APPENDIX F

GREENHOUSE GAS ANALYSIS

GREENHOUSE GAS ANALYSIS
FOR THE
SAN DIEGO NEW STADIUM PROJECT
SAN DIEGO, CALIFORNIA

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SECTION 1
INTRODUCTION

The San Diego Stadium project site is located in the City of San Diego south of Friars Road and at the northwest corner of the Interstate 15 and Interstate 8 intersection. The project includes a phased construction approach for the construction of a new stadium and demolition of the existing Qualcomm Stadium and parking lot. This greenhouse gas (GHG) analysis was prepared to support the City of San Diego environmental review process and provide information regarding potential impacts to global climate change associated with the construction and operation of the project.

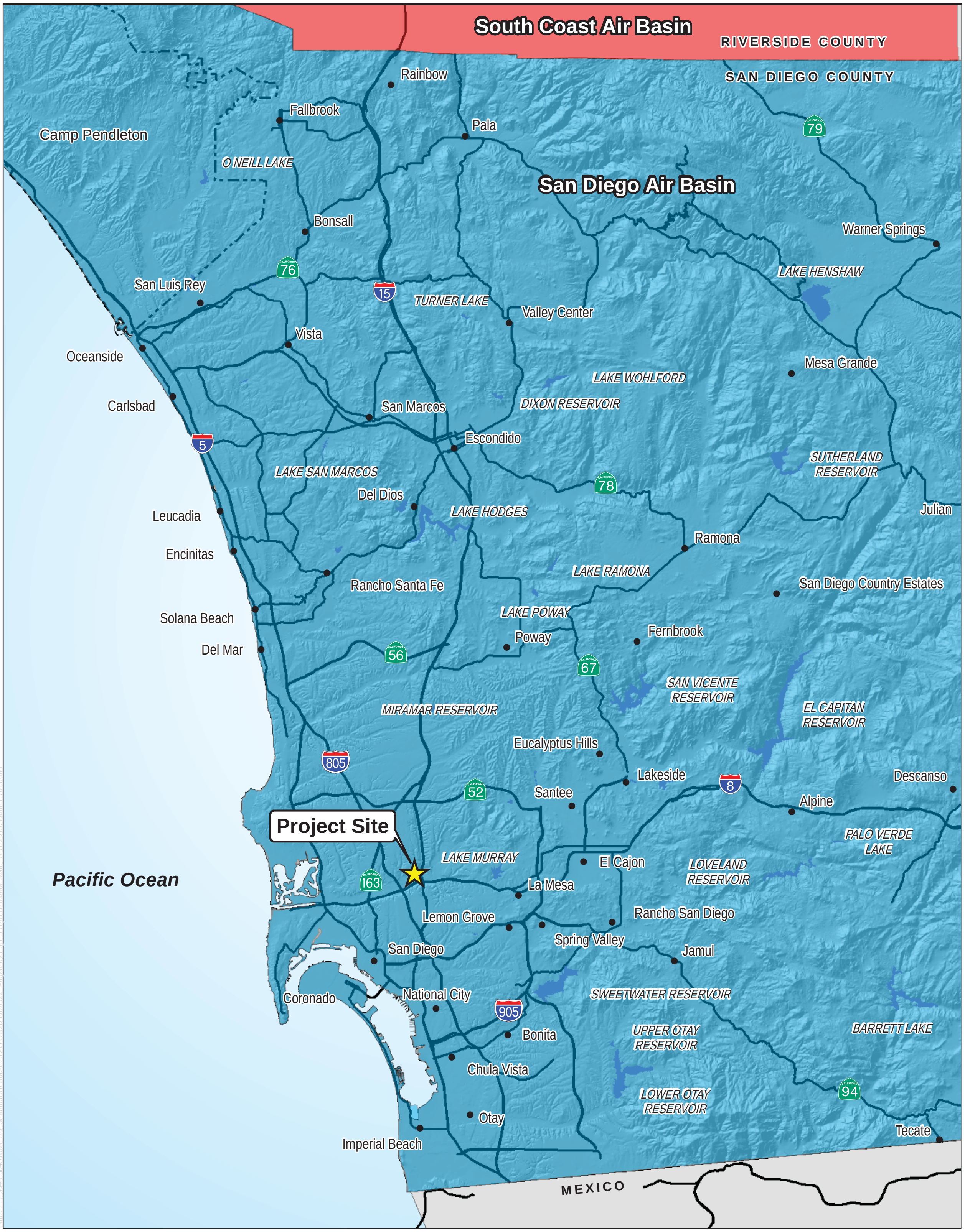
GHG emissions have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to global climate change. Global climate change also has the potential to result in sea level rise (resulting in flooding of low-lying areas), affect rainfall and snowfall (leading to changes in water supply and runoff), affect temperatures and habitats (affecting biological and agricultural resources), and result in many other adverse effects.

Legislation, regulations, and executive orders on the subject of climate change have established federal and statewide contexts and processes for developing an enforceable cap on GHG emissions. Given the nature of environmental consequences from GHGs and global climate change, the California Environmental Quality Act (CEQA) requires that lead agencies evaluate the cumulative impacts of GHGs, even relatively small additions, on a global basis.

The purpose of this report is to discuss global climate change and existing GHG emissions sources; summarize applicable federal, state, and local regulations; and analyze the impacts from construction and operation of the proposed development.

1.1 PROJECT DESCRIPTION

The project is located on approximately 166 acres in the City of San Diego. The project site is bounded by Friars Road on the north, Qualcomm Way on the west, Interstate 15 on the east, and Interstate 8 on the south (Figure 1). The adjacent land uses include residential on the north and northwest across Friars Road and on the east across Interstate 15. Commercial land uses are located adjacent to the project site on the west and south. Regional access is from Interstate 15 to the east, Interstate 8 to the south, and Interstate 805 approximately 1,200 feet to the west. Regional access is also provided by San Diego Metropolitan Transit System (MTS) Bus and Trolley.



Source: Esri; SanGIS; SANDAG; California Air Resources Board, 2004.

8 4 0 8 Miles

Scale: 1:506,880; 1 inch = 8 miles

Figure 1
Project Location

The northeast portion of the project site would be developed with the Project while the existing Qualcomm Stadium would remain operational until the Project is completed. Following the operation of the new stadium, the existing Qualcomm Stadium and parking lot would be demolished and redeveloped consistent with the Project design. The new stadium would be developed on approximately 17 acres compared to the approximate 15 acres for the existing Qualcomm Stadium. In addition, square footage in the Project would be approximately 1,750 thousand square feet (ksf) compared with the approximate 1,350 ksf at the exiting Qualcomm Stadium. Total seating capacity would be reduced from the existing 70,500 attendees to approximately 68,000 for the Project. The Project would include sustainable design measures, including achievement of LEED Gold Certification.

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SECTION 2
EXISTING CONDITIONS

2.1 SCIENTIFIC BASIS OF CLIMATE CHANGE

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters the earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back towards space. This infrared radiation (i.e., thermal heat) is absorbed by GHGs within the earth's atmosphere. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on the earth.

GHGs are present in the atmosphere naturally, are released by natural and anthropogenic sources, and are formed from secondary reactions taking place in the atmosphere. Natural sources of GHGs include the respiration of humans, animals and plants, decomposition of organic matter, and evaporation from the oceans. Anthropogenic sources include the combustion of fossil fuels, waste treatment, and agricultural processes. The following are GHGs that are widely accepted as the principal contributors to human-induced global climate change:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF_6)
- Nitrogen Trifluoride (NF_3)

Emissions of CO_2 are byproducts of fossil fuel combustion. CH_4 is the main component of natural gas and is associated with agricultural practices and landfills. N_2O is a colorless GHG that results from industrial processes, vehicle emissions, and agricultural practices. HFCs are synthetic chemicals used as a substitute for chlorofluorocarbons in automobile air conditioners and refrigerants. PFCs are produced as a byproduct of various industrial processes associated with aluminum production and the manufacturing of semiconductors. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable GHG used for insulation in electric power transmission and distribution equipment, and in semiconductor manufacturing. NF_3 is used in the electronics industry during the manufacturing of consumer items, including photovoltaic solar panels and liquid-crystal-display (i.e., LCD) television screens.

Global warming potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to CO_2. The GWP of a GHG is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time (i.e., lifetime) that the gas remains in the atmosphere ("atmospheric lifetime"). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main GHGs that have been attributed to human activity include CH_4, which has a GWP of 28, and N_2O, which has a GWP of 265 (IPCC 2013). For example, 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 28 tons of CO_2. GHGs with lower emissions rates than CO_2 may still contribute to climate change, because they are more effective at absorbing outgoing infrared radiation than CO_2 (i.e., high GWP). The concept of CO_2-equivalents (CO_2e) is used to account for the different GWP potentials of GHGs to absorb infrared radiation.

Although the exact lifetime of any particular GHG molecule is dependent on multiple variables, it is understood by scientists who study atmospheric chemistry that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. GHG emissions related to human activities have been determined as "extremely likely" to be responsible (indicating 95 percent certainty) for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's atmosphere and oceans, with corresponding effects on global circulation patterns and climate (ARB 2014a). The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, no single project is expected to measurably contribute to a noticeable incremental change in the global average temperature, or to a global, local, or micro climate.

2.2 GHG EMISSION SOURCES

GHG emissions contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, electric utility, residential, commercial, and agricultural categories. Emissions of CO_2 are byproducts of fossil fuel combustion, and CH_4, a highly potent GHG, is the primary component in natural gas and is associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management.

For purposes of accounting for and regulating GHG emissions, sources of GHG emissions are grouped into emission categories. The California Air Resources Board (ARB) identifies the following main GHG emission categories that account for most anthropogenic GHG emissions generated within California:

- *Transportation:* On-road motor vehicles, recreational vehicles, aviation, ships, and rail
- *Electric Power:* Use and production of electrical energy
- *Industrial:* Mainly stationary sources (e.g., boilers and engines) associated with process emissions
- *Commercial and Residential:* Area sources, such as landscape maintenance equipment, fireplaces, and consumption of natural gas for space and water heating
- *Agriculture:* Agricultural sources that include off-road farm equipment; irrigation pumps; crop residue burning (CO_2); and emissions from flooded soils, livestock waste, crop residue decomposition, and fertilizer volatilization (CH_4 and N_2O)
- *High GWP:* Refrigerants for stationary and mobile-source air conditioning and refrigeration, electrical insulation (e.g., SF_6), and various consumer products that use pressurized containers
- *Recycling and Waste:* Waste management facilities and landfills; primary emissions are CO_2 from combustion and CH_4 from landfills and wastewater treatment

California

ARB performs an annual GHG inventory for emissions and sinks of the six major GHGs. As shown in Figure 2, California produced approximately 459 million metric tons (MMT) of CO_2e in 2013. Combustion of fossil fuel in the transportation category was the single largest source of California's GHG emissions in 2013, accounting for 37 percent of total GHG emissions in the state. The transportation category was followed by the electric power category (including in-state and out-of-state sources), which accounts for 20 percent of total GHG emissions in California, and the industrial category, which accounts for 23 percent of the state's total GHG emissions (ARB 2015).

San Diego County

The University of San Diego School of Law, Energy Policy Initiative Center, prepared a GHG inventory for San Diego County in 2008. Total GHG emissions in San Diego County in 2012 were estimated to be 32.9 MMT of CO_2e. This represents an 11 percent increase compared to 1990 emissions levels of 29.5 MMT CO_2e (University of San Diego 2014). Transportation is the largest emissions sector, accounting for approximately 14 MMT of CO_2e, or 41 percent of total emissions. Energy consumption, including electricity and natural gas use, is the next largest source of emissions, at 32 percent of the total.

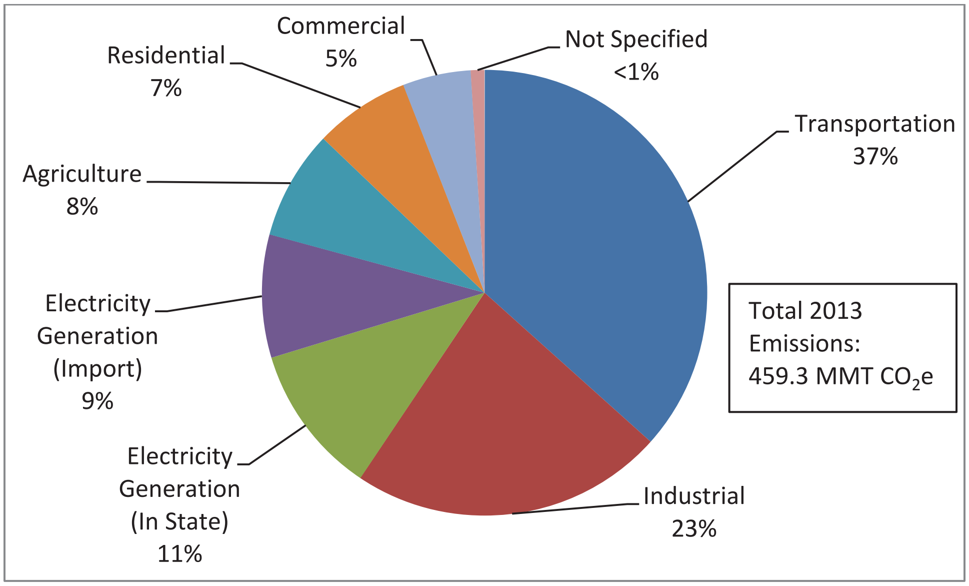

Figure 2. 2013 California GHG Emissions by Category

City of San Diego

The City of San Diego emitted approximately 15.5 million tons (MT) of GHGs in 1990 (City of San Diego 2005). Citywide emission levels were previously projected to result in an increase to 22.5 MT per year by 2010. The most recent GHG inventory for the year 2010 estimated the total emissions at 12.8 MMT CO_2e per year (City of San Diego 2014). Transportation is the largest emissions sector, accounting for approximately 55 percent of total emissions. Energy consumption is the next largest source of emissions, at 42 percent of the total. Accounting for future population and economic growth, the City estimates that GHG emissions will increase to approximately 14.0 MMT CO_2e in 2020 and 16.2 MMT CO_2e in 2035.

Existing Qualcomm Stadium

The Project Site is currently occupied by the existing Qualcomm Stadium, which actively holds events throughout the year. Operational activities include, but are not limited to professional football games, college football games, other sporting events (e.g., soccer, high school football), religious events, and parking lot-based events. Existing emissions were modeled using CalEEMod Version 2013.2.2 consistent with the methodologies discussed in Section 4.1, Air Quality of the DEIR, and later in this section. This analysis modeled the existing Qualcomm Stadium's annual GHG emissions using current attendance and utilities records. Table 1 presents the annual operational emissions associated with the existing Qualcomm Stadium. See Appendix B of the DEIR for detailed assumptions and modeling outputs.

Table 1
Existing Qualcomm Stadium Operational GHG Emissions

Emissions Source	Annual Operational Emissions (MT CO_2e)	Percent of Total Emissions (percent)
Area	0.14	<1%
Energy [1]	1,851	8.6%
Mobile (On-Road) [2]	19,047	88.0%
Waste	515	2.4%
Water [3]	226	1.0%
Toal Operational Emissions	21,639	**100%**

Note: GHG = greenhouse gases; MT CO_2e = metric tons of carbon dioxide equivalent.
Totals may not add due to rounding.
1 Energy emissions include electricity and natural gas consumption.
2 Represents on-road emissions associated with event operations.
3 Water-related emissions include both water consumption and wastewater generation.
Additional details available in Appendix B – Air Quality Technical Study of the DEIR.
Source: Modeled by AECOM in 2015

2.3 GLOBAL CLIMATE TRENDS AND ASSOCIATED IMPACTS

Trends of Climate Change

The Intergovernmental Panel on Climate Change (IPCC) concluded that variations in natural phenomena, such as solar radiation and volcanoes, produced most of the warming of the earth from pre-industrial times to 1950. These variations in natural phenomena also had a small cooling effect. From 1950 to the present, increasing GHG concentrations resulting from human activity, such as fossil fuel burning and deforestation, have been responsible for most of the observed temperature increase.

Global surface temperature has increased by approximately 1.53 degrees Fahrenheit (°F) over the last 140 years (IPCC 2013); however, the rate of increase in global average surface temperature has not been consistent. The last three decades have warmed at a much faster rate per decade (IPCC 2013).

During the same period when increased global warming has occurred, many other changes have occurred in other natural systems. Sea levels have risen; precipitation patterns throughout the world have shifted, with some areas becoming wetter and others drier; snowlines have risen in elevation, resulting in changes to the snowpack, runoff, and water storage; and numerous other conditions have been observed. Although it is difficult to prove a definitive cause-and-effect relationship between global warming and other observed changes to natural systems, there is a high level of confidence in the scientific community that these changes are a direct result of increased global temperatures caused by the increased presence of GHGs in the atmosphere (IPCC 2013).

Additional changes related to climate change can be expected by the year 2050 and on to the end of the century, including the following:

- California's mean temperature may rise by 2.7°F by 2050 and by 4.1°F to 8.6°F by the end of the century (CEC 2012). Temperatures in San Diego County may rise by 3.2°F to 5.7°F during that same period (CEC 2014).
- A consistent rise in sea level has been recorded worldwide over the last 100 years. Rising average sea level over the past century has been attributed primarily to warming of the world's oceans, the related thermal expansion of ocean waters, and the addition of water to the world's oceans from the melting of land-based polar ice (IPCC 2007). Sea level rise is expected to continue, and the most recent climate science report, Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future, has estimated that sea levels along the U.S. Pacific coast will increase by up to 66 inches by 2100 (NRC 2012). The project area would not be subject to flooding as a result of climate-change-related sea level rise.
- Various California climate models provide mixed results regarding forecasted changes in total annual precipitation in the state through the end of this century. However, recent projections suggest that 30-year statewide average precipitation will decline by more than 10 percent (CEC 2012).
- Historically, extreme warm temperatures in the San Diego region have mostly occurred in July and August, but as climate warming continues, the occurrences of these events will likely begin in June and could continue to take place into September. All simulations indicate that hot daytime and nighttime temperatures (heat waves) will increase in frequency, magnitude, and duration (San Diego Foundation 2008).

SECTION 3
REGULATORY FRAMEWORK

3.1 FEDERAL STANDARDS

The Environmental Protection Agency (EPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA). The Supreme Court of the United States ruled on April 2, 2007, that CO_2 is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs.

Greenhouse Gas Findings under the Federal Clean Air Act

On December 7, 2009, EPA signed two distinct findings regarding GHGs under section 202(a) of the CAA:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industries or other entities, this action was a prerequisite to finalizing EPA's *Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles*. On May 7, 2010, the final *Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards* were published in the Federal Register. The emissions standards will require model year 2016 vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, which is equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements.

On August 28, 2012, the U.S. Department of Transportation (USDOT) and EPA issued a joint Final Rulemaking requiring additional federal GHG and fuel economy standards for model year 2017 through 2025 passenger cars and light-duty trucks. The standards would require these vehicles to meet an estimated combined average emissions level of 163 grams of CO_2 per mile in model year 2025, which is equivalent to 54.5 miles per gallon if the improvements were made solely through fuel efficiency.

In addition to the standards for light-duty vehicles, USDOT and EPA adopted complementary standards to reduce GHG emissions and improve the fuel efficiency of heavy-duty trucks and buses on September 15, 2011. These standards together form a comprehensive heavy-duty national program for all on-road vehicles rated at a gross vehicle weight at or above 8,500 pounds for model years 2014 through 2018. The standards will phase in with increasing stringency in each model year from 2014 to 2018. The EPA standards adopted for 2018 will represent an average per-vehicle reduction in GHG emissions of 17 percent for diesel vehicles and 12 percent for gasoline vehicles (EPA 2011). The President has directed the USDOT and EPA to develop and issue the next phase of heavy-duty vehicle fuel efficiency and GHG standards by March 2016.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, EPA published the Final Mandatory Greenhouse Gas Reporting Rule (Reporting Rule) in the Federal Register. The Reporting Rule requires reporting of GHG data and other relevant information from fossil fuel and industrial GHG suppliers, vehicle and engine manufacturers, and all facilities that would emit 25,000 MT or more of CO_2e per year. Facility owners are required to submit an annual report with detailed calculations of facility GHG emissions on March 31 for emissions from the previous calendar year. The Reporting Rule also mandates recordkeeping and administrative requirements to enable EPA to verify the annual GHG emissions reports.

Council on Environmental Quality Guidance

On February 18, 2010, the Council on Environmental Quality (CEQ) chair issued a memorandum titled Draft National Environmental Policy Act (NEPA) Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions (U.S. Council on Environmental Quality). The draft guidance recognizes that many federal actions would result in the emission of GHGs, and that, where a proposed federal action may emit GHG emissions "in quantities that the agency finds may be meaningful," CEQ proposes that the federal agency's NEPA analysis focus on aspects of the environment that are affected by the proposed action and the significance of climate change for those aspects of the affected environment. In particular, the guidance proposes a reference point of 25,000 MT per year of direct GHG emissions as a "useful indicator" of when federal agencies should evaluate climate change impacts in their

NEPA documents. CEQ notes that this indicator is not an absolute standard or threshold to trigger the discussion of climate change impacts.

3.2 STATE STANDARDS

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act.

Assembly Bill 1493

Assembly Bill (AB) 1493 requires ARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with model year 2009. In June 2009, the EPA Administrator granted a CAA waiver of preemption to California. This waiver allowed California to implement its own GHG emissions standards for motor vehicles beginning with model year 2009. California agencies worked with federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger car model years 2017 to 2025.

Executive Order S-3-05

Executive Order S-3-05, signed in June 2005, proclaimed that California is vulnerable to the impacts of climate change. Executive Order S-3-05 declared that increased temperatures could reduce the Sierra Nevada’s snowpack, further exacerbate California’s air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established total GHG emissions targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

Assembly Bill 32

In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.). AB 32 further details and puts into law the mid-term GHG reduction target established in Executive Order S-3-05: reduce GHG emissions to 1990 levels by 2020. AB 32 also identifies ARB as the state agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target.

In December 2008, ARB adopted its *Climate Change Scoping Plan* (Scoping Plan), which contains the main strategies California will implement to achieve the required GHG reductions required by AB 32 (ARB 2008). The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of California's GHG inventory. ARB further acknowledges that decisions about 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 emissions sectors.

ARB is required to update the Scoping Plan at least once every 5 years to evaluate progress and develop future inventories that may guide this process. ARB approved the first update to the Climate Change Scoping Plan: Building on the Framework in June 2014 (ARB 2014a). The Scoping Plan update includes a status of the 2008 Scoping Plan measures and other federal, state, and local efforts to reduce GHG emissions in California, and potential actions to further reduce GHG emissions by 2020.

Executive Order S-1-07

Executive Order S-1-07, which was signed by then California governor Arnold Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at more than 40 percent of statewide emissions. Executive Order S-1-07 establishes a goal that the carbon intensity of transportation fuels sold in California should be reduced by a minimum of 10 percent by 2020. ARB adopted the low carbon fuel standard (LCFS) on April 23, 2009. ARB is currently considering re-adoption of an updated LCFS in 2015.

Senate Bill 97

Senate Bill (SB) 97 required the Governor's Office of Planning and Research to develop recommended amendments to the CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or an Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). On September 23, 2010, ARB adopted regional GHG targets for passenger vehicles and light trucks for 2020 and 2035 for the 18 MPOs in California. If MPOs do not meet the GHG reduction targets, transportation projects 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 cycle from 5 years to 8 years for local governments located within an MPO that meet certain requirements. City or county land use policies (including general plans) are not required to be consistent with the RTP (and associated SCS or APS). However, new provisions of CEQA would incentivize qualified projects that are consistent with an approved SCS or APS, categorized as “transit priority projects.”

The San Diego Association of Governments’ (SANDAG) current GHG targets are per capita CO_2 emission reductions from passenger vehicles of 7 percent by 2020 and 13 percent by 2035 relative to 2005 levels. SANDAG adopted the RTP/SCS in 2011. ARB reviewed the adopted RTP/SCS and determined that, if implemented, it would achieve the reduction targets for the San Diego region in compliance with SB 375.

ARB is required to update the regional GHG targets at least every eight years, and may revise them every four years. ARB is planning to revise the 2035 GHG targets for the four largest MPOs, including the (SANDAG), in 2015.

Assembly Bill 900

AB 900 (Jobs and Economic Improvement Through Environmental Leadership Act) was signed by Governor Jerry Brown in September 2011. The Act established procedures to streamline environmental review for qualifying, “leadership projects.” Any challenges to an EIR that qualifies as a “leadership project” would be evaluated immediately in the Court of Appeals, where the court has a maximum of 175 days to issue a decision on the challenge. “Leadership projects” can range from residential, retail, commercial, sports, cultural, entertainment, or recreational uses. The project must also meet certain qualifications, such as achieving a minimum of LEED Silver certification, resulting in at least 10 percent greater transportation efficiency than comparable projects, be an infill site, and be located in an area where an SCS has been adopted, among others. With respect to GHG emissions, qualifying projects cannot result in a net increase of GHG emissions, and all mitigation measures are required to be enforced and monitored.

Executive Order B-30-15

In April 2015, Governor Edmund Brown issued an executive order establishing a statewide GHG reduction goal of 40 percent below 1990 levels by 2030. The emission reduction target acts as an interim goal between the AB 32 goal (i.e., achieve 1990 emission levels by 2020) and Governor Brown’s Executive Order S-03-05 goal of reducing statewide emissions 80 percent below 1990 levels by 2050. In addition, the executive order aligns California's 2030 GHG reduction goal with the European Union's reduction target (i.e., 40 percent below 1990 levels by 2030) that was adopted in October 2014.

3.3 LOCAL STANDARDS

ARB also acknowledges that local governments have broad influence and, in some cases, exclusive jurisdiction over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations.

San Diego Air Pollution Control District

In San Diego County, the San Diego Air Pollution Control District (SDAPCD) is the agency responsible for protecting public health and welfare through the administration of federal and state air quality laws and policies. The SDAPCD has no regulations relative to GHG emissions.

City of San Diego

General Plan

The City of San Diego adopted an updated General Plan in 2008. The following policies contained in the Conservation Element of the General Plan are applicable to the project:

- CE-A.2. Reduce the City's carbon footprint. Develop and adopt new or amended regulations, programs, and incentives as appropriate to implement the goals and policies set forth in the General Plan to:
    - Create sustainable and efficient land use patterns to reduce vehicular trips and preserve open space;
    - Reduce fuel emission levels by encouraging alternative modes of transportation and increasing fuel efficiency;
    - Improve energy efficiency, especially in the transportation sector and buildings and appliances;
    - Reduce the Urban Heat Island effect through sustainable design and building practices;
    - Reduce waste by improving management and recycling programs.
- CE-A.5. Employ sustainable or "green" building techniques for the construction and operation of buildings.

- Develop and implement sustainable building standards for new and significant remodels of residential and commercial buildings to maximize energy efficiency, and to achieve overall net zero energy consumption by 2020 for new residential buildings and 2030 for new commercial buildings.

- CE-A.8. Reduce construction and demolition waste in accordance with Public Facilities Element, Policy PF-I.2, or by renovating or adding on to existing buildings, rather than constructing new buildings.

- CE-A.9. Reuse building materials, use materials that have recycled content, or use materials that are derived from sustainable or rapidly renewable sources to the extent possible, through factors including:
  - Scheduling time for deconstruction and recycling activities to take place during project demolition and construction phases;
  - Using life cycle costing in decision-making for materials and construction techniques. Life cycle costing analyzes the costs and benefits over the life of a particular product, technology, or system.

- CE-A.10. Include features in buildings to facilitate recycling of waste generated by building occupants and associated refuse storage areas.
  - Provide permanent, adequate, and convenient space for individual building occupants to collect refuse and recyclable material.
  - Provide a recyclables collection area that serves the entire building or project. The space should allow for the separation, collection and storage of paper, glass, plastic, metals, yard waste and other materials as needed.

- CE-A.11. Implement sustainable landscape design and maintenance.
  - Strategically plant deciduous shade trees, evergreen trees, and drought tolerant native vegetation, as appropriate, to contribute to sustainable development goals.
  - Reduce use of lawn types that require high levels of irrigation.
  - Minimize the use of landscape equipment powered by fossil fuels.
  - Implement water conservation measures in site/building design and landscaping.
  - Encourage the use of high efficiency irrigation technology, and recycled site water to reduce the use of potable water for irrigation. Use recycled water to meet the needs of development projects to the maximum extent feasible.

- CE-A.12. Reduce the San Diego Urban Heat Island, through actions such as:
  - Using cool roofing materials, such as reflective, low heat retention tiles, membranes and coatings, or vegetated eco-roofs to reduce heat build-up;

- Planting trees and other vegetation, to provide shade and cool air temperatures;
- Reducing heat build-up in parking lots through increased shading or use of cool paving materials as feasible.

Climate Protection Plans

The City of San Diego has taken steps to address climate change impacts at a local level. On January 29, 2002, the San Diego City Council approved the San Diego Sustainable Community Program, including participation in the Cities for Climate Protection program, establishment of a 15 percent GHG reduction goal set for 2010, and direction to use the recommendations of a scientific advisory committee to improve the GHG Emission Reduction Action Plan and to identify additional community actions.

The City of San Diego's first Climate Protection Action Plan was approved in 2005. By adopting a goal of 15 percent reduction of baseline (1990) levels, the City hoped to reduce emissions to 13.2 MT of GHG per year by 2010. Measures to reduce emissions included transportation, energy efficiency and renewable energy, waste reduction and recycling, urban heat island policy, and environmentally preferable purchasing for City purchases.

The City of San Diego distributed a draft Climate Action Plan (CAP) in July 2015. The draft CAP quantifies GHG emissions; establishes reduction targets for 2020 and 2035; identifies strategies and measures to reduce GHG levels; and provides guidance for monitoring progress on an annual basis. The draft CAP is anticipated to be considered for adoption by the end of 2015.

SECTION 4
ANALYSIS OF IMPACTS

4.1 THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the CEQA Guidelines, a project's GHG emissions and its incremental contribution to global climate change would be considered significant if it would do either of the following:

- generate GHG emissions, either directly or indirectly, that may have a significant cumulative impact on the environment, or
- conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

The SDAPCD has neither quantitative thresholds nor specific guidelines for determining the significance of impacts under CEQA. The City of San Diego CAP is currently being revised and GHG analyses occur on a project-by-project basis. The City uses an interim threshold to determine whether a GHG analysis is required for projects subject to CEQA analysis.

The City's memorandum "Addressing Greenhouse Gas Emissions from Projects Subject to CEQA", August 2010, provides guidance for the evaluation of GHG emissions from land use development projects. The memorandum recommends that the conservative, quantitative threshold of 900 MT CO_2e per year be used as a screening criteria to evaluate the potential impact of a project's GHG emissions. If a project does not exceed 900 MT CO_2e per year, then the climate change impacts would be less than significant and would not require additional analysis.

If the project exceeds 900 MT CO_2e per year, then the City assesses significance based upon whether the project would impede the implementation of AB 32. To demonstrate that the project would not impede the implementation of AB 32, the project must demonstrate how future GHG emissions generated by the project would be reduced to 28.3 percent below projected business-as-usual levels in 2020.

4.2 METHODOLOGY

Construction

Construction-related emissions associated with typical construction activities, such as site grading, construction and demolition, were modeled using the California Emissions Estimator Model (CalEEMod), Version 2013.2.2. CalEEMod allows the user to enter project-specific construction information, such as types, number, and horsepower of construction equipment, and number and length of off-site motor vehicle trips. Construction-related GHG exhaust emissions for the Project were estimated for construction worker commutes, haul trucks, and the use of off-road equipment. All project-specific construction assumptions and parameters are consistent with those used in Chapter 4.1, "Air Quality" of the DEIR. See Appendix B of the DEIR for detailed construction assumptions and modeling outputs.

Based upon guidance from the Association of Environmental Professionals (AEP), the total construction GHG emissions associated with a project are amortized over 30 years for Project construction, and added to the operational GHG emissions (AEP 2010).

Operational

Following construction of the Project, day-to-day operational activities would generate emissions from a variety of sources. Pursuant to the state CEQA Guidelines (Section 15125[e]) this analysis evaluates the net change in operational emissions from the existing Qualcomm Stadium at the time of the Notice of Preparation (i.e., 2015) to the new stadium, which is assumed to be operational in 2019.

CalEEMod estimates operational GHG emissions associated with development of a project, including transportation, electricity, natural gas, solid waste, water and wastewater, and area-source emissions. It should be noted that the Project is not a typical land use development project and therefore when possible, this analysis uses stadium-specific consumption rates (e.g., electricity, natural gas, mobile sources, water, and solid waste) based on and the existing Qualcomm Stadium historical data to model existing (2015) operational activities. For the new stadium, consumption rates from the existing Qualcomm Stadium were adjusted to account for the differences in the new stadium that would occur at full buildout (2019). Operational GHG emissions may be both direct and indirect emissions, and would be generated by area and mobile sources associated with the Project. Area-source emissions would be associated with activities such as maintenance of landscaping and grounds. Natural gas combustion for space and water heating is also a direct area source of GHG emissions. Solid waste disposal and wastewater treatment from operation of the new stadium would result in indirect, off-site emissions of GHGs.

Indirect emissions sources include emissions from electricity generation at off-site utility providers. Consumption of water and generation of wastewater would also result in indirect GHG emissions because of the electricity consumption associated with the off-site conveyance, distribution, and treatment of water and wastewater.

Mobile-source GHG emissions generated by vehicle trips from attendees, workers, vendors, and event participants were modeled using trip generation information from the traffic study (AECOM 2015a). The traffic study evaluated the various existing and proposed events that would occur at the Project Site over a calendar year. In addition, vehicle class information for attendees and visitors was obtained from recent Qualcomm Stadium records, which was used to model GHG emissions in CalEEMod. As discussed above, the year 2015 was used to model existing conditions and year 2019 was used to model the Project operations.

For electricity-related GHG emissions, emission factors specific to San Diego Gas and Electric (SDG&E) were obtained from Energy Model Report (AECOM 2015b). The SDG&E-specific emission factor accounts for the current electricity portfolio mix used to produce power for the Project and compliance with RPS. The natural gas GHG emission factor was obtained from CalEEMod.

For water consumption, water-related energy intensities (i.e., kilowatt-hour per gallon of water provided) were also obtained from CalEEMod, which contains southern California-specific water energy intensities from the California Energy Commission's Refining Estimates of Water-Related Energy Use in California. Water consumption associated with the Project and from the existing Qualcomm Stadium was obtained from Chapter 4.14, "Public Utilities" of the DEIR Water-related electricity consumption was calculated by multiplying the annual water consumption (e.g., million gallons) by the water-related energy intensity. Because the source, infrastructure, and electricity used to supply water to San Diego and the Project Site varies, a California-specific electricity emission factor was used to calculate water-related GHG emissions.

For wastewater generation, this analysis conservatively assumed that 85 percent of the water consumption would be treated. In other words, 85 percent of the water used would be captured by the sewage system, which is the high end of the range of the wastewater capture (VWD 2010). CalEEMod calculates wastewater-related CH4 emissions using methodologies and default assumptions IPCC's 2006 Guidelines for National Greenhouse Gas Inventories. This analysis uses the methodologies with an updated GWP for CH4 from IPCC's Fifth Assessment (IPCC 2013).

For solid waste, CalEEMod does not contain waste generation rates that would be applicable to the Project. Therefore, waste generation rates for the existing Qualcomm Stadium based on a waste generation rate per stadium seat factor (i.e., annual tons of solid waste per seat) were used to estimate annual solid waste generation (AECOM 2015c). Emission factors developed for waste streams similar to the Project (i.e., sporting events, concerts, and other entertainment events) were used to quantify the Project's solid waste GHG emissions (OPR 2015).

4.3 PROJECT IMPACTS

This section determines whether the potential impacts from project construction and operation would result in a significant impact. Significant impacts are defined below in relation to the thresholds of significance outlined in Section 4.1 (Thresholds of Significance). If the project would exceed the applicable threshold and potentially result in a significant impact, mitigation measures are required to reduce the potential impact to below a level of significance. If the project would not exceed the applicable threshold, mitigation measures are not required, although recommended measures are provided below to help reduce GHG emissions. In addition, the project's design and purpose will be evaluated for its consistency with the applicable GHG reduction plan.

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

Construction

Construction-related GHG exhaust emissions would be generated by sources such as heavy-duty off-road equipment, trucks hauling materials to the site, and construction worker commutes. GHG emissions generated by construction would be primarily in the form of CO_2. While emissions of other GHGs, such as CH_4 and N_2O, are important with respect to global climate change, emission levels of other GHGs are less dependent on the emissions-generating activities associated with the Project than are levels of CO_2. However, emissions and associated GWP of CH_4 and N_2O were incorporated into the total CO_2e emissions of the Project to provide an accurate estimate of total project-related emissions.

As described above in Methodology, all construction-related assumptions and parameters used to model GHG emissions are consistent with those described in Chapter 4.1, "Air Quality" of the DEIR. Construction-related GHG emissions were estimated at an annual maximum of 21,320

MT CO_2e per year during 2019, and 48,270 MT CO_2e over the entire 5-year construction period. The project's total construction emissions were amortized over 30 years and added to annual operational emissions to be evaluated. Table 2 presents the Project's annual, total, and amortized construction emissions.

Table 2
Proposed Project Construction-Related GHG Emissions

Construction Year	Emissions (MT CO_2e)
2016	822
2017	11,690
2018	11,717
2019	21,320
2020	2,723
Total	**48,270**
Amortized Construction Emissions[1]	**1,609**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent.
[1] Construction emissions were amortized over a 30-year period.
Source: Modeled by AECOM in 2015

As described above, the Project's amortized construction-related emissions are evaluated further along with operational emissions.

Operations

Operational GHG emissions were estimated for the Qualcomm Stadium and the Project at full buildout to determine the net change in operational emissions. As described above, amortized construction emissions were added to the net change to compare with the City's threshold of significance. Table 3 presents the annual operational GHG emissions for the existing Qualcomm Stadium in 2015 and GHG emissions projected to occur at full buildout of the Project in 2019, and the net change between the Project and the existing conditions.

The analysis first discusses the net change in GHG emissions between the existing Qualcomm Stadium and the Project. Then to determine whether the project would impede implementation of AB 32, the analysis demonstrates that the Project would achieve the required 28.3 percent reduction in GHG emissions from BAU levels in 2020. "Business-as-usual" refers to the level of GHG emissions that the Project would emit if it does not take into account any GHG reduction measures. It is a projection of GHG emissions in the future if the analysis assumes that California, the local agencies, or the project do not include any measures to reduce GHG emissions.

Table 3
Existing and Proposed Project Operational GHG Emissions

Emissions Source	Existing Qualcomm Stadium Emissions (MT CO_2e)	New Stadium Emissions (MT CO_2e)	Net Change in Emissions from Existing (MT CO_2e)
Area	0.14	0.14	0
Energy [1]	1,851	1,779	(73)
Mobile (On-Road) [2]	19,047	33,636	14,589
Waste	515	535	(20)
Water [3]	226	493	268
Operational Emissions	21,639	36,444	14,805
Amortized Construction Emissions [4]	–	1,609	–
Total Emissions	21,639	38,053	16,414

Note: BAU = business as usual.
Emissions shown in parentheses represent negative emissions (i.e., net decrease in emissions from existing conditions).
Totals may not add due to rounding.
1 Energy emissions include electricity and natural gas consumption.
2 Represents on-road emissions associated with event operations.
3 Water-related emissions include both water consumption and wastewater generation.
4 Construction emissions are amortized over 30 years and added to the net change in emissions.
Additional details available in Appendix B – Air Quality Technical Study, of the DEIR.
Source: Modeled by AECOM in 2015

The business-as-usual emissions for the Project were estimated using 2005 emission factors, and therefore, do not include any improvements associated with state programs, such as Title 24 standards, AB 1493, or the LCFS. In addition, the business-as-usual estimates do not include any benefits associated with the project location, such as pedestrian improvements or increased transit use.

Net Change

Mobile Source

As indicated in the Chapter 3.0, "Project Description" of the DEIR, in addition to its other planned uses, the Project would be designed specifically for use by an NFL team. However the new stadium is expected to be used for other non-NFL events. The annual activities are similar to the type of events that have occurred at Qualcomm Stadium, but are anticipated to increase over existing conditions. The traffic study estimated the number and types of vehicle trips that occur during annual operation of the existing Qualcomm Stadium and the projected number and type of vehicle trips that would occur during annual operation of the new stadium. Therefore, as shown in Table 3, the net change in mobile source emissions between the Project and the existing Qualcomm Stadium is a result of increased event frequency projected for the new stadium.

Electricity and Natural Gas

The energy sector would include both electricity and natural gas consumption. As discussed in Chapter 4.3, "Energy" of the DEIR, electricity consumption was based on actual meter readings at Qualcomm stadium between 2014 and 2015. The electricity usage was 5,768 MWh per year for the existing Qualcomm Stadium. The Energy Modeling Report modeled electricity and natural gas consumption associated with the Project and the existing Qualcomm Stadium (AECOM 2015b). The energy modeling estimated that the proposed increase in floor area and number of events for the new stadium would result in a 10 percent and 26 percent increase in annual electricity and natural gas consumption, respectively (AECOM 2015b).

The new stadium would also incorporate several design measures that would reduce GHG emissions from a variety of emission sources. These design measures would include achieving LEED Gold Certification among others. Although many of the credits and features to achieve LEED Gold Certification would result in GHG emission reductions, LEED provides a level of flexibility for projects to choose the exact credits and project features. LEED credits include categories, including, but not limited to location and transportation (e.g., access to quality transit), energy (e.g., renewable energy production), and water efficiency (USGBC 2015).

It is anticipated that the measures used by the project to achieve LEED Gold Certification would reduce GHG emissions from a variety of sources (e.g., energy, water, solid waste, transportation). The new stadium would include solar photovoltaic (PV) panels that would provide a minimum of 100 kilowatts of renewable energy developed on-site. The reduction in GHG emissions were estimated for the amount of solar generation that would be provided by the Project. At the time of this analysis, the exact LEED credits and project features that would be selected to achieve LEED Gold Certification (i.e., 60-79 LEED credits) have not yet been determined, and therefore, no additional GHG reductions were taken for achievement of LEED Gold Certification. The net change in energy-related GHG emissions shown in Table 3 is a result of increased energy consumption for the new stadium.

Solid Waste

The new stadium would result in a net decrease in the total number of seats compared to the existing Qualcomm Stadium (i.e., from 70,560 existing seats to 68,000 seats for the new stadium). However, for existing conditions, the attendance rate (i.e., 65,432 attendees was used to estimate existing solid waste generation. The annual solid waste generated by the new stadium and Qualcomm Stadium was estimated using waste generation rates (i.e., tons of waste generated per seat) from the existing Qualcomm Stadium (AECOM 2015c). The net change in solid waste emissions is shown in Table 4.5-3.

Water

The water consumption associated with the new stadium and the existing Qualcomm Stadium was estimated in Chapter 4.14, “Public Utilities” of the DEIR. Therefore, the net change in water-related GHG emissions shown in Table 3 is a result of increased water consumption for the new stadium.

In addition to the water-related GHG emissions, the Project would also generate wastewater as a result of its operations. Because the amount of wastewater generated would depend on water consumption, the net change in wastewater-related GHG emissions shown in Table 3 is a result of increased water consumption for the new stadium.

As shown in Table 3, the Project would result in a net increase of 16,414 MT CO_2e from existing conditions, including amortized construction emissions.

Business As Usual

In order to demonstrate that Project would achieve the required 28.3percent reduction in GHG emissions, this analysis modeled the Project (i.e., new Stadium) under BAU conditions (year 2005). The following analysis describes how the Project’s operational emissions were modeled using 2005 data, which are presented in Table 4.

Construction

At this time, the City of San Diego has not adopted policies or recommended performance measures to address specific GHG emission reductions related to construction. Even though emission rates for construction equipment and on-road vehicles improve from BAU conditions (resulting in lower construction-related GHG emissions), the analysis conservatively assumes that construction-related emissions for the Project would be the same as BAU conditions. Therefore, amortized construction emissions are not included in the BAU analysis.

Table 4
Estimated Business-as-Usual and Project Annual GHG Emissions

Emissions Source	BAU Emissions (MT CO_2e) [1]	New Stadium Emissions (MT CO_2e)	Net Change in Emissions (MT CO_2e)	Percent Reduction from BAU
Area	0.14	0.14	(0.01)	3.7%
Energy [2]	2,602	1,779	(823)	31.6%
Mobile (On-Road) [3]	48,890	33,636	(15,254)	31.2%
Waste	701	535	(166)	23.7%
Water [4]	520	493	(27)	15.7%
Total Operational Emissions	52,713	36,444	(16,270)	30.9%
BAU Threshold				28.3%
Meets Threshold?				YES

Note: BAU = business as usual; MT CO_2e = metric tons of carbon dioxide equivalent; MTS = metropolitan transit service.
Totals may not add due to rounding.
At this time, the City of San Diego has not adopted policies or recommended performance measures to address specific GHG emission reductions related to construction. Even though emission rates for construction equipment and on-road vehicles improve from BAU conditions (resulting in lower construction-related GHG emissions), the analysis conservatively assumes that construction-related emissions for the Project would be the same as BAU conditions. Therefore, amortized construction emissions are not included in the BAU analysis.
[1] BAU emissions represent emissions under year 2005 conditions.
[2] Energy emissions include electricity and natural gas consumption.
[3] Represents on-road emissions associated with event operations.
[4] Water-related emissions include both water consumption and wastewater generation.
Additional details available in Appendix B – Air Quality Technical Study of the DEIR.
Source: Modeled by AECOM in 2015

Mobile Sources

For mobile source emissions, CalEEMod contains emission factors from EMFAC2011 that incorporate the emission reductions associated with Pavley I (AB 1493) and Low Carbon Fuel Standard (LCFS). The amount of reductions associated with Pavley I emission standards would increase from its inception year (2009) to the last year where it would affect vehicle emission standards (i.e., model year 2016 vehicles). Similarly, the first year of LCFS implementation was 2011, after which required reductions would increase until 2020, which is the full implementation year for LCFS. In addition, the fleet turnover and increases in fuel and emission efficiencies independent of AB 1493 and LCFS would further reduce emission at full buildout compared to BAU conditions. Therefore, as shown in Table 4, mobile source emissions associated with the new stadium in the buildout year (2019) would be reduced by 31.2 percent compared to BAU conditions (2005), when AB 1493 and LCFS were not in effect.1

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1 This mobile source reduction would be slightly higher than typical land use development projects because of the vehicle class distribution (i.e., fleet mix) used in the analysis. The on-road motor vehicles for the visitors to the stadium would primarily be passenger vehicles (i.e., light-duty autos and light-duty trucks). This is a higher percentage than the County average, which would include more heavy-duty vehicles (that are not affected by AB 1493 vehicle emission standards). Since the majority of vehicles traveling to the project site would be directly

Energy

For electricity and natural gas consumption, the Energy Modeling Report modeled the Project assuming use of the existing building envelope and energy efficiency (i.e., existing Qualcomm Stadium building efficiency), which was used to represent the energy consumption for the new stadium operating under a BAU scenario (AECOM 2015b). The electricity and natural gas consumption for the BAU scenario was assumed to be 7,175 MWh and 67,035 therms per year, respectively. This energy consumption is a result of less energy efficient systems (e.g., heating, cooling, lighting) than the current and future Title 24 standards. Electricity consumption for the new Stadium was modeled to be 6,322 MWh per year, which is an 12 percent reduction from BAU conditions resulting from increases in energy efficiency standards in the new stadium. Annual natural gas consumption for the Project would be 56,259 therms, or a 16 percent decrease from BAU conditions.

In addition, as described above, Executive Order S-14-08 established a RPS to 33 percent by 2020. In order to achieve the RPS in 2020, utilities such as SDG&E have been increasing their renewable resources for energy production. Therefore, all electricity consumption from SDG&E sources would decrease in GHG intensity (i.e., GHG emissions generated per kilowatt-hour) as the RPS is met. Emission factors specific to SDG&E's projected 2020 electricity intensity assuming compliance with the 33 percent RPS were used to calculate electricity-related GHG emissions for the new stadium. These emission factors would account for the GHG-reductions associated with SDG&E increasing the percent of renewable energy in their electricity portfolio. As a result of increases in energy efficiency and RPS requirements for SDG&E, total GHG emissions related to energy consumption (electricity and natural gas) for the Project would be reduced by 32 percent compared to BAU conditions (see Table 4).

Solid Waste

For the solid waste sector, consumption rates were conservatively assumed to remain constant from current to BAU conditions. As a result of the Recycling Ordinance and other local policies, the City of San Diego waste diversion rate increased from 52 percent in 2004 to 68 percent in 2012. The increased diversion rate would result in a reduction of 31 percent from business-as-usual conditions. Therefore, it is anticipated that solid waste disposed under BAU conditions would be approximately 31 percent higher than that during buildout of the new stadium. Compared to BAU conditions, the new stadium would result a 23.7 percent reduction in solid waste-related GHG emissions (see Table 4).

affected by AB 1493, the Project would result in higher reductions compared with other projects that use a default San Diego County vehicle class distribution.

Water

The water sector would include GHG emissions from water consumption and wastewater generation. The water consumption levels for the water and wastewater sector were assumed to remain constant from BAU to the new stadium. It is anticipated that the new stadium's water fixtures and increases in water efficiency infrastructure would result in a net reduction in water consumption; however, these reductions cannot be accurately calculated and therefore constant water consumption levels were assumed. However, the electricity intensity factor for water conveyance under the new stadium would be lower than BAU conditions. In other words, the California statewide electricity portfolio would have become less carbon-intensive as additional renewable energy sources have been developed. Therefore, as shown in Table 4, assuming similar water consumption and wastewater generation rates under the new stadium and BAU conditions, the new stadium would result in a 15.7 percent reduction in water-related GHG emissions compared to BAU conditions as result of a cleaner statewide electricity production.

Significance of Impacts

When accounting for California statewide emission reduction measures included in the Scoping Plan, City waste diversion programs, increases in energy efficiency standards, and other increases in emissions technology, this analysis estimates that the Project at full buildout would result in a 30.9 percent reduction in long-term operational GHG emissions from BAU conditions, and therefore would not impede the implementation of AB 32. Therefore, the Project would not generate GHG emissions that may have a significant impact on the environment. This impact would be less than significant.

Although the Project would not exceed impede implementation of AB 32, in order to apply for AB 900 CEQA streamlining, a project cannot result in a net increase of GHG emissions from construction or operational emissions. Therefore, in the case that the Project would apply for AB 900, the following Project Improvement Measure would be required, but is not a required mitigation measure.

Project Improvement Measure: Purchase Voluntary Carbon Credits

Calculations of construction and long-term operational emissions that span the useful lifetime of the project (e.g., 30 years) performed with methodology agreed upon by ARB in connection with the AB 900 certification shall be developed. Courtesy copies of the operational calculations shall be provided to ARB and the Governor's office as part of the AB 900 application. One or more contracts shall be executed to purchase voluntary carbon credits from a verified GHG emissions credit broker in an amount sufficient to offset construction and operational GHG emissions over the lifetime of the project. Carbon credits shall be purchased at a net present value although the contracts could propose acquiring the credits in advance of the emission-generating activities to be offset. Copies of the contract(s) shall be provided in the AB 900 application to ARB and the Governor's office to verify that construction and lifetime operational emissions have been offset. The improvement measure will become effective after final approval and certification of the AB 900 application by the Governor's office.

Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHG?

At the time of this writing, the City of San Diego's CAP is still in draft form and therefore cannot be considered as an approved plan. Once reviewed and approved, City of San Diego CAP will establish strategies and measures to meet the GHG reduction target. The environmental review process for the draft CAP has not yet been completed, and the details of any applicable measures were not available at the time of this analysis. Therefore, for the purposes of this analysis, the applicable GHG reduction plan to evaluate the project against is the statewide AB 32 Scoping Plan. Projects that would be consistent with the goals and strategies of the AB 32 Scoping Plan would be considered not to conflict with the plan's purpose of reducing GHG emissions.

ARB's First Update to the Climate Change Scoping Plan: Building on the Framework (Scoping Plan Update) includes updates to measures and strategies established to meet California's goal of reducing emissions to 1990 levels by 2020 and also reiterates the state's role in the long-term goal established in Executive Order S-3-05, which is to reduce GHG emissions to 80 percent below 1990 levels by 2050. The Scoping Plan Update confirms that the state is on track to meet the 2020 emissions reduction target, but will need to maintain and build upon its existing programs, scale up deployment of clean technologies, and provide more low-carbon options to accelerate GHG emission reductions, especially after 2020, in order to meet the 2050 target. However, the plan does not recommend additional measures for meeting specific GHG emissions limits beyond 2020. In general, the measures described in the plan are designed to meet emissions goals in 2020 and have not yet been adjusted to meet emission reduction targets after 2020.

The Scoping Plan did not directly create any regulatory requirements for construction of the Project. However, measures included in the Scoping Plan would indirectly address GHG emissions levels associated with construction activities, including the phasing-in of cleaner technology for diesel engine fleets (including construction equipment) and the development of a low-carbon fuel standard. The Project would comply with any mandate or standards set forth by the Scoping Plan update.

With respect to land use planning and transportation-related emissions, which are the largest emission sector in the state (see Figure 1), SB 375 includes regional emission reduction goals for 2020 and 2035, and requires each MPO to develop an SCS that aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. The San Diego Association of Governments (SANDAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) determined that the region will achieve the GHG emissions reduction goals set by ARB of 7 percent per capita GHG reductions from passenger vehicles by 2020 and 13 percent by 2035 (SANDAG 2011).

SANDAG plans are developed based on land use, population, and commercial/industrial growth projections from local jurisdictions in the region, including the City of San Diego. The City of San Diego General Plan was approved in 2008 and includes strategies that focus growth into mixed-use activity centers that are pedestrian-friendly and linked to an improved regional transit system. Projects consistent with the City of San Diego's General Plan would be considered to comply with the planning efforts in the SANDAG RTP/SCS, which was designed to achieve the region's fair-share GHG emission reductions pursuant to AB 32. Therefore, projects consistent with the City of San Diego's General Plan would also be consistent with the GHG emission reduction goals of the AB 32 Scoping Plan.

The Project is not a typical land use development project, but it would be responsible for significant trip generation as a result of the events that are anticipated to be scheduled at the venue (see Chapter 3.0, "Project Description" of the DEIR, Table 3-4 for detailed existing and anticipated annual event details). The Project would be consistent with the overall GHG reduction strategies of the SCS, Scoping Plan, and General Plan to reduce mobile source emissions and increase energy efficiency. The Project would be located at the same site as the existing Qualcomm Stadium to take advantage of the multi-modal access (i.e., public transit and multiple freeways). However, as part of the project design (i.e., reduced parking), the Project would encourage attendees to maximize the use of current public transit infrastructure (i.e., San Diego MTS). In addition, the reduced parking would also encourage attendees that cannot use public transit to utilize remote transit-oriented and parking facilities to reduce VMT coming to the Project Site. See Chapter 4.10, "Mobility (Circulation)" of the DEIR for more description of how the project design would increase public transit and reduce VMT to the Project Site. Although the Project would increase the number of annual events held at the Project site, which could increase annual VMT, it is anticipated that reduced parking availability would increase the rate of use of public transit by an average of 7 percent for the Project (see Tables 4.10-13 and

Tables 4.10-14 in Chapter 4.10, “Mobility [Circulation]” of the DEIR). As determined in Chapter 4.10, “Mobility (Circulation)” of the DEIR (Table 4.10-8), it is anticipated that the Project’s reduced parking would result in a 12.6 percent and 11.5 percent reduction in total trips for weekday and weekend game events, respectively.

The Scoping Plan also cites energy efficiency and renewable energy as key strategies for achieving the State’s GHG reduction targets. The Project would achieve LEED Gold Certification and would be built according to the most recent Title 24 standards, which would increase energy efficiency beyond the existing Qualcomm Stadium. Although it is anticipated that energy efficiency would increase with the Project, overall energy consumption was projected to increase by 10 percent and 26 percent for electricity and natural gas as a result of increased stadium space event frequency per year. Additional on-site project design features, beyond minimum code requirements, would reduce total energy consumption and decrease reliance on fossil fuels.

As discussed in Section 3, the project will also be designed to have “no net increase” in total annual energy consumption related to electricity and natural gas use compared to existing conditions. Furthermore, the new stadium would include solar photovoltaic (PV) panels that would provide a minimum of 100 kilowatts of renewable energy on-site. This could be fixed PV panels mounted on up to five acres of new carport structures within the northwestern portion of the stadium surface parking lot or located on the roof of the new stadium. Therefore, it is anticipated that overall the Project would result in greater energy efficiency and increased renewable energy production for the Project Site beyond existing conditions. Therefore, the Project would be consistent with General Plan Policies CE-I.10, CE-I.12, and CE-I.5 that promote renewable energy and would also comply with the overarching GHG reduction strategies of AB 32 Scoping Plan (i.e., energy efficiency, renewable energy).

As discussed above, the Project would achieve LEED Gold Certification, which would require a minimum number of features to increase on-site water conservation and efficiency. Although the exact features that would be used to qualify for LEED Gold Certification have not yet been finalized, the Project (as discussed in Chapter 3.0, “Project Description” of the DEIR) would include access to quality transit, renewable energy production, and water efficiency. In addition, restrooms would be equipped with waterless urinals, low-flow toilets, and sensor faucets to reduce overall water use beyond existing conditions. These project design features would comply with General Plan Policies CE-B.4 and CE-E.2, and be consistent with the Scoping Plan’s strategy to increase water efficiency, which would subsequently decrease energy consumption and GHG emissions associated with water and wastewater treatment.

The Project would include design features (i.e., reduced parking and LEED Gold Certification) consistent with the General Plan and the Scoping Plan that increase transportation, energy, and water efficiency at the new stadium compared to existing conditions. Therefore, the Project would not conflict with existing California legislation that has been adopted to reduce statewide GHG emissions. Neither the City nor any other agency with jurisdiction over this project has adopted climate change or GHG reduction measures with which the project would conflict. Therefore, the Project would not conflict with any applicable plan, policy, or regulation for the purpose of reducing GHG emissions. This impact would be less than significant.

Significance of Impacts

The Project would include design features consistent with the General Plan and the Scoping Plan that increase transportation, energy, and water efficiency at the new stadium compared to existing conditions. Therefore, the Project would not conflict with existing California legislation that has been adopted to reduce statewide GHG emissions. Neither the City nor any other agency with jurisdiction over this Project has adopted climate change or GHG reduction measures with which the Project would conflict. Therefore, the Project would not conflict with any applicable plan, policy, or regulation for the purpose of reducing GHG emissions. This impact would be less than significant.

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SECTION 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The Proposed Project would generate a net change of GHG emissions that would exceed the City's 900 MT CO_2e/year threshold. However, the Project would achieve a 30.9 percent in long-term operational GHG emissions compared to BAU 2005 conditions (see Table 4), which would exceed the City's required 28.3 percent reduction (from BAU conditions) for projects that exceed the 900 MT CO_2e threshold. Therefore, because the Proposed Project would achieve the City's GHG emission reduction threshold requirement to comply with the Scoping Plan, the project would not generate a net change of GHG emissions, either directly or indirectly, that may have a significant impact on the environment. The project would not conflict with any applicable plan, policy, or regulation for the purpose of reducing GHG emissions. This impact would be considered less than significant. Therefore, the project would not result in any significant climate change impacts.

5.2 RECOMMENDATIONS

No mitigation measures or GHG emissions reduction measures are recommended unless the Project is approved for final certification of an AB 900 application for CEQA streamlining, in which case, the Project shall implement Project Improvement Measure as follows: .

Project Improvement Measure: Purchase Voluntary Carbon Credits

Calculations of construction and long-term operational emissions that span the useful lifetime of the project (e.g., 30 years) performed with methodology agreed upon by ARB in connection with the AB 900 certification shall be developed. Courtesy copies of the operational calculations shall be provided to ARB and the Governor's office as part of the AB 900 application. One or more contracts shall be executed to purchase voluntary carbon credits from a verified GHG emissions credit broker in an amount sufficient to offset construction and operational GHG emissions over the lifetime of the project. Carbon credits shall be purchased at a net present value although the contracts could propose acquiring the credits in advance of the emission-generating activities to be offset. Copies of the contract(s) shall be provided in the AB 900 application to ARB and the Governor's office to verify that construction and lifetime operational emissions have been offset. The improvement measure will become effective after final approval and certification of the AB 900 application by the Governor's office.

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SECTION 6
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APPENDIX A

CALEEMOD AND GREENHOUSE GAS MODELING DATA

Please refer to Appendices A and B of the Air Quality Technical Study (Appendix B of the Stadium Reconstruction Project)

(*ON CD-ROM*)

Qualcomm Stadium
Summary of Construction and Operational GHG Emissions (Net Change and BAU Analysis)

Construction Year	Emissions ($MT CO_2e$)
2016	822
2017	11,690
2018	11,717
2019	21,320
2020	2,723
Total	**48,270**
Project Lifetime (years)	30
Amortized Emissions	**1,609.01**

OPERATIONAL EMISSIONS

	Net Change Analysis (EXISTING CONDITIONS)		
Emissions Source	**2015 Existing Project Emissions ($MT CO_2e/yr$)**	**2019 Project Emissions ($MT CO_2e/yr$)**	**Net Change ($MT CO_2e/yr$)**
Energy	1,851	1,779	(73)
Electricity	1,613	1,479	(134)
Natural Gas	238	299	61
Area	0.14	0.14	-
Mobile (On-Road)	19,047	33,636	14,589
Solid Waste	515	535	20
Water-Related	226	493	268
Water	66	143	78
Wastewater	160	350	190
Total	21,639	36,444	14,805
Total (+ Amortized Contruction for Project)	21,639	38,053	16,414

Note: The analysis compares the net increase from existing conditions (2015) to the Project in 2019 (operational year of the project).

OPERATIONAL EMISSIONS

	BAU Analysis			
Emissions Source	**BAU (2005) Emissions ($MT CO_2e/yr$)**	**Project Emissions ($MT CO_2e/yr$)**	**Net Change ($MT CO_2e/yr$)**	**Percent Reduction from BAU**
Energy	2,602	1,779	(823)	-31.6%
Electricity	2,245	1,479	(766)	-34.1%
Natural Gas	357	299	(57)	-16.1%
Area	0.14	0.14	(0.01)	-3.7%
Mobile (On-Road)	48,890	33,636	(15,254)	-31.2%
Solid Waste	701	535	(166)	-23.7%
Water	520	493	(27)	-15.7%
Water Consumption	170	143	(27)	-15.7%
Wastewater Treatment	350	350	-	
Total	52,713	36,444	(16,270)	-30.9%

Note: The analysis conservatively uses the operational year of 2019 for the Project emissions rather than 2020.

New Stadium
Operational GHG Emissions (Energy)

Existing Energy Consumption (Qualcomm Stadium) -2015

Energy Type	Amount	Units	Emissions ($MT\ CO_2e/yr$)
Electricity	5,768	MWh	1,612.99
Natural Gas	44,758	therms	238.23
Total			1,851.22

Proposed Energy Consumption (Stadium Reconstruction)

Energy Type	Amount	Units	Emissions ($MT\ CO_2e/yr$)
Electricity	6,322	MWh	1,523.64
Natural Gas	56,259	therms	299.45
Total			1,823.09

Business As Usual Consumption (Stadium Reconstruction with Qualcomm Features)

Energy Type	Amount	Units	Emissions ($MT\ CO_2e/yr$)
Electricity	7,175	MWh	2,245.06
Natural Gas	67,035	therms	356.80
Total			2,601.86
Note: BAU assumes expanded floor area (1,750,000 sq. ft.) consistent with the Project, but constructed with existing building envelope, HVAC efficiencies and lighting power density. See Energy Report for additional details.			

Emission Factors

Operational Year/ Pollutant	Emission Factor	Units	GWP
Electricity with RPS (SDG&E)			
2015	617	lbs CO_2e/MWh	
2019	531	lbs CO_2e/MWh	
2020	510	lbs CO_2e/MWh	1
Electricity (SDG&E) 2005 Surrogate (Average of 2004-2007)			
CO_2	686.82	lbs/MWh	1
CH_4	30.24	lbs/GWh	28
N_2O	8.08	lb/GWh	265
Natural Gas			
CO_2	53.06	kg/MMBtu	1
CH_4	0.005	kg/MMBtu	28
N_2O	0.0001	kg/MMBtu	265

Sources:
2010, 2014, 2020, and 2035 SDG&E EF: http://www.sandiego.gov/planning/genplan/cap/
2013 SDG&E EF: Energy Technical Report (AECOM)
Electricity (CH4 and N2O): eGRID 2010 WECC California
2005 SDG&E EF: Local Government Operations Protocol (Table G.6)
Electricity (CH4 and N2O): eGRID 2005 WECC California
NG EF: General Reporting Protocol Version 3.1
GWP: IPCC. 2013. Fifth Assessment Report: Climate Change 2013

New Stadium
Operational Emissions (Renewable Energy)

Proposed Energy Consumption (Stadium Reconstruction)

Category	Amount	Units	Emissions (MT CO_2e/yr)
Solar PV	185	MWh	(44.58)
Total			(44.58)

Emission Factors

Operational Year/ Pollutant	Emission Factor	Units	GWP
Electricity with RPS (SDG&E)			
2019	531	lbs CO_2e/MWh	1
Electricity (SDG&E) 2005 Surrogate (Average of 2004-2007)			
CO_2	686.82	lbs/MWh	1
CH_4	30.24	lbs/GWh	28
N_2O	8.08	lb/GWh	265
Natural Gas			
CO_2	53.06	kg/MMBtu	1
CH_4	0.005	kg/MMBtu	28
N_2O	0.0001	kg/MMBtu	265

Sources:

2010, 2014, 2020, and 2035 SDG&E EF: http://www.sandiego.gov/planning/genplan/cap/

2013 SDG&E EF: Energy Technical Report (AECOM)

Electricity (CH4 and N2O): eGRID 2010 WECC California

2005 SDG&E EF: Local Government Operations Protocol (Table G.6)

Electricity (CH4 and N2O): eGRID 2005 WECC California

NG EF: General Reporting Protocol Version 3.1

GWP: IPCC. 2013. Fifth Assessment Report: Climate Change 2013

New Stadium
Operational GHG Emissions (Mobile)

Project Stadium Annual Emissions (2019)

Event Type	Events/Year	Emissions (lbs CO_2e/yr)
NFL Pre-Season	10	12,183,803
NFL Post-Season (including Super Bowl)	3	4,356,389
SDSU Football (and Bowl Games)	8	5,272,255
Mountain West Championship	1	776,796
High School Football	3	1,032,420
Soccer Games	5	2,779,491
Concerts	2	1,617,373
Monster Truck	1	808,687
Supercross	1	913,971
Large Events	10	6,590,318
Medium Events	52	25,702,184
Small Events	55	9,061,749
Minor	195	3,059,440
Total Annual Mobile Source Emissions (lbs/year)		74,154,876
Total Annual Mobile Source Emissions (tons/year)		33,636

New Stadium
Operational Emissions (Mobile)

Existing Stadium Annual Emissions (2015)

Event Type	Events/Year	Emissions (lbs CO_2e/yr)
Existing NFL Pre-Season	10	15,088,097
Existing NFL Post-Season (including Super Bowl)	0	-
SDSU Football (and Bowl Games)	8	6,492,252
Mountain West Championship	0	-
High School Football	3	1,275,265
Soccer Games	2	1,938,664
Concerts	0	-
Monster Truck	1	1,011,164
Supercross	1	1,133,571
Large Events	4	3,246,126
Medium Events	4	2,434,589
Small Events	30	6,086,527
Minor	170	3,284,394
Total Annual Mobile Source Emissions (lbs/year)		41,990,650
Total Annual Mobile Source Emissions (tons/year)		19,047

New Stadium
Operational Emissions (Mobile)

BAU Annual Emissions (2005)

Event Type	Events/Year	Emissions (lbs CO_2e/yr)
NFL Pre-Season	10	17,257,114
NFL Post-Season (including Super Bowl)	3	5,769,283
SDSU Football (and Bowl Games)	8	7,596,016
Mountain West Championship	1	1,134,131
High School Football	3	1,492,076
Soccer Games	5	5,670,654
Concerts	2	2,366,149
Monster Truck	1	1,183,074
Supercross	1	1,326,292
Large Events	10	9,495,020
Medium Events	52	37,030,494
Small Events	55	13,055,740
Minor	195	4,407,896
Total Annual Mobile Source Emissions (lbs/year)		107,783,939
Total Annual Mobile Source Emissions (tons/year)		48,890.0

New Stadium
Operational GHG Emissions (Solid Waste)

Category	Amount	Unit	Solid Waste Generation Rate (ton/seat/yr)	Annual Solid Waste (tons)	Emission Factor (MT CO_2e/MT Waste)	Emissions (MT CO_2e/yr)
Existing Condition (2015)						
Qualcomm Stadium	65,432	Seats	0.042	2,748	0.207	515.24
Proposed (2019)						
Stadium Reconstruction	68,000	Seats	0.042	2,856	0.207	535.46
BAU (2005)						
Stadium Reconstruction	68,000	Seats	0.042	3,741	0.207	701.46

Note: MT CO2e = metric tons of carbon dioxide equivalent; MT = metric tons.
Waste Generation Rate Source:
AECOM. 2015. Waste Management Plan. San Diego, CA
Waste Generation Rate for BAU:

The City of San Diego diversion rate has increased from 52 percent in 2004 to 68 percent in 2012 (31 percent increase). The BAU rate does not include the increased diversion rate (i.e., landfilled waste is 31% higher in the BAU condition).

New Stadium
Operational GHG Emissions (Water Consumption)

Category	MG	MWh	Emission Factor CO_2 (lb/MWh)	GWP	Emission Factor CH_4 (lb/MWh)	GWP	Emission Factor N_2O (lb/MWh)	GWP	Total CO_2e Emissions (MT CO_2e/yr)
Existing Conditions (Qualcomm 2015)									
Water	19	206	610.82	1	0.02849	28	0.00603	265	57
Wastewater Energy	16	30	610.82	1	0.02849	28	0.00603	265	8
New Stadium (2019)									
Water	40	450	610.82	1	0.02849	28	0.00603	265	125
Wastewater Energy	34	66	610.82	1	0.02849	28	0.00603	265	18
Business-As-Usual (2005)									
Water	40	450	724.12	1	0.03024	28	0.00808	265	148
Wastewater Energy	34	66	724.12	1	0.03024	29	0.00808	266	22

Notes: MG = million gallons; MWh = megawatt-hours; CO2 = carbon dioxide; lb = pounds; GWP = global warming potential; CH4 = methane; N2O = nitrous oxide; MT CO2e/yr = metric tons of carbon dioxide equivalent.

Sources:

CEC. 2006. Refining Estimates of Water-Related Energy Use in California prepared by Navigant Consulting, Inc.

Electricity EF (Existing and Proposed): eGRID 2010 WECC California (http://www.epa.gov/cleanenergy/documents/egridzips/eGRID_9th_edition_V1-0_year_2010_Summary_Tables.pdf)
Electricity EF (BAU): eGRID 2005 WECC California (https://www.chargepoint.com/files/eGRID2007V1_1_year05_GHGOutputRates.pdf)

	Indoor (kWh/MG)		Outdoor (kWh/MG)	
	Northern CA	Southern CA	Northern CA	Southern CA
Water Supply&Conveyance	2,117	9,727	2,117	9,727
Water Treatment	111	111	111	111
Water Distribution	1,272	1,272	1,272	1,272
Wastewater Treatment	1,911	1,911	-	-
Regional Total	5,411	13,021	3,500	11,110

CEC. 2006 (December). Refined Estimates of Water-Related Energy Use in California

New Stadium
Operational GHG Emissions (Wastewater)

	Influent Emissions					
Facility/Jurisdiction	**Influent (MG/yr)**	**Influent (gal/yr)**	**Influent BOD (mg/L)**	**Influent BOD (kg/yr)**	**Adjusted BOD Emission Factor (kg CH4/kg BOD)**	**Influent Emissions (MT CO_2e)**
Existing Qualcomm Stadium	15.7	15,725,000	200	11,903.83	0.48	160
New Stadium	34.4	34,405,280	200	26,044.80	0.48	350

Notes: MG/yr = million gallons per year; gal/yr = gallons per year; BOD = biochemical oxygen demand; mg/L = milligrams per liter; kg/yr = kilgrams per year; kg CH4 = kilgrams of methane; MT CO2e = metric tons of carbon dioxide equivalent.
Source:
Intergovernmental Panel on Climate Change 2006. IPCC Guidelines for National Greenhouse Gas Inventories; Chapter 6: Wastewater Treatment and Discharge

Methane Parameters

Emission Factor (kg CH4/kg BOD) (EF = Max CH4 * MCF)	**Max CH_4 Producing Capacity (kg CH_4/kg BOD)**	**Methane Correction Factor**	**CH_4 GWP**	**Conversion (liter/gal)**	**WW % of Indoor Water**
0.48	0.6	0.8	28	3.785	85%

Equation 6.2 IPCC Chapter 6
Methane Producing Capacity and MCF are LGOP defaults consistent with CalEEMod (Appendix A)
GWP 100-year from IPCC 2013