth session (UNFCCC, 2011).

In Durban (17th session of the Conference of the Parties in Durban, South Africa, December 2011), governments decided to adopt a universal legal agreement on climate change as soon as possible, but not later than 2015. Work will begin on this immediately under a new group called the Ad Hoc Working Group on the Durban Platform for Enhanced Action. Progress was also made regarding the creation of a Green Climate Fund (GCF) for which a management framework was adopted (UNFCCC, 2011).



Source: Source: Pacific Institute, Oakland, California, 2009

California Flood Risk:
Sea Level Rise - Long Beach

Figure 4.4-1

Federal Regulations. The United States Supreme Court in Massachusetts et al. v. Environmental Protection Agency et al. ([2007] 549 U.S. 05-1120) held that the U.S. EPA has the authority to regulate motor-vehicle GHG emissions under the federal Clean Air Act.

The U.S. EPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines, and requires annual reporting of emissions. The first annual reports for these sources were due in March 2011.

On May 13, 2010, the U.S. EPA issued a Final Rule that took effect on January 2, 2011, setting a threshold of 75,000 tons CO_2e per year for GHG emissions. New and existing industrial facilities that meet or exceed that threshold will require a permit after that date. On November 10, 2010, the U.S. EPA published the "PSD and Title V Permitting Guidance for Greenhouse Gases." The U.S. EPA's guidance document is directed at state agencies responsible for air pollution permits under the Federal Clean Air Act to help them understand how to implement GHG reduction requirements while mitigating costs for industry. It is expected that most states will use the U.S. EPA's new guidelines when processing new air pollution permits for power plants, oil refineries, cement manufacturing, and other large point sources of pollution.

On January 2, 2011, the U.S. EPA implemented the first phase of the Tailoring Rule for GHG emissions Title V Permitting. Under the first phase of the Tailoring Rule, all new sources of emissions are subject to GHG Title V permitting if they are otherwise subject to Title V for another air pollutant and they emit at least 75,000 tons CO_2e per year. Under Phase 1, no sources were required to obtain a Title V permit solely due to GHG emissions. Phase 2 of the Tailoring Rule went into effect July 1, 2011. At that time new sources were subject to GHG Title V permitting if the source emits 100,000 tons CO_2e per year, or they are otherwise subject to Title V permitting for another pollutant and emit at least 75,000 tons CO_2e per year.

On July 3, 2012 the U.S. EPA issued the final rule that retains the GHG permitting thresholds that were established in Phases 1 and 2 of the GHG Tailoring Rule. These emission thresholds determine when Clean Air Act permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

California Regulations. CARB is responsible for the coordination and oversight of State and local air pollution control programs in California. California has a numerous regulations aimed at reducing the state's GHG emissions. These initiatives are summarized below.

Assembly Bill (AB) 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, U.S. EPA granted the waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" will cover 2017 to 2025. Fleet average emission standards would reach 22 percent reduction from 2009 levels by 2012 and 30 percent by 2016. The Advanced Clean Cars program coordinates the goals of the Low Emissions Vehicles (LEV), Zero Emissions

Vehicles (ZEV), and Clean Fuels Outlet programs and would provide major reductions in GHG emissions. By 2025, when the rules will be fully implemented, new automobiles will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions from their model year 2016 levels (CARB, 2011).

In 2005, Executive Order (EO) S-3-05 established statewide GHG emissions reduction targets. EO S-3-05 provides that by 2010, emissions shall be reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent below 1990 levels (CalEPA, 2006). In response to EO S-3-05, CalEPA created the Climate Action Team (CAT), which in March 2006 published the Climate Action Team Report (the "2006 CAT Report") (CalEPA, 2006). The 2006 CAT Report identified a recommended list of strategies that the state could pursue to reduce GHG emissions. These are strategies that could be implemented by various state agencies to ensure that the emission reduction targets in EO S-3-05 are met and can be met with existing authority of the state agencies. The strategies include the reduction of passenger and light duty truck emissions, the reduction of idling times for diesel trucks, an overhaul of shipping technology/infrastructure, increased use of alternative fuels, increased recycling, and landfill methane capture. In April 2015 Governor Brown issued EO B-30-15, calling for a new target of 40 percent below 1990 levels by 2030.

California's major initiative for reducing GHG emissions is outlined in Assembly Bill 32 (AB 32), the "California Global Warming Solutions Act of 2006," signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 (essentially a 15 percent reduction below 2005 emission levels; the same requirement as under S-3-05), and requires CARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions.

After completing a comprehensive review and update process, CARB approved a 1990 statewide GHG level and 2020 limit of 427 MMT CO_2e. The Scoping Plan was approved by CARB on December 11, 2008, and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted over the last five years. Implementation activities are ongoing and CARB is currently the process of updating the Scoping Plan.

In May 2014, CARB approved the first update to the AB 32 Scoping Plan. The 2013 Scoping Plan update defines CARB's climate change priorities for the next five years and sets the groundwork to reach post-2020 goals set forth in EO S-3-05. The update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluates how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use (CARB, 2014).

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Resources Agency (Resources Agency) adopted amendments to the *CEQA Guidelines* for the feasible mitigation of GHG emissions or the effects of GHG emissions.

The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts.

CARB Resolution 07-54 establishes 25,000 metric tons (MT) of GHG emissions as the threshold for identifying the largest stationary emission sources in California for purposes of requiring the annual reporting of emissions. This threshold is just over 0.005 percent of California's total inventory of GHG emissions for 2004.

Senate Bill (SB) 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from vehicles for 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPO) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the Regional Transportation Plan (RTP). On September 23, 2010, CARB adopted final regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. The Southern California Association of Governments (SCAG) was assigned targets of an 8 percent reduction in GHGs from transportation sources by 2020 and a 13 percent reduction in GHGs from transportation sources by 2035. In the SCAG region, SB 375 also provides the option for the coordinated development of subregional plans by the subregional councils of governments and the county transportation commissions to meet SB 375 requirements.

In April 2011, Governor Brown signed SB 2X requiring California to generate 33 percent of its electricity from renewable energy by 2020.

For more information on the Senate and Assembly Bills, Executive Orders, and reports discussed above, and to view reports and research referenced above, please refer to the following websites: www.climatechange.ca.gov and www.arb.ca.gov/cc/cc.htm.

California Environmental Quality Act. Pursuant to the requirements of SB 97, the Resources Agency has adopted amendments to the *CEQA Guidelines* for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted CEQA Guidelines provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. To date, the South Coast Air Quality Management District (SCAQMD), the Bay Area Air Quality Management District (BAAQMD), the San Luis Obispo Air Pollution Control District (SLOAPCD), and the San Joaquin Air Pollution Control District (SJVAPCD) have adopted quantitative significance thresholds for GHGs.

Local Regulations. In February 2010, the Long Beach City Council adopted the Long Beach Sustainable City Action Plan, which includes initiatives, goals, and actions to reduce the City's GHG emissions. In October 2011, the Port of Long Beach developed the Greenhouse Gas Emissions Reduction Mitigation Grant Program (GHG Grant Program) to provide grant funds for projects that will reduce, avoid or capture GHG emissions. Projects eligible for funding from the program include energy efficiency, transportation, renewable energy and landscaping projects. The City of Long Beach has successfully registered its GHG emissions inventory with the California Climate Action Registry, earning the distinction of Climate Action Leader. The

City is now publicly and voluntarily reporting its 2007 GHG emissions under the California Registry's program.

4.4.2 Previous Environmental Review

The Long Beach Downtown Plan EIR (the "Downtown Plan EIR") determined that construction activities associated with full buildout of the Downtown Plan would result in the generation of GHG emissions that would cause a significant and unavoidable impact. The project would contribute to this impact, as it would generate GHG emissions through the burning of fossil fuels or other GHG emissions during construction, creating temporary emissions, including on-site stationary emissions and off-site mobile emissions. The Downtown Plan EIR estimated GHG emissions using URBEMIS 2007 Version 9.2.4. Construction and operational emissions were modeled based on default SCAQMD-recommended settings and parameters attributable to the proposed land use types and site location. The project would be subject to the mitigation measures identified and analyzed in the Downtown Plan EIR, specifically GHG-1(b), which requires that project applicant(s) obtain the most current list of construction-related GHG-reduction measures recommended by the City and/or SCAQMD and stipulate that these measures be implemented. Implementation of Downtown Plan EIR Mitigation Measure GHG-1(a), which calls for implementation of Mitigation Measure AQ-1, would require the application of Enhanced Exhaust Control Programs during construction that would reduce construction emissions of criteria air pollutants and precursors that would also reduce GHG emissions.

The Downtown Plan EIR determined that operation of uses facilitated by the Downtown Plan would also result in generation of GHG emissions that would cause a significant and unavoidable impact. Mitigation Measure GHG-2(a), which implements Mitigation Measure AQ-2, would be applicable to the project and requires implementation of ride-share programs, development of secure bicycle parking areas, exceedance of Title 24 energy efficiency standards by 20 percent, and inclusion of such measures as solar panels to achieve an additional 25 percent reduction in electricity use. Mitigation Measure GHG-2(b) requires project applicants within the Downtown Plan to implement energy efficiency, water efficiency, solid waste reduction, mobile strategies, and other measures detailed in the Downtown Plan EIR to reduce GHG emissions associated with the operation of future project development phases and supporting roadway and infrastructure improvements by an amount sufficient to achieve the goal of 6.6 MT CO_2e per service population per year. Mitigation Measure GHG-2(b) would require the project to reduce operational impacts to the extent feasible. Emissions estimates from operation may also be lower than predicted due to increased efficiency in technology since the EIR was adopted.

The project includes the demolition of the former Long Beach Courthouse. The Long Beach Courthouse Demolition Project was studied in a Draft EIR (SCH# 2014051003) that was circulated in October and November of 2014, but was not adopted. The Long Beach Courthouse Demolition Project Draft EIR determined that the demolition would not generate significant GHG emissions, and would not interfere with State, regional, or climate change plans, policies, or regulations. Impacts of the demolition project were determined to be less than significant. Nevertheless, demolition of the former Courthouse is included in this analysis of the project's GHG emissions.

4.4.3 Impact Analysis

a. Methodology and Significance Thresholds. Pursuant to the requirements of SB 97, the Resources Agency adopted amendments to the *CEQA Guidelines* for the feasible mitigation of GHG emissions or the effects of GHG emissions in March 2010. These guidelines are used in evaluating the cumulative significance of GHG emissions from the proposed project.

According to the adopted CEQA Guidelines, impacts related to GHG emissions from the proposed project would be significant if the project would:

- *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; and/or*
- *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.*

The majority of individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence to climate change; therefore, the issue of climate change typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (*CEQA Guidelines*, Section 15355).

The SCAQMD threshold, which was adopted in December 2008, considers emissions of over 10,000 MT CO_2e/year to be significant. However, the SCAQMD's threshold applies only to stationary sources and is intended to apply only when the SCAQMD is the CEQA lead agency.

In the latest guidance provided by the SCAQMD's GHG CEQA Significance Threshold Working Group in September 2010, SCAQMD has considered a tiered approach to determine the significance of residential and commercial projects. The draft-tiered approach is outlined in the meeting minutes, dated September 29, 2010.

> ***Tier 1*** *- If the project is exempt from further environmental analysis under existing statutory or categorical exemptions, there is a presumption of less than significant impacts with respect to climate change. If not, then the Tier 2 threshold should be considered.*
>
> ***Tier 2*** *- Consists of determining whether or not the project is consistent with a GHG reduction plan that may be part of a local general plan, for example. The concept embodied in this tier is equivalent to the existing concept of consistency in CEQA Guidelines section 15064(h)(3), 15125(d) or 15152(a). Under this Tier, if the proposed project is consistent with the qualifying local GHG reduction plan, it is not significant for GHG emissions. If there is not an adopted plan, then a Tier 3 approach would be appropriate.*
>
> ***Tier 3*** *- Establishes a screening significance threshold level to determine significance. The Working Group has provided a recommendation of 3,000 tons of CO_2e per year for commercial projects.*

Downtown Plan EIR Mitigation Measure GHG-2(b) outlines a GHG reduction plan for projects within the Plan Area and requires that projects reduce GHG emissions associated with the operation of future project development phases and supporting roadway and infrastructure improvements by an amount sufficient to achieve the goal of 6.6 MT CO_2e per service population per year. As the Downtown Plan is an adopted plan, SCAQMD's Tier 3 approach, although not formally adopted, is the appropriate threshold. Therefore, 6.6 MT CO_2e per service population per year is used to gauge the significance of the project's impact to climate change.

Although construction activity is addressed in this analysis, CAPCOA does not discuss whether any of the suggested threshold approaches (as discussed below in GHG Cumulative Significance) adequately address impacts from temporary construction activity. As stated in the CEQA and Climate Change white paper, "more study is needed to make this assessment or to develop separate thresholds for construction activity" (CAPCOA, 2008). Nevertheless, air districts such as the SCAQMD (2015) have recommended amortizing construction-related emissions over a 30-year period in conjunction with the proposed project's operational emissions. Therefore, although Mitigation Measure GHG-2(b) stipulates that the goal should be applied to GHG emissions associated with operational emissions and emissions from roadway and infrastructure improvements, this threshold has been applied to the project's combined operational and amortized construction emissions, per SCAQMD's recommendation (2015).

Study Methodology. Calculations of CO_2, CH_4, and N_2O emissions are provided to identify the magnitude of potential project effects. The analysis focuses on CO_2, CH_4, and N_2O because these make up 98.9 percent of all GHG emissions by volume (IPCC, 2007) and are the GHG emissions that the project would emit in the largest quantities. Fluorinated gases, such as HFCs, PFCs, and SF_6, were also considered for the analysis. However, the potential for future occupants of the proposed industrial structures is unknown at this time and to forecast emissions of fluorinated gases would be necessarily speculative. Emissions of all GHGs are converted into their CO_2e. Minimal amounts of other main GHGs (such as chlorofluorocarbons [CFCs]) would be emitted; however, these other GHG emissions would not substantially add to the calculated CO_2e amounts. Calculations are based on the methodologies discussed in the CAPCOA CEQA and Climate Change white paper (2008) and included the use of the California Climate Action Registry (CCAR) General Reporting Protocol (2009).

On-Site Operational Emissions. Operational emissions associated with existing land uses (including City Hall, the Main Library, Lincoln Park, Lincoln Parking Structure, and existing parking lots) and proposed on-site development were calculated using the California Emissions Estimator Model (CalEEMod) Version 2013.2.2 software program (see Appendix B for calculations). The former Courthouse was not included in existing uses because it is not currently in operation. Operational emissions from energy use (electricity and natural gas use) for the project were estimated using CalEEMod. The default values on which CalEEMod are based include the CEC-sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies. CalEEMod provides operational emissions of CO_2, N_2O and CH_4. This methodology is considered reasonable and reliable for use, as it has been subjected to peer review by numerous public and private stakeholders, and in particular by the CEC. It is also recommended by CAPCOA (2008).

Emissions associated with area sources, including consumer products, landscape maintenance, and architectural coating, were calculated in CalEEMod and utilize standard emission rates from CARB, U.S. EPA, and district supplied emission factor values (CalEEMod User Guide, 2013).

Emissions from waste generation were also calculated using CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CalEEMod User Guide, 2013). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and Southern California.

Modeling assumed compliance with Downtown Plan EIR Mitigation Measures AQ-2 and GHG-2(b) discussed in "Previous Environmental Review." Complete results from CalEEMod and assumptions can be viewed in Appendix B.

Direct Emissions from Mobile Combustion. Emissions of CO_2 and CH_4 from transportation sources for the proposed project were quantified using CalEEMod. Because CalEEMod does not calculate N_2O emissions from mobile sources, N_2O emissions were quantified using the California Climate Action Registry General Reporting Protocol (2009) direct emissions factors for mobile combustion (see Appendix C for calculations). The estimate of total daily trips associated with the proposed project was based on the Traffic Study prepared by Linscott, Law, and Greenspan, Engineers (LLG) in June 2015 and was calculated and extrapolated to derive total annual mileage in CalEEMod. Emission rates for N_2O emissions were based on the vehicle mix output generated by CalEEMod and the emission factors found in the California Climate Action Registry General Reporting Protocol.

A limitation of the quantitative analysis of emissions from mobile combustion is that emission models, such as CalEEMod, evaluate aggregate emissions, meaning that all vehicle trips and related emissions assigned to a project are assumed to be new trips and emissions generated by the project itself. Such models do not demonstrate, with respect to a regional air quality impact, what proportion of these emissions are actually "new" emissions, specifically attributable to the project in question. For most projects, the main contributor to regional air quality emissions is from motor vehicles; however, the quantity of vehicle trips appropriately characterized as "new" is usually uncertain as traffic associated with a project may be relocated trips from other locales. In other words, vehicle trips associated with the project may include trips relocated from other existing locations. Therefore, because the proportion of "new" versus relocated trips is unknown, the VMT estimate generated by CalEEMod is used as a conservative, "worst-case" estimate.

Construction Emissions. Construction of the proposed project would generate temporary GHG emissions primarily due to the operation of construction equipment and truck trips. Site preparation and grading typically generate the greatest amount of emissions due to the use of grading equipment and soil hauling. CalEEMod was used to estimate emissions associated with the construction period, based on parameters such as the duration of construction activity, area of disturbance, and anticipated equipment use during construction. Modeling assumed

compliance with SCAQMD Fugitive Dust Rule 403, SCAQMD Architectural Coating Rule 1113, and Downtown Plan EIR Mitigation Measure AQ-1(c), discussed in "Previous Environmental Review" (SCAQMD rules are described in more detail in Section 4.2, *Air Quality*). Complete results from CalEEMod and assumptions can be viewed in Appendix B.

Service Population. According to the Downtown Plan EIR, the project's service population is the number of residents accommodated by the project plus the number of jobs supported by the project. The proposed project would accommodate up to 780 new residential units within Long Beach. The City has approximately 2.82 persons per household (California Department of Finance, 2014). Development of the proposed project would therefore accommodate an estimated 2,200 residents (780 dwelling units x 2.82 people/dwelling unit). In addition, the project's commercial and institutional components would support jobs. As shown in Table 4.4-1, the project would support approximately 1,787 employees. Therefore, the total service population for the proposed project would be 3,987 persons.

Table 4.4-1
Employees Supported by Proposed Project

Land Use	Area (sf)	Area (acres)	Employees per Acre	Total Employees
Hotel	290,400	6.67	51.91	346
Port Building[1]	240,000	--	--	432
City Hall[1]	270,000	--	--	899
Library[2]	92,000	--	--	91
Restaurant[3]	8,000	0.18	25.76	5
Retail	32,000	0.73	18.86	14
			Total[4]	1,787

Source: Table C-1, Range of Employment Densities (Employees Per Acre) by County (Southern California Association of Governments (SCAG), Employment Density Study Summary Report, October 31, 2001). .
1. Anticipated employee count for City Hall and Port Building; Source: Amy Bodek, City of Long Beach, personal communication, July 2015.
2. Employee count from existing Main Library; Source: Stephanie Kemp, City of Long Beach, personal communication, July 2015.
3. Employee rate for "Other Retail/Services" in SCAG Table C-1 was used, as "Restaurant" is not listed.
4. Total employees rounded up, as partial employees are not possible.

Project Impacts and Mitigation Measures.

Threshold	*Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*

Impact GHG-1 **Development associated with the proposed project would generate additional GHG emissions beyond existing conditions from construction and operational activities. The Downtown Plan EIR determined that both construction and operational GHG emissions associated with buildout of the Downtown Plan would result in significant and unavoidable impacts. The proposed project would contribute to this impact; however, GHG emissions would not exceed the 6.6 MT CO_2e per service population per year significance threshold as required by Downtown Plan EIR Mitigation Measure AQ-2 and no additional mitigation measures would be required. Impacts would therefore be Class III, *less than significant.***

Operational emissions associated with existing land uses (including City Hall, the Main Library, Lincoln Park, Lincoln Parking Structure, and existing parking lots), as well as construction and operational emissions associated with proposed on-site development were calculated using CalEEMod. The former Courthouse was not included in existing uses because it is currently not in operation. The following summarizes the project's overall GHG emissions (see Appendix B for full CalEEMod worksheets).

Construction Emissions. The project construction schedule indicates that construction would occur in phases over approximately seven years beginning in 2016. Based on the CalEEMod results, construction activity facilitated by the proposed project would generate an estimated 16,583.8 metric tons of CO_2e (as shown in Table 4.4-2). Amortized over a 30-year period (the assumed life of the project), construction facilitated by the project would generate an estimated 552.8 metric tons of CO_2e per year.

Table 4.4-2
Estimated Construction Emissions of Greenhouse Gases

Construction Year	CO_2e (MT)
2016	2,400.0
2017	3,424.0
2018	2,819.0
2019	2,251.4
2020	2,518.6
2021	2,535.6
2022	635.1
Total	**16,583.8**
Amortized over 30 years	**552.8 MT per year**

See Appendix B for calculations and for GHG emission factor assumptions. Assumed compliance with SCAQMD Fugitive Dust Rule 403, SCAQMD Architectural Coating Rule 1113, and Downtown Plan EIR Mitigation Measure AQ-1(c).
Note: Total may not add up due to rounding.

Long-Term Stationary and Mobile Source Emissions. Operational emissions associated with existing uses (City Hall, Main Library, Lincoln Park, Lincoln Parking Structure, and parking lots) and proposed on-site development were estimated using CalEEMod. The former Courthouse was not included in existing uses because it is not currently in operation. Because the proposed project would in part replace existing facilities (Civic Center, Library), Table 4.4-3 summarizes the net increase in emissions associated with operation of the proposed project (emissions from proposed on-site development minus emissions from existing development to be removed or replaced as part of the project). Net operational emissions are estimated at 10,723.5 metric tons of CO_2e per year.

Table 4.4-3
Long-Term Annual Emissions of Greenhouse Gases

Emission Source	Annual Emissions MT CO_2e
Project Emissions	
Operational	
Area	11.4
Energy	4,338.2
Solid Waste	1,803.3
Water	1,046.5
Mobile	
CH_4 and CO_2	13,178.9
N_2O	720.9
Total Operational Emissions	*21,099.2*
Existing Emissions	
Operational	
Area	<0.1
Energy	2,267.6
Solid Waste	791.7
Water	442.9
Mobile	
CH_4 and CO_2	6,562.1
N_2O	311.4
Total Existing Emissions	*10,375.7*
Net Increase in Long-Term GHG Emissions [Project – Existing]	**10,723.5**

Sources: See Appendix B for calculations and for GHG emission factor assumptions. Assumed compliance with SCAQMD Fugitive Dust Rule 403, SCAQMD Architectural Coating Rule 1113, and Downtown Plan EIR Mitigation Measures AQ-1(c), AQ-2, and GHG-2(b).
Note: Total may not add up due to rounding.

Combined Construction, Stationary and Mobile Source Emissions. Table 4.4-4 summarizes the combined emissions associated with construction and operation of the proposed project and illustrates the overall emissions per service population. Construction emissions associated with construction activity (approximately 16,583.8 metric tons of CO_2e) are amortized over 30 years (the anticipated life of the project). For the proposed project, net combined annual emissions would total 11,276.3 MT CO_2e per year. With a service population of 3,987 persons, the project's net combined annual emissions would total 2.8 MT CO_2e per service population per year, which is less than the significance threshold of 6.6 CO_2e per service population per year required by Downtown Plan EIR Mitigation Measure GHG-2(b). Therefore, impacts from GHG emissions would be less than significant.

Table 4.4-4
Combined Annual Emissions of Greenhouse Gases

Emission Source	Annual Emissions MT CO_2e
Project Emissions	
Construction	552.8
Operation	7,199.4
Mobile	13,899.8
Total Project Emissions	*21,652.0*
Total Existing Emissions	***10,375.7***
Net Increase in GHG Emissions [Project – Existing]	**11,276.3**
GHG Emissions/SP/year	**2.8 MT CO_2e/SP/year**
Exceed Threshold (6.6 MT CO_2e/SP/year)?	**No**

Sources: See Appendix B for calculations and for GHG emission factor assumptions. Assumed compliance with SCAQMD Fugitive Dust Rule 403, SCAQMD Architectural Coating Rule 1113, and Downtown Plan EIR Mitigation Measures AQ-1(c), AQ-2, and GHG-2(b).
Note: Total may not add up due to rounding.
SP = service population (3,987 persons)

Mitigation Measures. Because impacts would be less than significant with mitigation from the Downtown Plan EIR, no mitigation beyond that required in the Downtown Plan EIR is required.

Significance after Mitigation. The Downtown Plan EIR determined that both construction and operational GHG emissions associated with buildout of the Downtown Plan would result in significant and unavoidable impacts. The proposed project would contribute to this impact; however, the project's emissions would be less than the significance threshold and no additional mitigation beyond that required by the Downtown Plan EIR would be necessary. Impacts would be less than significant (Class III) without additional mitigation.

Threshold	*Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?*

Impact GHG-2 The proposed project would be consistent with the Climate Action Team GHG reduction strategies, the SCAG Sustainable Communities Strategy, and Long Beach Sustainable City Action Plan Goals. Impacts related to consistency with GHG plans and policies would therefore be Class III, *less than significant.*

The proposed project would be generally consistent with applicable regulations or plans addressing GHG reductions. As indicated above, the CAT published the Climate Action Team Report (the "2006 CAT Report") in March 2006. The CAT Report identifies a recommended list of strategies that the State could pursue to reduce climate change greenhouse gas emissions.

The CAT strategies are recommended to reduce GHG emissions at a statewide level to meet the goals of the Executive Order S-3-05. These are strategies that could be implemented by various State agencies to ensure that the Governor's targets are met and can be met with existing authority of the State agencies.

The SCAG SCS contains a number of strategies that relate to the operations of SCAG and regional land use planning. Since such strategies lie beyond the scope of individual development projects, only those strategies applicable to the proposed project are addressed.

The City of Long Beach adopted a Sustainable City Action Plan in 2010. This plan contains goals intended to support sustainable development within the City. Implementation of this plan would contribute to a reduction in the City's overall GHG emissions.

Table 4.4-5 through Table 4.4-7 illustrate that the proposed project would be consistent with the GHG reduction strategies set forth by the 2006 CAT Report, the SCAG SCS, and the Sustainable City Action Plan. Therefore, additional mitigation measures would not be required.

Table 4.4-5
Project Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	Project Consistency
California Air Resources Board	
Vehicle Climate Change Standards AB 1493 (Pavley) required the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light duty trucks. Regulations were adopted by CARB in September 2004.	**Consistent** Vehicles that travel to and from the project site on public roadways would be in compliance with CARB vehicle standards that are in effect at the time of vehicle purchase.
Diesel Anti-Idling The CARB adopted a measure to limit diesel-fueled commercial motor vehicle idling in July 2004.	**Consistent** Current State law restricts diesel truck idling to five minutes or less. Diesel trucks operating from and making deliveries to the project site are subject to this state-wide law. Construction vehicles are also subject to this regulation. The project would be required to comply with Downtown Plan EIR Mitigation Measure AQ-2, which states that all truck loading and unloading docks must be equipped with one 110/208-volt power outlet for every two-dock door. Diesel trucks are prohibited from idling more than 5 minutes and must be required to connect to the 110/208-volt power to run any auxiliary equipment. Signs outlining the idling restrictions area also required.
Hydrofluorocarbon Reduction 1) Ban retail sale of HFC in small cans. 2) Require that only low GWP refrigerants be used in new vehicular systems. 3) Adopt specifications for new commercial refrigeration. 4) Add refrigerant leak-tightness to the pass criteria for vehicular inspection and maintenance programs. 5) Enforce federal ban on releasing HFCs.	**Consistent** This strategy applies to consumer products. All applicable products would be required to comply with the regulations that are in effect at the time of manufacture.

Table 4.4-5
Project Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	Project Consistency
Alternative Fuels: Biodiesel Blends CARB would develop regulations to require the use of 1 to 4 percent biodiesel displacement of California diesel fuel.	**Consistent** Diesel vehicles such as construction vehicles that travel to and from the project site on public roadways could utilize this fuel once it is commercially available. Downtown Plan EIR Mitigation Measure GHG-1(b) would require the project to use a CARB-approved low-carbon fuel, such as biodiesel or renewable diesel for construction equipment.
Alternative Fuels: Ethanol Increased use of E-85 fuel.	**Consistent** Residents living at the project site could choose to purchase flex-fuel vehicles and utilize this fuel, which is currently available at locations in Wilmington, approximately six miles northwest of the project site. Downtown Plan EIR Mitigation Measure GHG-1(b) would require the project to use a CARB-approved low-carbon fuel, such as biodiesel or renewable diesel for construction equipment.
Heavy-Duty Vehicle Emission Reduction Measures Increased efficiency in the design of heavy duty vehicles and an education program for the heavy duty vehicle sector.	**Consistent** Heavy-duty vehicles for construction activities that travel to and from the project site on public roadways would be subject to all applicable CARB efficiency standards that are in effect at the time of vehicle manufacture. In addition, the project would be subject to Mitigation Measure AQ-1(a), which requires the use of 2010 and newer diesel haul trick and that all heavy-duty (50 horsepower [hp] or more) offroad vehicles to be used during construction must implement Enhanced Exhaust Control Practices. These practices include meeting Tier 4 emission standards and being outfitted with emissions control devices that reduce emissions by no less than what could be achieved by a Level 3 diesel emissions control strategy for a similar sized engine as defined by CARB regulations.
Achieve 50 Percent Statewide Recycling Goal Achieving the State's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48 percent has been achieved on a statewide basis. Therefore, a 2 percent additional reduction is needed.	**Consistent** According to data provided by CalRecycle, the City of Long Beach met its target disposal rates for both per resident and per employee metrics. Based on data for 2013 (the most recent year for which approved data is available), the City's per resident disposal rate was 3.9 pounds per day (ppd), half of the City's 7.6 ppd target. The City has implemented more than 40 programs designed to sustain these disposal rates.
Zero Waste – High Recycling Efforts to exceed the 50 percent goal would allow for additional reductions in climate change emissions.	**Consistent** As described above it is anticipated that the proposed project would participate in waste diversion programs. The project would also be subject to all applicable State and City requirements for solid waste reduction as they change in the future.

Table 4.4-5
Project Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	Project Consistency
Department of Forestry	
Urban Forestry A new statewide goal of planting 5 million trees in urban areas by 2020 would be achieved through the expansion of local urban forestry programs.	**Consistent** Landscaping for new structures would result in additional planted trees throughout the project site.
Department of Water Resources	
Water Use Efficiency Approximately 19 percent of all electricity, 30 percent of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce greenhouse gas emissions.	**Consistent** The new proposed structures would be required to be consistent with CalGreen standards. As such, the proposed project would be equipped with low-flow plumbing fixtures, reducing water use.
Energy Commission (CEC)	
Building Energy Efficiency Standards in Place and in Progress Public Resources Code 25402 authorizes the CEC to adopt and periodically update its building energy efficiency standards (that apply to newly constructed buildings and additions to and alterations to existing buildings).	**Consistent** The proposed project would be required to exceed Title 24 standards that are in effect at the time of development by 20 percent (Downtown Area Plan EIR Mitigation Measure AQ-2). The project would be equipped with equipment (e.g., HVAC systems), lighting fixtures, and lighting that exceed Title 24 requirements.
Appliance Energy Efficiency Standards in Place and in Progress Public Resources Code 25402 authorizes the Energy Commission to adopt and periodically update its appliance energy efficiency standards (that apply to devices and equipment using energy that are sold or offered for sale in California).	**Consistent** Under State law, appliances that are purchased for the project - both pre- and post-development – would be consistent with energy efficiency standards that are in effect at the time of manufacture.
Fuel-Efficient Replacement Tires & Inflation Programs State legislation established a statewide program to encourage the production and use of more efficient tires.	**Consistent** Residents living at the project site could purchase tires for their vehicles that comply with state programs for increased fuel efficiency.
Municipal Utility Energy Efficiency Programs/Demand Response Includes energy efficiency programs, renewable portfolio standard, combined heat and power, and transitioning away from carbon-intensive generation.	*Not applicable*, but project development would not preclude the implementation of this strategy by municipal utility providers.
Municipal Utility Renewable Portfolio Standard California's Renewable Portfolio Standard (RPS), established in 2002, requires that all load serving entities achieve a goal of 20 percent of retail electricity sales from renewable energy sources by 2017, within certain cost constraints.	*Not applicable*, but the project would not preclude implementation of this strategy by Southern California Edison.

Table 4.4-5
Project Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	Project Consistency
Municipal Utility Combined Heat and Power Cost effective reduction from fossil fuel consumption in the commercial and industrial sector through the application of on-site power production to meet both heat and electricity loads.	*Not applicable* since this strategy addresses incentives that could be provided by utility providers such as Southern California Edison and The Gas Company.
Alternative Fuels: Non-Petroleum Fuels Increasing the use of non-petroleum fuels in California's transportation sector, as recommended as recommended in the CEC's 2003 and 2005 Integrated Energy Policy Reports.	**Consistent** Residents living at the project site could choose to purchase flex-fuel vehicles and utilize this fuel, which is currently available at locations in Wilmington approximately six miles northwest of the project site.
Green Buildings Initiative Green Building Executive Order, S-20-04 (CA 2004), sets a goal of reducing energy use in public and private buildings by 20 percent by the year 2015, as compared with 2003 levels. The Executive Order and related action plan spell out specific actions state agencies are to take with state-owned and -leased buildings. The order and plan also discuss various strategies and incentives to encourage private building owners and operators to achieve the 20 percent target.	**Consistent** The proposed project would be required to exceed Title 24 standards that are in effect at the time of development by 20 percent (Downtown Area Plan EIR Mitigation Measure AQ-2). The 2013 Title 24 standards, which took effect on July 1, 2014, improve nonresidential energy efficiency by 30 percent compared to the current 2008 standards. The project would be required to exceed the 2016 Title 24 standards by 20 percent, which will take effect on January 1, 2017, if construction occurs any time after that date.

Table 4.4-5
Project Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	Project Consistency
Business, Transportation and Housing	
Smart Land Use and Intelligent Transportation Systems (ITS) Smart land use strategies encourage jobs/housing proximity, promote transit-oriented development, and encourage high-density residential/commercial development along transit corridors. ITS is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods and services. The Governor is finalizing a comprehensive 10-year strategic growth plan with the intent of developing ways to promote, through state investments, incentives and technical assistance, land use, and technology strategies that provide for a prosperous economy, social equity and a quality environment. Smart land use, demand management, ITS, and value pricing are critical elements in this plan for improving mobility and transportation efficiency. Specific strategies include: promoting jobs/housing proximity and transit-oriented development; encouraging high density residential/commercial development along transit/rail corridor; valuing and congestion pricing; implementing intelligent transportation systems, traveler information/traffic control, incident management; accelerating the development of broadband infrastructure; and comprehensive, integrated, multimodal/intermodal transportation planning.	**Consistent** The project site is accessible via existing bus transit facilities. Long Beach Transit has more than ten bus stops within 0.1 miles of the project site.
Public Utilities Commission (PUC)	
Accelerated Renewable Portfolio Standard The Governor has set a goal of achieving 33 percent renewable in the State's resource mix by 2020. The joint PUC/Energy Commission September 2005 Energy Action Plan II (EAP II) adopts the 33 percent goal.	*Not applicable*, but project development would not preclude the implementation of this strategy by energy providers.
California Solar Initiative The solar initiative includes installation of 1 million solar roofs or an equivalent 3,000 MW by 2017 on homes and businesses, increased use of solar thermal systems to offset the increasing demand for natural gas, use of advanced metering in solar applications, and creation of a funding source that can provide rebates over 10 years through a declining incentive schedule.	**Consistent** The project would be required to comply with Downtown Plan Mitigation Measure AQ-2, which requires the project to include such measures as photovoltaic cells on the rooftops to achieve a 25 percent reduction in electricity use on an average sunny day, in addition to exceeding Title 24 standards by 20 percent.

Table 4.4-6
Project Consistency with Applicable SCAG SCS Greenhouse Gas Emission Reduction Strategies

Strategy	Project Consistency
Land Use Actions and Strategies	
Encourage the use of range-limited battery electric and other alternative fueled vehicles through policies and programs, such as, but not limited to, neighborhood oriented development, complete streets, and Electric (and other alternative fuel) Vehicle Supply Equipment in public parking lots.	**Consistent** Residents living at the project site could choose to purchase flex-fuel vehicles and utilize this fuel, which is currently available at locations in Wilmington, approximately six miles northwest of the project site.
Support projects, programs, policies and regulations that encourage the development of complete communities, which includes a diversity of housing choices and educational opportunities, jobs for a variety of skills and education, recreation and culture, and a full-range of shopping, entertainment and services all within a relatively short distance.	**Consistent** The proposed project includes mixed-use buildings with residential, retail, and other commercial uses. The project also includes development of a new and relocated library and park. These uses would also be located in an urbanized area and in proximity to existing residential and commercial development. Existing public transit facilities are located within 0.1 miles of the project site. The proposed project would be consistent with efforts to provide diverse housing choices with commercial and recreational opportunities. It is assumed residents and employees would use other modes of transportation including non-auto (e.g., walking, bicycles) and public transportation.
Transportation Network Actions and Strategies	
Prioritize transportation investments to support compact infill development that includes a mix of land uses, housing options, and open/park space, where appropriate, to maximize the benefits for existing communities, especially vulnerable populations, and to minimize any negative impacts.	**Consistent** The proposed project is located in an area surrounded by existing development, and would add residential, commercial, institutional, and recreational uses. As such, the project would be infill development.
Explore and implement innovative strategies and projects that enhance mobility and air quality, including those that increase the walkability of communities and accessibility to transit via non-auto modes, including walking, bicycling, and neighborhood electric vehicles (NEVs) or other alternative fueled vehicles.	**Consistent** The proposed project is located in an urbanized area and in proximity to existing residential and commercial development. Existing public transit facilities are located within 0.1 miles of the project site. The project site would be walkable and pedestrian access to the existing transit would be available.
Collaborate with local jurisdictions to plan and develop residential and employment development around current and planned transit stations and neighborhood commercial centers.	**Consistent** The proposed project is located in an urbanized area and in proximity to existing public transit facilities. The proposed project would be consistent with efforts to support the use of public transportation.
Develop first-mile/last-mile strategies on a local level to provide an incentive for making trips by transit, bicycling, walking, or neighborhood electric vehicle or other ZEV options.	**Consistent** The proposed project is located in an urbanized area and in proximity to existing residential and commercial development. Existing public transit facilities are located near the project site. The proposed project would include pedestrian connections to the existing developed areas surrounding the site as well as access to transit.

Table 4.4-6
Project Consistency with Applicable SCAG SCS Greenhouse Gas Emission Reduction Strategies

Strategy	Project Consistency
Transportation Demand Management Actions and Strategies	
Support work-based programs that encourage emission reduction strategies and incentivize active transportation commuting or ride-share modes.	**Consistent** Downtown Plan EIR Mitigation Measure AQ-2 would require commercial development operator(s) to operate, maintain, and promote a ride-share program for employees of the various businesses. In addition, this mitigation requires the development of secure bicycle parking areas within the project site for employees and customers.
Encourage the development of telecommuting programs by employers through review and revision of policies that may discourage alternative work options.	*Not applicable*; however, occupants of the project site could telecommute as appropriate.
Clean Vehicle Technology Actions and Strategies	
Develop a Regional PEV Readiness Plan with a focus on charge port infrastructure plans to support and promote the introduction of electric and other alternative fuel vehicles in Southern California.	*Not applicable*, but project development would not preclude implementation of this strategy.

Table 4.4-7
Project Consistency with Applicable Long Beach Sustainable City Action Plan Goals

Goal	Project Consistency
Buildings and Neighborhoods	
At least 5 million square feet of privately developed LEED certified (or equivalent) green buildings by 2020	**Consistent** The proposed project is not currently designed to qualify for LEED certification. However, the project includes sustainability features that would be compatible with the general LEED certification principles such as being infill development and being located in proximity to transit stops. In addition, the proposed project would be required to exceed Title 24 standards that are in effect at the time of development by 20 percent (Downtown Area Plan EIR Mitigation Measure AQ-2). The project would be equipped with equipment (e.g. HVAC systems), lighting fixtures, and lighting that exceed Title 24 requirements. The proposed project would not conflict with the implementation of this goal.
Plant at least 10,000 trees in Long Beach by 2020	**Consistent** Landscaping for new structures and Lincoln Park would result in additional planted trees throughout the project site, thus moving the City toward this target.

Table 4.4-7
Project Consistency with Applicable
Long Beach Sustainable City Action Plan Goals

Goal	Project Consistency
50 percent of Long Beach residents work in Long Beach by 2020	**Consistent** The proposed project would provide up to 780 residential units for Long Beach residents in the Downtown Area. This would enhance local housing opportunities for Long Beach workers.
Energy	
Reduce community electricity use by 15 percent by 2020 Reduce community natural gas use by 10 percent by 2020	**Consistent** The proposed project would exceed the most recent Title 24 energy efficiency requirements by 20 percent, which would increase energy efficiency. The 2014 Title 24 standards improve nonresidential energy efficiency by 30 percent.
Facilitate the development of at least 8 Megawatts of solar energy within the community (private rooftops) by 2020.	**Consistent** The project would be required to comply with Downtown Plan Mitigation Measure AQ-2, which requires the project to include such measures as photovoltaic cells on the rooftops to achieve a 25 percent reduction in electricity use on an average sunny day, in addition to exceeding Title 24 standards by 20 percent.
Transportation	
Increase public transit ridership by 25 percent by 2016 Increase bike ridership from 1 percent to 10 percent by 2016	**Consistent** The proposed project is infill development in an area served by existing public transit lines and within 0.1 miles of multiple existing transit stops.
Annual reduction in average pounds of solid waste generated per person per day	**Consistent** According to data provided by CalRecycle, the City of Long Beach met its target disposal rates for both per resident and per employee metrics. Based on data for 2013 (the most recent year for which approved data is available), the City's per resident disposal rate was 3.9 pounds per day (ppd), half of the City's 7.6 ppd target and the City's per employee disposal rate was 11.8 ppd, less than half of the 25.1 ppd target. The City has implemented more than 40 programs designed to sustain these disposal rates. The proposed project would participate in City programs intended to continue solid waste diversion.

As indicated in Table 4.4-5 through Table 4.4-7, the proposed project would not conflict with applicable CAT strategies, SCAG'S SCS GHG emission reduction strategies, and the Long Beach Sustainable City Action Plan Goals.

Mitigation Measures. Mitigation is not required.

Significance after Mitigation. Impacts would be less than significant without mitigation.

b. Cumulative Impacts. As discussed in Section 3.0, *Environmental Setting*, cumulative development in Long Beach, including development facilitated by the proposed project, would add dwelling units and non-residential development that would generate GHGs from vehicle trips and other sources. Analyses of GHGs are cumulative in nature, as they affect the accumulation of greenhouse gases in the atmosphere. Projects falling below the impact thresholds discussed above would have a less than significant impact, both individually and cumulatively. As indicated in Impact GHG-1, GHG emissions associated with the proposed project would be less than significant and the project's contribution to cumulative impacts are therefore also cumulatively less than significant.