7. CLIMATE CHANGE

This EIR chapter addresses the climate change implications of the proposed project, both beneficial and adverse. The chapter describes the climate change issue, assesses the potential climate change impacts of the project, determines the significance of the impacts, and identifies mitigation measures warranted to reduce climate change impacts. This climate change analysis has been closely coordinated with the air quality analysis included in chapter 5 (Air Quality) of this EIR.

7.1 SETTING

7.1.1 Background

The term *climate change* is often used interchangeably with the term global warming. *Climate change* refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from a variety of causes, both natural and human induced. *Global warming* refers to an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of greenhouse gases from human activities.[1]

Gases that trap heat in the atmosphere are referred to as "greenhouse gases" (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. Over the past 200 years, GHG emissions and deforestation have caused the concentrations of heat-trapping GHGs to increase significantly in our atmosphere. These gases prevent heat from escaping to space. Since the early 1990s, scientific consensus has held that the world's population is releasing GHGs faster than the earth's natural systems can absorb them. These GHGs are released as by-products of fossil fuel combustion, waste disposal, energy use, land-use changes, and other human activities.

This release of GHGs creates a blanket around the earth that allows light to pass through but traps heat at the surface preventing its escape into space. Models show that this greenhouse effect phenomenon will lead to a two- to ten-degree Fahrenheit (F) temperature increase over the next 100 years. The Intergovernmental Panel on Climate Change (IPCC), an international group of scientists and representatives, warns that most of the warming observed over the last 50 years is attributable to human activities. The accumulation of GHGs has been implicated as a driving force for global climate change.

[1]U.S. Environmental Protection Agency (EPA) website, Climate Change, Basic Information, September 30, 2008.

There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to global warming, although there is uncertainty concerning the magnitude and rate of the warming.

Carbon dioxide (CO_2) accounts for approximately 85 percent of total human activity-generated GHG emissions. Emissions of other GHGs, such as methane (CH_4) and nitrous oxide (N_2O), have also increased due to human activities. Methane and nitrous oxide emissions account for almost 14 percent of total greenhouse gas emissions. Each of these gases, however, contributes to global warming at a different relative rate. Methane has a global warming potential 23 times that of carbon dioxide, while the global warming potential of nitrous oxide is 296 times that of the same amount of carbon monoxide. To account for these differences, estimates of greenhouse gas emissions are often described in terms of *carbon dioxide equivalents* (CO_2e).

7.1.2 Existing Conditions

The existing environmental conditions or setting, without the project, constitutes the baseline physical condition for determining whether a project's impacts are significant.

(a) Global GHG Emissions. A report of the Intergovernmental Panel on Climate Change (IPCC) predicts a global temperature increase of between 2.0 and 11.5 degrees Fahrenheit (F) (1.1 and 6.4 degrees Celsius) by the end of the 21st century under six different scenarios of emissions and carbon dioxide equivalent concentrations.[1] Sea levels are predicted to rise by 0.18 to 0.59 meters (7 to 23 inches) during this time, with an additional 3.9 to 7.8 inches possible depending upon the rate of polar ice sheets melting from increased warming. The IPCC reports that the increase in hurricane and tropical cyclone strength since 1970 can also likely be attributed to human-generated greenhouse gases.

Global GHG inventory data published in 2007 by the United Nations[2] indicated that worldwide GHG emissions of in 2004 totaled 27 billion metric tons.[3]

(b) U.S. GHG Emissions. In the U.S., energy-related activities account for three-quarters of human-generated GHG, mostly in the form of carbon dioxide emissions from burning fossil fuels. More than half the energy-related emissions come from large stationary sources such as power plants, while about a third comes from transportation. Industrial processes (such as the production of cement, steel, and aluminum), agriculture, forestry, other land use, and waste management are also important U.S. sources of GHG emissions.[4]

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[1]IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.

[2]Combined total of Annex I and Non-Annex I Country CO_2eq emissions. United Nations Framework Convention on Climate Change (UNFCCC), 2007, *Greenhouse Gas Inventory Data*. Information available at http://unfcc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3814.php and http://maindb.unfccc.int/library/view_pdf.pl?url=http://unfccc.int/resource/docs/2005/sbi/eng/18a02.pdf.

[3]A metric ton is equivalent to approximately 1.1 tons.

[4]EPA website.

The latest EPA-published national inventory of U.S. GHG emissions shows that in 2005 the U.S. emitted over 7.2 billon metric tons of GHG. (A million metric tons of CO_2e is roughly equal to the annual GHG emissions of an average U.S. power plant.)

(c) State GHG Emissions. According to the California Air Resources Board (CARB) emissions inventory estimates, California emitted approximately 480 million metric tons of GHGs in 2004.[1] This large number is due primarily to the sheer size of California compared to other States. By contrast, California has the fourth lowest per-capita GHG emission rate from fossil fuel combustion in the country, due to the success of its energy efficiency and renewable energy programs and commitments that have lowered the State's GHG emissions rate of growth by more than half of what it would have been otherwise.[2]

The California EPA Climate Action Team stated in its March 2006 report that the composition of gross climate change pollutant emissions in California in 2002 (expressed in terms of CO_2e) was as follows:

- Carbon dioxide (CO_2) accounted for 83.3 percent;
- Methane (CH_4) accounted for 6.4 percent;
- Nitrous oxide (N_2O) accounted for 6.8 percent; and
- Fluorinated gases (HFCs, PFC, and SF_6) accounted for 3.5 percent.[3]

The CARB is responsible for developing the California Greenhouse Gas Emission Inventory. This inventory estimates the amount of GHGs emitted to and removed from the atmosphere by human activities within the State of California and supports the AB 32 Climate Change Program. CARB's current GHG emission inventory covers the year 1990-2004 and is based on fuel use, equipment activity, industrial processes, and other relevant data (e.g., housing, landfill activity, agricultural lands, etc.). The emission inventory estimates are based on the actual amount of all fuels combusted in the State, which accounts for over 85 percent of the GHG emissions within California.

The CARB estimates that transportation was the source of approximately 38 percent of the State's GHG emissions in 2004, followed by electricity generation (both in-State and out-of-State) at 23 percent, and industrial sources at 20 percent. The remaining sources of GHG emissions in 2004 were residential and commercial activities at 9 percent, agriculture at 6

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[1]California Air Resources Board (CARB), Greenhouse Gas Inventory Data - 1990 to 2004. http://www.arb.ca.gov/cc/inventory/data/data.htm. Viewed November 2008.

[2]California Energy Commission (CEC). Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 - Final Staff Report, publication # CEC-600-2006-013-SF, Sacramento, CA, December 22, 2006; and January 23, 2007 update to that report.

[3]California Environmental Protection Agency. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. March 2006.

percent, high global warming potential gases at 3 percent, and recycling and waste at 1 percent.[1]

Potential Future Emissions. CARB staff has also projected anticipated 2020 unregulated GHG emissions--i.e., the emissions that would be expected to occur statewide in the absence of any GHG reduction actions. CARB staff estimates the statewide 2020 unregulated GHG emissions would be 596 million metric tons (of CO_2e).

GHG emissions in 2020 from the transportation and electricity sectors as a whole are expected by CARB staff to increase, but remain at approximately 38 percent and 23 percent of total GHG (CO_2e) emissions, respectively. The industrial sector consists of large stationary sources of GHG emissions and the percentage of the total 2020 emissions from that sector is projected by CARB staff to be 17 percent of total GHG emissions. The remaining sources of GHG emissions anticipated in 2020 are high global warming potential gases at 8 percent, residential and commercial activities at 8 percent, agriculture at 5 percent, and recycling and waste at 1 percent.[2]

(d) Bay Area Emissions. The Bay Area Air Quality Management District (BAAQMD) established a climate protection program in 2005 to acknowledge the link between climate change and air quality. The Air District regularly prepares inventories of criteria and toxic air pollutants to support planning, regulatory and other programs. The most recent GHG emissions inventory estimates posted by the BAAQMD for the San Francisco Bay Area are for base year 2007.[3]

In 2007, an estimated 102.6 million metric tons of GHGs were emitted by the San Francisco Bay Area. Fossil fuel consumption in the transportation sector was the single largest source of these estimated GHG emissions. The transportation sector, including on-road motor vehicles, locomotives, shops and boats, and aircraft, contributed over 40 percent of the estimated GHG emissions. The industrial and commercial sector (excluding electricity and agriculture) was the second largest contributor with 34 percent of total GHG emissions. Energy production activities such as electricity generation and co-generation were the third largest contributor accounting for approximately 15 percent of the total GHG emissions. Off-road equipment such as construction, industrial, commercial, and lawn and garden equipment contributed 3 percent of GHG emissions.

Potential Statewide Impacts. Potential impacts of global warming in California may include, but are not limited to, loss in snowpack, sea level rise, more extreme heat days per year, more high

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[1]California Air Resources Board (CARB), http://www.climatechange.ca.gov/inventory/indesx.html. September 2008.

[2]California Air Resources Board (CARB). http://www.arb.ca.gov/cc/inventory/data/forecast.htm. September 2008.

[3]Bay Area Air Quality Management District. *Source Inventory of Bay Area Greenhouse Gas Emissions.* December 2008.

ozone days, more large forest fires, and more drought years.[1] Secondary effects are likely to include impacts to agriculture, changes in disease vectors, changes in habitat and biodiversity, and contribution to global rise in sea level.

The Sierra snowpack, an important source of water supply for the state, has shrunk 10 percent in the last 100 years. It is expected to continue to decrease by up to 25 percent by 2050.

(e) Sea Level Rise. World-wide climate changes are causing sea levels in California coastal areas to rise. About 8 inches of increase have been recorded at the Golden Gate Bridge over the past 100 years, threatening low coastal areas in the Bay region with inundation and serious damage from storms.[2] Predicted long-term climate change (increased temperatures) is expected to continue to cause rising sea levels along the California coastline, particularly in the San Francisco and the San Joaquin Delta areas, due to ocean expansion. According to a 2008 California Department of Water Resources report, recent peer-reviewed studies estimate a rise of between 7 to 55 inches by 2100 along California's coast.[3] A recent report by the Pacific Institute predicts that a 1.4-meter (55-inch) sea level rise along California's coast will put 480,000 people at risk of a 100-year flood event, given today's population. This amount of sea level rise is also expected to accelerate erosion, resulting in a loss of 41 square miles (over 26,000 acres) of California's coast by 2100.[4]

According to sea level rise maps produced by the San Francisco Bay Conservation and Development Commission (BCDC), portions of the project site (near San Pablo Bay and Refugio Creek) may be vulnerable to both an approximately 16-inch sea level rise in San Pablo Bay by mid-century and an approximately 55-inch sea level rise in the bay by end-of-century.[5]

7.2 PERTINENT PLANS AND POLICIES

CEQA requires an EIR to identify the plan and policy setting within which the project is proposed and discuss any inconsistencies between the proposed project and these applicable plans and policies (CEQA Guidelines section 15125[d]). CEQA also indicates that this plan and policy

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[1]California Air Resources Board (CARB), 2006. Climate Change website (http://www.arb.ca.gov/cc/120106workshop/intropres12106.pdf), viewed December 4, 2007; and http://www.arb.ca.gov/cc/factsheets/ccbackground.pdf, viewed February 17, 2009.

[2]CARB Draft Scoping Plan, page 6.

[3]California Department of Water Resources, Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water, October 2008, page 6. (http://www.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf)

[4]California Climate Change Center, The Impacts of Sea-Level Rise on the California Coast, prepared by Matthew Heberger, Heather Cooley, Pablo Herrera, Peter H. Gleick, and Eli Moore of the Pacific Institute, March 2009, page xi. (http://www.pacinst.org/reports/sea_level_rise/report.pdf)

[5]BCDC has produced a three-map series to illustrate two sea level rise scenarios. The series depicts (1) a mid-century sea level rise of 16 inches, (2) an end-of-century sea level rise of 55 inches, and (3) a composite of both 16 and 55 inches. The three San Pablo Bay/Carquinez Strait maps, which include the project site, are posted on-line (http://www.bcdc.ca.gov/planning/climate_change/maps/16_55/SPbay_Carqz.pdf, viewed February 16, 2010).

consistency discussion should be limited to the context of evaluation and review of environmental impacts (CEQA Guidelines section 15124[b]).

Agencies at the international, national, statewide, and local levels are considering or have adopted strategies to control emissions of gases that contribute to global climate change. Adopted and anticipated plans, policies, regulations and programs pertinent to climate change and consideration of the climate change impacts of the proposed project are described below.

7.2.1 International Greenhouse Gas Regulations

In 1988, the United Nations established the Intergovernmental Panel on Climate Change to evaluate the impacts to global warming and to develop strategies that nations could implement to curtail global climate change. The U.S. joined several countries around the world to sign the United Nation's Framework Convention on Climate Change (UNFCCC) agreement (Kyoto Protocol) in November 1998. However, the U.S.'s signing of the Kyoto Protocol was never ratified by the United States Congress. In 2001, the Bush Administration disengaged from the Kyoto Protocol in favor of studying potential domestic actions that might be made towards the reduction of GHG in the U.S. The Kyoto Protocol is set to expire in 2012.

In December 2009, representatives from 170 countries convened to prepare an updated international treaty for GHG emission reductions, known as the Copenhagen Protocol. The Copenhagen Protocol seeks to establish a two degree limit (Celsius) on global warming by 2050. However, this agreement is not considered legally binding on the nations that have executed it and therefore has no effect on any state or local regulations.

7.2.2 Federal Greenhouse Gas Regulations

(a) Supreme Court Ruling. The U.S. Environmental Protection Agency (EPA) is the Federal agency responsible for implementing the Clean Air Act (CAA). The U.S. Supreme Court ruled in its decision in Massachusetts et al. v. Environmental Protection Agency et al. ([2007] 549 U.S. 05-1120), issued on April 2, 2007, that carbon dioxide (CO_2) is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs.

(b) Mandatory Greenhouse Gas Reporting Rule. In response to the mounting issue of climate change, EPA has taken actions to regulate, monitor, and potentially reduce GHG emissions. On September 22, 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States. In general, this national reporting requirement will provide EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO_2 per year. This publically available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial greenhouse gases along with vehicle and engine manufacturers will report at the corporate level. An estimated 85% of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this final rule.

(c) Endangerment Finding. On April 23, 2009, EPA published their "Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CCA" (Endangerment Finding) in the Federal Register. The Endangerment Finding is based on Section 202(a) of the CAA, which states that the Administrator (of EPA) should regulate and develop standards for "emission[s] of air pollution from any class of classes of new motor vehicles or new motor

vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." The proposed rule addresses Section 202(a) in two distinct findings. The first addresses whether or not the concentrations of the six key GHGs (i.e., carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], hydrofluorocarbons [HFCs], perflurorocarbons [PFCs], and sulfur hexafluoride [SF_6]) in the atmosphere threaten the public health and welfare of current and future generations. The second addresses whether or not the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs and therefore the threat of climate change.

The Administrator proposed the finding that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CCA. The evidence supporting this finding consists of human activity resulting in "high atmospheric levels" of GHG emissions, which are very likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wild fires, droughts, sea level rise, higher intensity storms) are a threat to the public health and welfare. Therefore, GHGs were found to endanger the public health and welfare of current and future generations.

The Administrator also proposed the finding that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. The proposed finding cites that in 2006, motor vehicles were the second largest contributor to domestic GHG emissions (24 percent of total) behind electricity generation. Furthermore, in 2005, the U.S. was responsible for 18 percent of global GHG emissions. Therefore, GHG emissions from motor vehicles and motor vehicle engines were found to contribute to air pollution that endangers public health and welfare.

7.2.3 State Greenhouse Gas Regulations

(a) Assembly Bill 1493 (2002). In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 required that ARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, in 2004 ARB approved amendments to the California Code of Regulations (CCR) adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1) require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons), beginning with the 2009 model year. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for the 2016 model year are approximately 37 percent lower than the limits for the first year of the regulations, the 2009 model year. For light-duty trucks with LVW of 3,751 pounds to gross vehicle weight (GVW) of 8,500 pounds, as well as medium-duty passenger vehicles, GHG emissions would be reduced approximately 24 percent between 2009 and 2016.

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against ARB to prevent enforcement of 13 CCR Sections 1900 and 1961 as amended by AB 1493 and 13 CCR 1961.1 (Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon, in Her Official Capacity as Executive Director of the California Air Resources Board, et al.). The auto-makers' suit in the U.S. District Court for the Eastern District of California, contended California's implementation of regulations that, in effect, regulate vehicle fuel economy violates various federal laws, regulations, and policies.

On December 12, 2007, the Court found that if California receives appropriate authorization from EPA (the last remaining factor in enforcing the standard), these regulations would be consistent with and have the force of federal law, thus, rejecting the automakers' claim. This authorization to implement more stringent standards in California was requested in the form of a CAA Section 209, subsection (b) waiver in 2005. Since that time, EPA failed to act on granting California authorization to implement the standards. Governor Schwarzenegger and Attorney General Edmund G. Brown filed suit against EPA for the delay. In December 2007, EPA Administrator Stephen Johnson denied California's request for the waiver to implement AB 1493. Johnson cited the need for a national approach to reducing GHG emissions, the lack of a "need to meet compelling and extraordinary conditions", and the emissions reductions that would be achieved through the Energy Independence and Security Act of 2007 as the reasoning for the denial.

The state of California filed suit against EPA for its decision to deny the CAA waiver. The recent change in presidential administration directed EPA to reexamine its position for denial of California's CAA waiver and for its past opposition to GHG emissions regulation. California received the waiver, notwithstanding the previous denial by EPA, on June 30, 2009.

(b) Senate Bills 1078 and 107 and Executive Order S-14-08. SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008 Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Energy Standard to 33 percent renewable power by 2020. Governor Schwarzenegger plans to propose legislative language that will codify the new higher standard.

(c) Executive Order S-3-05 (2005). Governor Schwarzenegger signed Executive Order S-3-05 on June 1, 2005 which proclaimed California is vulnerable to the impacts of climate change. The executive order declared increased temperatures could reduce snowpack in the Sierra Nevada Mountains, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established targets for total GHG emissions which include reducing GHG emissions to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The executive order also directed the secretary of the California Environmental Protection Agency to coordinate a multiagency effort to reduce GHG emissions to the target levels. The secretary will submit biannual reports to the governor and legislature describing progress made toward reaching the emission targets; impacts of global warming on California's resources; and mitigation and adaptation plans to combat impacts of global warming.

To comply with the executive order, the Secretary of the California Environmental Protection Agency created the California Climate Action Team which is made up of members from various

state agencies and commissions. The California Climate Action Team released its first report in March 2006 of which proposed achieving the GHG emissions targets by building on voluntary actions of California businesses and actions by local governments and communities along with continued implementation of state incentive and regulatory programs.

(d) Assembly Bill 32 (2006), California Global Warming Solutions Act. In September 2006, the governor of California signed AB 32 (Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006, which enacted Sections 38500–38599 of the California Health and Safety Code. AB 32 requires the reduction of statewide GHG emissions to 1990 levels by 2020. This equates to an approximate 15 percent reduction compared to existing statewide GHG emission levels or a 30 percent reduction from projected 2020 "business as usual" emission levels. The required reduction will be accomplished through an enforceable statewide cap on GHG emissions beginning in 2012.

To effectively implement the statewide cap on GHG emissions, AB 32 directs ARB to develop and implement regulations that reduce statewide GHG emissions generated by stationary sources. Specific actions required of ARB under AB 32 include adoption of a quantified cap on GHG emissions that represent 1990 emissions levels along with disclosing how the cap was quantified, institution of a schedule to meet the emissions cap, and development of tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions needed to meet the cap.

In addition, AB 32 states that if any regulations established under AB 1493 (2002) cannot be implemented then ARB is required to develop additional, new regulations to control GHG emissions from vehicles as part of AB 32.

(e) Senate Bill 1368 (2006). SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the California Public Utilities Commission (PUC) to establish a GHG emissions performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) was required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

(f) Senate Bill 97 (2007). SB 97, signed by governor of California in August 2007 (Chapter 185, Statutes of 2007; Public Resources Code, Sections 21083.05 and 21097), acknowledges climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Resources Agency by July 1, 2009 guidelines for mitigating GHG emissions or the effects of GHG emissions, as required by CEQA. The California Resources Agency was required to certify and adopt these guidelines by January 1, 2010. Amendments to the CEQA Guidelines pursuant to SB 97 were adopted in March 2010.

(g) Executive Order S-1-07. Governor Schwarzenegger signed Executive Order S-1-07 in 2007 which proclaimed the transportation sector as the main source of GHG emissions in California. The executive order proclaims the transportation sector accounts for over 40 percent of statewide GHG emissions. The executive order also establishes a goal to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020. In

particular, the executive order established a Low-Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by CEC on December 24, 2007) and was submitted to ARB for consideration as an "early action" item under AB 32. The ARB adopted the LCFS on April 23, 2009.

(h) California Climate Action Team Report Standards. Per Executive Order S-05-05, signed in June 2005, the State of California mandates the preparation of biennial science assessment reports on climate change impacts and adaptation options for the state. The first California Climate Action Team (CCAT) Assessment Report was produced in March 2006, followed by an updated report in 2008. A Draft 2009 Climate Action Team Report has been prepared and includes a host of implementation strategies to reduce GHG emissions. The strategies relate to water use efficiency, solid waste, transportation emissions, and green building initiatives.

(i) Senate Bill 375 (2008). SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. As part of the alignment, SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) which prescribes land use allocation in that MPO's Regional Transportation Plan (RTP). The ARB, in consultation with MPOs, is required to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. The ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned GHG emission reduction targets. If MPOs do not meet the GHG reduction targets, transportation projects located in the MPO boundaries would not be eligible for funding programmed after January 1, 2012.

This bill also extends the minimum time period for the Regional Housing Needs Allocation (RNHA) cycle from 5 years to 8 years for local governments located in an MPO that meets certain requirements. City or County land use policies (e.g., General Plans) are not required to be consistent with the RTP including associated SCSs or APSs. Qualified projects consistent with an approved SCS or APS and categorized as "transit priority projects" would receive incentives under new provisions of CEQA.

(j) Executive Order S-13-08. Governor Schwarzenegger signed Executive Order S-13-08 on November 14, 2008 which directs California to develop methods for adapting to climate change through preparation of a statewide plan. The executive order directs OPR, in cooperation with the California Resources Agency (CRA), to provide land use planning guidance related to sea level rise and other climate change impacts by May 30, 2009. The order also directs the CRA to develop a state Climate Adaptation Strategy by June 30, 2009 and to convene an independent panel to complete the first California Sea Level Rise Assessment Report. The assessment report is required to be completed by December 1, 2010 and required to include the following four items:

1. Project the relative sea level rise specific to California by taking into account issues such as coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates;

2. Identify the range of uncertainty in selected sea level rise projections;

3. Synthesize existing information on projected sea level rise impacts to state infrastructure

4. (e.g., roads, public facilities, beaches), natural areas, and coastal and marine ecosystems; and

5. Discuss future research needs relating to sea level rise in California.

(k) AB 32 Climate Change Scoping Plan. In December 2008, ARB adopted its Climate Change Scoping Plan, which contains the main strategies California will implement to achieve reduction of approximately 169 million metric tons (MMT) of CO_2e, or approximately 30% from the state's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO_2e, or almost 10%, from 2002-2004 average emissions). The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e);

- the Low-Carbon Fuel Standard (15.0 MMT CO_2e);

- energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e); and

- a renewable portfolio standard for electricity production (21.3 MMT CO_2e).

ARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the Scoping Plan does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions(meanwhile, ARB is also developing an additional protocol for community emissions). ARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The Scoping Plan states that the ultimate GHG reduction assignment to local government operations is to be determined (ARB 2008). With regard to land use planning, the Scoping Plan expects approximately 5.0 MMT CO_2e will be achieved associated with implementation of SB 375.

(l) California Attorney General's Office Strategies. The California Attorney General's Office developed a set of strategies and mitigation measures with the intent of reducing GHG emissions per the direction of AB 32. This list was last updated in January 2010. The Attorney

General's Office also provides guidance to local jurisdictions in determining climate change impacts as part of the public review process.

(m) State Green Building Standards Code (CALGreen). Adopted by the State Building Standards Commission in January 2010, CALGreen supplements the California Building Standards Code (Title 24) and will, upon taking effect on January 1, 2011, require all new buildings in the state to incorporate energy saving features. New standards include the following:

- Water efficiency: New buildings must demonstrate at least a 20 percent reduction in water use over typical baseline conditions.
- Construction waste: At least 50 percent of construction waste must be recycled, reused, or otherwise diverted from landfilling.
- Interior finishes: Interior finishes such as paints, carpet, vinyl flooring, particle board, and other similar materials must be low-pollutant emitting.
- Landscape irrigation: In nonresidential buildings, separate water meters must be provided for a building's indoor and outdoor water use. Large landscape projects must use moisture-sensing irrigation systems to limit unnecessary watering.

(n) Interim CEQA Technical Advisory, CEQA and Climate Change (June 2008). On June 18, 2008, OPR released a CEQA and Climate Change Technical Advisory[1] for interim use until amendments to the CEQA Guidelines on the analysis and mitigation of GHG emissions in CEQA documents were adopted pursuant to SB 97. The guidance provided by the Technical Advisory formed the basis for the CEQA Guidelines amendments described in (o) below.

The Technical Advisory also contains a list of examples of GHG reduction measures.[2] Measures from the list that are reflected in the project characteristics or in the mitigation measures identified in EIR chapter 5 (Air Quality) or chapter 16 (Transportation and Circulation) are listed in Table 7.2 in section 7.3.3, Impacts and Mitigation Measures, below.

(o) CEQA Guidelines. Amendments to the CEQA Guidelines, effective March 2010 and pursuant to SB 97 include a new section 15064.4 designed to assist lead agencies in determining the significance of the impacts of GHG emissions. Section 15064.4 encourages lead agencies to quantify the greenhouse gas emissions of proposed projects where possible and recommends lead agencies consider several factors in determining significance: (1) the extent to which the project may increase or reduce GHG emissions compared with the existing environment, (2) whether the emissions exceed a threshold of significance that applies to the project, and (3) the extent to which the project complies with requirements adopted to implement a statewide, regional, or local plan for reduction of GHG emissions. The amendments (section 15126.4, Consideration and Discussion of Mitigation Measures Proposed

[1]State of California Governor's Office of Planning and Research, *Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*, June 19, 2008.

[2]State of California Governor's Office of Planning and Research, *Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*, June 19, 2008, Attachment 3: Examples of GHG Reduction Measures.

to Minimize Significant Effects) also suggest that mitigation measures include (1) measures contained in an existing plan to reduce GHG emissions; (2) reductions in GHG emissions through project design, such as those contained in Appendix F to the CEQA Guidelines (Energy Conservation); (3) off-site measures, including offsets; (4) measures that sequester GHG emissions (i.e., capture at the source); and (5) in the case of the adoption of a plan--such as a general plan, long-range development plan, or plans for the reduction of greenhouse gas emissions--mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

7.2.4 Regional Greenhouse Gas Regulations

The Bay Area Air Quality Management District (BAAQMD) established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the San Francisco Bay Area Air Basin. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy all of which assist in reducing emissions of GHG and in reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

7.2.5 City of Hercules

(a) Hercules General Plan. The Hercules General Plan does not contain any policies or other provisions specifically relevant to climate change.

(b) Waterfront District Master Plan. The Waterfront District Master Plan (WDMP) does not contain any policies or other provisions specifically relevant to climate change.

However, these land use documents do contain goals and policies that encourage and allow mixed-use (residential, office, retail) development around alternative transportation modes. The proposed project would support these land use planning techniques by being physically and functionally integrated with the proposed Intermodal Transit Center (ITC) project.

7.3 IMPACTS AND MITIGATION MEASURES

The GHG emissions from any individual project, even a very large development project, would not individually generate GHG emissions sufficient to measurably influence global climate change. However, the GHG emissions from any individual project contribute to cumulative GHG emissions on a global, national, and regional scale. Consideration of the impact of a project on global climate change involves, therefore, analysis of its contribution to a cumulatively significant global impact through its GHG emissions.

7.3.1 Significance Criteria

CEQA Guidelines Section 15064.4 provides direction to lead agencies in determining the significance of impacts from GHG emissions. Section 15064.4(a) calls on lead agencies to

make a good faith effort, based on available information, to "describe, calculate, or estimate" the amount of GHG emissions resulting from a project. The lead agency has the discretion to determine, in the context of a particular project, how to quantify GHG emissions.

The following climate change impact analysis uses the significance criteria contained in the CEQA Guidelines and the thresholds of significance for GHG emissions impacts suggested by the BAAQMD CEQA Air Quality Guidelines.

(a) Significance Criteria. Significance criteria (a) and (b) below are from Appendix G of the CEQA Guidelines. Criterion (c) was added to reflect circumstances relevant to the project site, portions of which BCDC maps indicate will be affected by sea level rise caused by global climate change.

The project would be considered to have a significant climate change impact if it would:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment;

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG; or

(3) Expose people or structures to a significant risk of loss, injury or death involving flooding caused by sea level rise resulting from global climate change.

(b) BAAQMD Thresholds of Significance. Neither the CEQA statute nor the CEQA Guidelines prescribe specific thresholds of significance for determining climate change impacts for individual projects. This is left to lead agency judgment and discretion, based upon factual data and guidance from regulatory agencies and expert sources. This analysis uses the thresholds of significance suggested by the BAAQMD CEQA Air Quality Guidelines, which have been formulated to be consistent with and not impede attainment of the State's GHG emissions reduction goal of reducing GHG emissions to 1990 levels by 2020, or 80 percent below 1990 levels by 2050, as set forth in AB 32.

According to the BAAQMD CEQA Air Quality Guidelines, the threshold of significance for operational-related GHG emissions of plans, other than General Plans, is a GHG efficiency-based metric of 4.6 metric tons (MT) per service population per year.[1] If annual emissions would exceed this level, the proposed plan would result in a cumulatively considerable contribution to global climate change and a significant impact.

[1]Service population is defined as the number of residents plus the number of jobs. The BAAQMD does not have an adopted threshold of significance for construction-related GHG emissions. However, the lead agency is encouraged to incorporate best management practices (BMPs) to reduce GHG emissions during construction, as applicable. Best management practices may include, but are not limited to: using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet; using local building materials of at least 10 percent; and recycling or reusing at least 50 percent of construction waste or demolition materials.

7.3.2 Relevant Project Characteristics

The land uses proposed by the project are described in chapter 3, Project Description, and chapter 12, Land Use and Planning, of this Draft EIR. In summary, the project proposes development of:[1]

- up to 1,392 multi-family residential units (125 of which may be replaced with a 125-room hotel);
- up to 115,000 square feet of office uses, which could include commercial or conference space;
- up to 90,000 square feet of retail uses; and
- up to 134,000 square feet of "flex uses" that may be developed as residential, office (including live/work), and/or retail space, of which no more than 67,000 square feet would be retail uses. In addition, if all 134,000 square feet of flex space were developed with residential uses, the maximum number of housing units would be 134.

7.3.3 Impacts and Mitigation Measures

Project-Related and Cumulative Increase in Greenhouse Gas Emissions. Project development would result in a net increase in carbon dioxide and other greenhouse gas emissions, though not to a level considered significant under CEQA, as described below. By facilitating infill development in an urban area at locations with local and regional transit access, and by facilitating the provision of improved local and regional transit facilities, project-related vehicle trips and vehicle miles traveled would be reduced. In addition, project-facilitated new building construction and other improvements would be required to meet California Energy Efficiency Standards for Residential and Nonresidential Buildings, helping to reduce associated future energy demand and associated project contributions to cumulative regional greenhouse gas emissions.

Land use planning is considered to be a critical component of lowering GHG emissions. Examples of GHG emissions reduction planning techniques include locating the most intensive residential development near alternative transportation modes (regional and local transit), employment centers, and support commercial centers, and similarly, locating the most intensive employment development near alternative transportation modes (regional and local transit), residential concentrations, and support commercial centers. The proposed project would support these land use planning techniques by being located adjacent to, and physically and functionally integrated with, the proposed Intermodal Transit Center (ITC) project.

The proposed project would generate increased GHG emissions relative to existing conditions by introducing new residents and new employees on-site, thereby increasing the daily vehicle miles traveled (VMT) associated with the movement of people and goods to and from the site.

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[1]Consistent with CEQA and the EIR Project Description, in order to calculate "worst-case" GHG emissions for the proposed project, the following potential buildout option was assumed: 1,267 multi-family residential units; 182,000 square feet of office uses; 157,000 square feet of retail uses; and a 125-room hotel. This buildout option would result in up to approximately 3,839 new residents and 1,061 new employees (see EIR chapter 14, Population and Housing).

The proposed project would thereby contribute to annual long-term increases in GHGs as a result of VMT increases (mobile sources) and project operations associated with heating, energy use, water use, wastewater treatment, and solid waste disposal (indirect and area sources).

Table 7.1 shows projected GHG emissions in the form of carbon dioxide (CO_2) associated with anticipated project buildout as described in chapter 3 (Project Description) of this EIR (also see subsection 7.3.2, herein), as well as a "Business as Usual" scenario applying statewide average emission and usage rates, which do not take into account the GHG reductions associated with the proposed project's mix of land uses (residential, retail, office), pedestrian and bicycling opportunities, and proximity to transit.

CO_2 is the primary GHG emitted from land use type projects and represents over 95 percent of the GHG potential from these types of projects. The CO_2 modeling for this EIR has been conducted with the URBEMIS2007 model (Version 9.2.4) for mobile and area source emissions, and a separate calculation of electricity consumption for indirect sources (i.e., electricity consumption from project facilities and conveyance of water).

Emissions from Mobile and Area Sources. Mobile and area source emissions listed in Table 7.1 were calculated using the URBEMIS2007 model with the same inputs used to calculate emissions of air pollutants (see chapter 5, Air Quality, of this EIR). Mobile source emissions are based on the combination of projected vehicle travel and emission factors from the California Air Resources Board's EMFAC2007 model. Area source emissions are mostly comprised of the emissions associated with the combustion of natural gas consumed for space and water heating as well as cooking. The modeled emissions are based on typical residential and commercial natural gas combustion rates combined with emission factors for CO_2.

Emissions from Indirect Sources. Indirect source emissions from electricity usage were based on rates recommended by the California Climate Action Registry General Reporting Protocol[1] and documents prepared for the California Energy Commission (CEC).[2] These electricity usage rates were combined with electricity emission rates reported by PG&E. The California Commercial End Use Survey (prepared for CEC) provides annual electricity intensities for various non-residential uses. Residential electricity consumption rates for new and existing homes in California were based on the California Statewide Residential Appliance Saturation Study (published for CEC). CO_2 emission rates for electricity use in the PG&E service grid are 0.456 pound of CO_2 per kilowatt-hour.[3] It should be noted that the PG&E rate is about 60 percent of the statewide average emission rate for electricity production and 50 percent of the national average.

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[1]California Climate Action Registry, *California Climate Action Registry General Reporting Protocol – Reporting Entity-Wide Greenhouse Gas Emissions*, Version 3.0, April 2008.

[2]Itron, California End Use Commercial Survey, prepared for the California Energy Commission, CEC-400-2006-005, 2006; and KEMA-XENERGY, Itron RoperASW, California Statewide Residential Appliance Saturation Study – Volume 2, Study Results Final Report, CEC Consultant Report, June 2004.

[3]CARB, CCAR, ICLEI, *Local Government Operations Protocol for the quantification and reporting of Greenhouse Gas Emissions, Version 1.0*, September 2008.

Table 7.1
ESTIMATED PROJECT-RELATED INCREASES IN GREENHOUSE GAS EMISSIONS

Source	Calculation Methodology	Proposed Project Emissions (in metric tons per year)	Proposed Project "Business as Usual"[1] Emissions (in metric tons per year)
Mobile Sources	URBEMIS2007 operational emissions	18,472	21,504
	Less transit reductions = 670 trips[2]	-813	0
Area Sources	Natural gas consumption and URBEMIS2007 area emissions	1,843	1,843
Indirect Sources	Electricity consumption and PG&E emission rate	2,288	3,813
TOTAL		21,790	27,160
Net Difference (Proposed – Business as Usual): -5,370 (-19.8%)			
Efficiency Metric (metric tons per person: 3,839 residents + 1,061 employees)		4.47	5.54

SOURCE: Illingworth & Rodkin, Inc., Acoustics and Air Quality Consultants, 2010.

Notes:

[1] "Business as Usual" = applies statewide average emission and usage rates, not taking into account the GHG reductions associated with the proposed project's mix of land uses, pedestrian and bicycling opportunities, and proximity to transit.
[2] See chapter 16 (Transportation and Circulation), Table 16.10 (trip generation), of this EIR.

Possibility of Reduced Operational Emissions. The results reported in Table 7.1 apply to current emission rates. This will not likely be the case, as AB 32 will require GHG emission reductions in all sectors. Transportation emission rates will likely decrease due to increased fuel efficiency and lower carbon content in fuels. Fuel efficiency is regulated by the U.S. Department of Transportation and current CARB regulations that address climate change. Newer fuel standards would increase light-duty automobile and light-duty truck fuel efficiency by 10 miles per gallon (to 34 miles per gallon for cars sold in 2020). The CARB proposes more efficient standards as part of the State's efforts to reduce GHG emissions. These standards would apply to new vehicles sold and therefore would gradually affect the overall fleet as these new vehicles replace older vehicles.

Emissions from Project Construction. In addition to ongoing operational emissions, project construction activities would involve emissions associated with equipment and vehicles used for grading and construction of the project as well as emissions associated with manufacturing materials used to construct the project. Construction phases may include site grading, fine site grading, trenching, paving, building construction, and architectural coatings. There currently are no readily available methods of quantifying additional GHGs from the manufacture and transportation of building materials or the operation of construction equipment. Also, there are

no existing federal, State, regional, or local thresholds for construction-related emissions of GHGs.

Evaluation of Project Emissions. As of the writing of this EIR chapter, BAAQMD is proposing efficiency-based thresholds for projects and plans where appropriate Climate Action Plans have not been enacted. Efficiency is measured by considering the total emissions and the "Service Population." The Service Population (SP) is considered to be the total population plus employment associated with the projected emissions. Plan-based efficiency criteria are oriented toward large land uses plans (e.g., general plans and climate action plans) and not site-specific development proposals. Therefore, project-level thresholds would be more appropriate to apply to the proposed Hercules Bayfront Project. Anticipated project-related emissions are divided by the SP to compute the GHG efficiency metric (metric tons per person--see Table 7.1).

The proposed project would emit approximately 21,790 metric tons of CO_2 annually, without any project-specific mitigation measures to reduce traffic (e.g., TDM program) or energy consumption (e.g., incorporation of LEED measures). The project would generate up to approximately 3,839 new residents and 1,061 new employees. Dividing the total emissions by the number of new residents and employees results in an efficiency metric of approximately 4.5 metric tons of CO_2 per year per service population. This would not exceed the GHG efficiency metric of 4.6 metric tons of CO_2 per year per service population proposed by BAAQMD for evaluating GHG emissions from projects. As a result, the project and cumulative climate change impact would be considered ***less-than-significant.***

Mitigation. No significant impact has been identified; no mitigation is required.

Although the project and cumulative climate change impact would be considered less-than-significant, the mitigation measures identified in Mitigation 5-2 (chapter 5, Air Quality, e.g., transportation demand management measures, transit/bicycle provisions) could nonetheless still reduce the project's GHG emissions. In addition, Table 7.2 lists examples of GHG reduction measures identified by OPR that are reflected in the project characteristics or in the mitigation measures identified in EIR chapter 5 (Air Quality) or chapter 16 (Transportation and Circulation).[1]

[1]State of California Governor's Office of Planning and Research, *Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*, June 19, 2008, Attachment 3: Examples of GHG Reduction Measures.

Table 7.2
OPR-IDENTIFIED GHG REDUCTION MEASURES REFLECTED IN THE PROJECT AND MITIGATION MEASURES

GHG Reduction Measure Example[1]	Project or Mitigation Measure
Land Use and Transportation Measures:	
▪ Implement land use strategies to encourage jobs/housing proximity, promote transit-oriented development, and encourage high-density development along transit corridors. Encourage compact, mixed-use projects, forming urban villages designed to maximize affordable housing and encourage walking, bicycling and the use of public transit systems.	Project would implement all of these strategies.
▪ Encourage infill, redevelopment, and higher density development, whether in incorporated or unincorporated settings	Project would develop site consistent with planned high-density, mixed-use vision of the Waterfront District Master Plan.
▪ Encourage new developments to integrate housing, civic, and retail amenities (jobs, schools, parks, shopping opportunities) to help reduce VMT resulting from discretionary automobile trips.	Project would integrate all these uses (potential future school site [not part of project] is within walking distance of project site).
▪ Apply advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods, and services.	Mitigation measures are identified in EIR chapters 5 (Air Quality) and 16 (Transportation and Circulation) to implement TDM measures/facilities.
▪ Incorporate features into project design that would accommodate the supply of frequent, reliable, and convenient public transit.	Mitigation measures are identified in EIR chapters 5 (Air Quality) and 16 (Transportation and Circulation) to implement TDM measures/facilities.
▪ Implement street improvements that are designed to relieve pressure on a region's most congested roadways and intersections.	Mitigation measures are identified in EIR chapter 16 (Transportation and Circulation) to relieve roadway and intersection congestion.
Urban Forestry Measures:	
▪ Plant trees and vegetation near structures to shade buildings and reduce energy requirements for heating/cooling.	Project includes landscaping and planting standards as part of Form-Based Code.
▪ Preserve or replace on-site trees (that are removed due to development) as a means of providing carbon storage.	Project includes landscaping and planting standards as part of Form-Based Code.
Energy Conservation Policies and Actions:	
▪ Replace traffic lights, street lights, and other electrical uses to energy efficient bulbs and appliances.	Mitigation 5-2 calls for LEED certification or equivalent standards.
▪ Incorporate on-site renewable energy production, including installation of photovoltaic cells or other solar options.	Mitigation 5-2 calls for LEED certification or equivalent standards.
▪ Create bicycle lanes and walking paths directed to the location of schools, parks, and other destination points.	Such measures are already included in Waterfront District Master Plan. The proposed project would include new pedestrian and bicycle facilities,

	including public pathways through the project site and direct pedestrian connections to existing and new parks, plazas, open spaces, and trails.
Programs to Reduce VMT:	
▪ Encourage large businesses to develop commute trip reduction plans that encourage employees who commute alone to consider alternative transportation modes.	Mitigation measures are identified in EIR chapters 5 (Air Quality) and 16 (Transportation and Circulation) to implement TDM measures/facilities.
▪ Develop shuttle systems around business district parking garages to reduce congestion and create shorter commutes.	Mitigation measures are identified in EIR chapters 5 (Air Quality) and 16 (Transportation and Circulation) to implement TDM measures/facilities.
▪ Create an online ridesharing program that matches potential carpoolers immediately through email.	Mitigation measures are identified in EIR chapters 5 (Air Quality) and 16 (Transportation and Circulation) to implement TDM measures/facilities.

SOURCE: Wagstaff/MIG 2010.

GHG = Greenhouse Gas, VMT = Vehicle Miles Traveled

[1]State of California Governor's Office of Planning and Research, *Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review;* June 19, 2008, Attachment 3: Examples of GHG Reduction Measures.

Impact 7-1: Sea Level Rise Impacts on Project Development. Based on the BCDC sea level rise maps, the project may be affected by anticipated sea level rise and associated changes in broader flood plain boundaries. Potential impacts associated with future development that may be subject to sea level rise include risk to public safety and property damage, representing a ***potentially significant impact*** (see criterion [d] in subsection 7.3.1, "Significance Criteria," above).

As discussed in subsection 7.1.3(e) of this EIR chapter, portions of the project site may be vulnerable to both an approximately 16-inch sea level rise in San Pablo Bay by mid-century and an approximately 55-inch sea level rise in the Bay by end-of-century.

Mitigation 7-1. Before development proceeds, and as part of final development review, the City shall ensure that the development complies with the most current City requirements for protection from flood hazards, consistent with *Mitigation 11-4* in chapter 11 (Hydrology and Water Quality), of this EIR. These provisions would require compliance with associated storm drainage storage, building elevation, and flood-proofing requirements. In addition, the City shall require at its discretion, Hercules Bayfront Project construction of the shared Bay Trail facility retaining wall or other similar barrier adjacent to the railroad tracks, which would also act as a sea level rise protection wall, if the wall is not built as part of the ITC project. Implementation of these measures would be expected to reduce this impact to a ***less-than-significant level.***