III.E. GREENHOUSE GAS EMISSIONS

The following analysis of greenhouse gas (GHG) emissions is based on the MGA Campus Project, Air Quality, Greenhouse Gas and Noise Impact Report prepared by Terry A. Hayes Associates Inc. (TAHA), dated July 2014. This report is included in its entirety as **Appendix C** of this Draft EIR.

EXISTING CONDITIONS

POLLUTANTS AND EFFECTS

Greenhouse Gases and the Greenhouse Effect Climate Change

GHGs are those gaseous constituents of the atmosphere, both natural and anthropogenic (human generated), that absorb and emit radiation at specific wavelengths within the spectrum of terrestrial radiation emitted by the earth's surface, the atmosphere itself, and by clouds.[1] Simply put, the greenhouse effect compares the Earth and the atmosphere surrounding it to a greenhouse with glass panes. The glass panes in a greenhouse let heat from sunlight in and reduce the amount of heat that escapes. GHGs, such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), keep the average surface temperature of the Earth close to 60 degrees Fahrenheit (°F). Without the greenhouse effect, the Earth would be a frozen globe with an average surface temperature of about 5°F. However, human activities in the past century have substantially increased the amount of greenhouse gases in the atmosphere, causing the atmosphere to trap more heat and leading to changes in the Earth's climate.[2] Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer. One aspect of Climate Change is Global Warming, which refers to the recent and ongoing rise in global average temperature near Earth's surface. It is caused mostly by increasing concentrations of GHG in the atmosphere. Global Warming is causing climate patterns to change.[3] Rising global temperatures have been accompanied by changes in weather and climate. Many places have seen changes in rainfall, resulting in more floods, droughts, or intense rain, as well as more frequent and severe heat waves. The planet's oceans and glaciers have also experienced some changes - oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising. As these and other changes become more pronounced in the coming decades, they will likely present challenges to our society and the environment.

Types of Greenhouse Gases

In addition to CO_2, CH_4, and N_2O, GHGs include hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and water vapor. CO_2 is the most abundant pollutant that contributes to climate change through fossil fuel combustion.[4] CO_2 comprised 81 percent of the total GHG emissions in California in 2002, and non-fossil fuel CO_2 comprised 2.3 percent.[5] The other GHGs are less

1 Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2013: The Physical Science Basis, Fifth Assessment Report*, ISBN 978 1 107 05799-1 Hardback; 978 1 66182-0 Paperback. 2013.

2 United States Environmental Protection Agency (USEPA), *Greenhouse Gases*, accessed March 10, 2014, http://www.epa.gov/climate/climatechange/science/indicators/ghg/index.html.

3 Ibid.

4 U.S. Department of Energy - Energy Information Administration, Office of Integrated Analysis and Forecasting. *Emissions of Greenhouse Gases in the United States*, 1995.

5 California Environmental Protection Agency (Cal/EPA), Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006.

abundant but have higher global warming potential than CO_2. To account for this higher potential, emissions of other GHGs are frequently expressed in the equivalent of CO_2, denoted as CO_2e. CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential (GWP) of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. **Table III.E-1-1** shows various GWP.

TABLE III.E-1
GLOBAL WARMING POTENTIAL FOR SELECTED GREENHOUSE GASES

Pollutant	Lifetime (Years)	Global Warming Potential (20-Year)	Global Warming Potential (100-Year)
Carbon Dioxide	100	1	1
Nitrous Oxide	121	264	265
Nitrogen Triflouride	500	12,800	16,100
Sulfur Hexaflouride	3,200	17,500	23,500
Perflourocarbons	3,000-50,000	5,000-8,000	7,000-11,000
Black Carbon	days to weeks	270-6,200	100-1,700
Methane	12	84	28
Hydroflourocarbons	Uncertain	100-11,000	100-12,000

SOURCE: CARB, *First Update to the Climate Change Scoping Plan*, May 2014.

Expressing emissions in CO_2e takes the contributions of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. The CO_2e of CH_4 and N_2O represented 6.4 and 6.8 percent, respectively, of the 2002 California GHG emissions. Other high GWP gases represented 3.5 percent of these emissions.[6] In addition, a number of human-caused pollutants such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds, and sulfur dioxide have indirect effects on terrestrial or solar radiation absorption by influencing the formation or destruction of other climate-change emissions.

Sources of Greenhouse Gas Emissions

Emissions of GHGs contributing to global climate change are attributable, in large part, to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural sectors.[7] In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation. Emissions of CO_2 are by-products of fossil fuel combustion.[8] CH_4, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management.[9] CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, respectively, two of the most common processes of CO_2 sequestration.[10]

6 Cal/EPA, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006.
7 IPCC, Climate Change, The Physical Science Basis, Fifth Assessment Report, 2013.
8 CARB, First Update to the Climate Change Scoping Plan: Building on the Framework, May 2014.
9 USEPA, Methane and Nitrous Oxide Emissions from Natural Sources, 2010.
10 USEPA, Carbon Sequestration through Reforestation, A Local Solution with Global Impact, March 2012.

REGULATORY SETTING

Federal

National Policy. With regard to GHG emissions and global climate change, in 2002, President George W. Bush set a national policy goal of reducing the GHG emission intensity (tons of GHG emissions per million dollars of gross domestic product) of the nation's economy by 18 percent by 2012. No binding reductions were associated with the goal. The United States instead opted for a voluntary and incentive-based approach toward GHG emissions reductions, identified as the Climate Change Technology Program (CCTP). CCTP is a multi-agency research and development coordination effort, led by the Secretaries of Energy and Commerce.

Supreme Court Ruling. The U.S. Supreme Court ruled in *Massachusetts v. Environmental Protection Agency, 127 S. Ct. 1438 (2007)*, that CO_2 and other GHGs are pollutants under the federal Clean Air Act (CAA), which the United States Environmental Protection Agency (USEPA) must regulate if it determines they pose an endangerment to public health or welfare. On December 7, 2009, USEPA Administrator made two distinct findings: (1) the current and projected concentrations of the six key GHGs in the atmosphere (i.e., CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threatens the public health and welfare of current and future generations; and (2) the combined emissions of these GHGs from motor vehicle engines contribute to GHG pollution which threatens public health and welfare.

USEPA subsequently published its endangerment finding for GHGs in the Federal Register. The USEPA Administrator determined that six GHGs, taken in combination, endanger both the public health and welfare of current and future generations. Although the endangerment finding discusses the effects of six GHGs, it acknowledges that transportation sources only emit four of the key GHGs: CO_2, CH_4, N_2O, and HFCs. Further, the USEPA Administrator found that the combined emissions of these GHGs from new motor vehicles contribute to air pollution that endangers the public health and welfare under the CAA, Section 202(a)

Reporting Requirements. USEPA requires large emitters of GHG to collect and report data. Fossil fuel and industrial GHG suppliers, motor vehicle and engine manufacturers, and facilities that emit 25,000 metric tons or more of CO_2 equivalent per year to report GHG emissions annually data to USEPA. The Rule is referred to as 40 Code of Federal Regulations (CFR) Part 98-Greenhouse Gas Reporting Program.

Energy Independence and Security Act (EISA). In response to the *Massachusetts v. Environmental Protection Agency* ruling, the Bush Administration issued an executive order on May 14, 2007, directing USEPA, the United States Departments of Transportation, and the United States Departments of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. On December 19, 2007, the EISA was signed into law, which requires an increased corporate average fuel economy (CAFE) standard of 35 miles per gallon (mpg) for the combined fleet of cars and light trucks by model year 2020.

EISA requires establishment of interim standards (from 2011 to 2020) that will be the maximum feasible average fuel economy for each fleet. On October 10, 2008, the National Highway Traffic Safety Administration (NHTSA) released a final environmental impact statement analyzing interim standards for model years 2011 to 2015 passenger cars and light trucks. NHTSA issued a final rule for model year 2011 on March 23, 2009. In addition to setting increased CAFE standards for motor vehicles, the EISA included other provisions: (1) renewable fuel standard (RFS) (Section 202); (2) appliance and lighting efficiency standards

(Sections 301–325); and (3) building energy efficiency (Sections 411-441). Additional provisions addressed energy savings in government and public institutions, promoting research for alternative energy, additional research in carbon capture, international energy programs, and the creation of green jobs. On May 19, 2009, President Obama announced a national policy for fuel efficiency and emissions standards in the United States auto industry. The federal standards apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles built in model years 2012 through 2016.

In addition, on September 15, 2009, President Obama proposed new fuel efficiency standards for cars and trucks that required fuel economy to increase by five percent annually. In 2016, new cars and trucks will have to achieve an average rating of 35.5 mpg, four years sooner than the law now requires. Alternatively, manufacturers could meet this requirement if their vehicles, on average, emit no more than 250 grams of CO_2 per mile.

Stationary Source Regulations. Under the CAA, once a pollutant is regulated under any part of the Act, (as was case with GHG emissions after the motor vehicle regulations were finalized in April 2010) major new sources or modifications are subject to the Prevention of Significant Deterioration (PSD) program and to Title V operating permits. In the PSD program, major new or modified stationary sources (such as power plants and manufacturing facilities) are required to implement best available control technologies for pollution abatement.

The Tailoring Rule. On May 13, 2010, USEPA issued the final version of a new rule for GHG emissions, referred to as the Tailoring Rule. The rule states that new or modified sources that already are subject to New Source Review requirements for other pollutants will be required to also meet these requirements for GHGs if they increase emissions by more than 75,000 tons of CO_2e annually. Then on July 1, 2011, the requirements will apply to new sources that emit at least 100,000 tons of CO_2e annually and to major modifications of existing sources emitting 75,000 tons of CO_2e annually, even if they do not meet the threshold new source review requirements for other pollutants. In July 2012, the requirements will begin applying Title V operating permit requirements to existing sources not currently covered by Title V if they emit 100,000 tons of CO_2e annually. In regulating these GHG emissions, USEPA has developed guidelines for states to use in determining what would satisfy requirements as "best available control technology" as part of new source review of major modifications or new sources.

GHG and Fuel Efficiency Standards for Passenger Cars and Light-Duty Trucks. In April 2010, USEPA and NHTSA finalized GHG standards for new (model year 2012 through 2016) passenger cars, light-duty trucks, and medium-duty passenger vehicles. Under these standards, CO_2 emission limits would decrease from 295 grams per mile (g/mi) in 2012 to 250 g/mi in 2016 for a combined fleet of cars and light trucks. If all of the necessary emission reductions were made from fuel economy improvements, then the standards would correspond to a combined fuel economy of 30.1 miles per gallon (mpg) in 2012 and 35.5 mpg in 2016. The agencies issued a joint Final Rule for a coordinated National Program for model years 2017 to 202 5 light-duty vehicles on August 28, 2012, that would correspond to a combined fuel economy of 36.6 mpg in 2017 and 54.5 mpg in 2025.

GHG and Fuel Efficiency Standards for Medium-and Heavy-Duty Engines and Vehicles. In October 2010, the USEPA and NHTSA announced a program to reduce GHG emissions and to improve fuel efficiency for medium-and heavy-duty vehicles (model years 2014 through 2018). These standards were signed into law on August 9, 2011. The two agencies' complementary standards form a new Heavy-Duty National Program that has the potential to reduce GHG emissions by 270 million metric tons and to reduce oil consumption by 530 million barrels over the life of the affected vehicles.

Additional Stationary Source Rules. As a consequence of the decision in *Massachusetts v. Environmental Protection Agency*, USEPA entered into a December 2010 judicial settlement ending a long-running lawsuit seeking the inclusion of GHGs under the New Source Performance Standards (NSPS) provisions of the CAA. USEPA committed to promulgating NSPS for GHGs for power plants and refineries. NSPS are technology-based standards for both new and existing sources which apply to specific categories of stationary sources.

State

California's Energy Efficiency Standards for Residential and Nonresidential Buildings. Located in Title 24, Part 6 of the CCR and commonly referred to as "Title 24," these energy efficiency standards were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The goal of Title 24 energy standards is the reduction of energy use. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.[11] On May 31, 2012, the California Energy Commission (CEC) adopted the 2013 Building and Energy Efficiency Standards. Buildings that are constructed in accordance with the 2013 Building and Energy Efficiency Standards are 25 percent (residential) to 30 percent (nonresidential) more energy efficient than the 2008 standards as a result of better windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption in home and businesses.

Executive Order (E.O.) S-3-05. On June 1, 2005, E.O. S-3-05 set the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels. The E.O. establishes State GHG emission targets of 1990 levels by 2020 (the same as Assembly Bill [AB] 32) and 80 percent below 1990 levels by 2050. It calls for the Secretary of California Environmental Protection Agency (Cal/EPA) to be responsible for coordination of State agencies and progress reporting. A recent CEC Report concludes, however, that the primary strategies to achieve this target should be major "decarbonization" of electricity supplies and fuels, and major improvements in energy efficiency.

In response to the E.O., the Secretary of the Cal/EPA created the Climate Action Team (CAT). California's CAT originated as a coordinating council organized by the Secretary for Environmental Protection. It included the Secretaries of the Natural Resources Agency, the Department of Food and Agriculture, and the Chairs of the Air Resources Board, Energy Commission, and Public Utilities Commission. The original council was an informal collaboration between the agencies to develop potential mechanisms for reductions in GHG emissions in the State. The council was given formal recognition in E.O. S-3-05 and became the CAT.

The original mandate for the CAT was to develop proposed measures to meet the emission reduction targets set forth in the executive order. The CAT has since expanded and currently has members from 18 State agencies and departments. The CAT also has ten working groups, which coordinate policies among their members. The working groups and their major areas of focus are as follows:

- *Agriculture:* Focusing on opportunities for agriculture to reduce GHG emissions through efficiency improvements and alternative energy projects, while adapting agricultural systems to climate change
- *Biodiversity:* Designing policies to protect species and natural habitats from the effects of climate change

[11] CEC, California's Energy Efficiency Standards for Residential and Nonresidential Buildings, *Title 24, Part 6, of the California Code of Regulations*.

- *Energy:* Reducing GHG emissions through extensive energy efficiency policies and renewable energy generation
- *Forestry:* Coupling GHG mitigation efforts with climate change adaptation related to forest preservation and resilience, waste to energy programs and forest offset protocols
- *Land Use and Infrastructure:* Linking land use and infrastructure planning to efforts to reduce GHG from vehicles and adaptation to changing climatic conditions
- *Oceans and Coastal:* Evaluating the effects sea level rise and changes in coastal storm patterns on human and natural systems in California
- *Public Health:* Evaluating the effects of GHG mitigation policies on public health and adapting public health systems to cope with changing climatic conditions
- *Research:* Coordinating research concerning impacts of and responses to climate change in California
- *State Government:* Evaluating and implementing strategies to reduce GHG emissions resulting from State government operations
- *Water:* Reducing GHG impacts associated with the State's water systems and exploring strategies to protect water distribution and flood protection infrastructure

Assembly Bill 32 (AB 32). In September 2006, the California Global Warming Solutions Act of 2006, also known as AB 32, was signed into law. AB 32 focuses on reducing GHG emissions in California and requires the California Air Resources Board (CARB) to adopt rules and regulations that would achieve GHG emissions equivalent to Statewide levels in 1990 by 2020. The CARB initially determined that the total Statewide aggregated GHG 1990 emissions level and 2020 emissions limit was 427 million metric tons of CO_2e. The 2020 target reduction was estimated to be 174 million metric tons of CO_2e.

To achieve the goal, AB 32 mandates that CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce Statewide GHG emissions from stationary sources, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. Because the intent of AB 32 is to limit 2020 emissions to the equivalent of 1990, it is expected that the regulations would affect many existing sources of GHG emissions and not just new general development projects. Senate Bill 1368, a companion bill to AB 32, requires the California Public Utilities Commission and the CEC to establish GHG emission performance standards for the generation of electricity. These standards will also apply to power that is generated outside of California and imported into the State.

AB 32 charges CARB with the responsibility to monitor and regulate sources of GHG emissions in order to reduce those emissions. On June 1, 2007, CARB adopted three discrete early action measures to reduce GHG emissions. These measures involved complying with a low carbon fuel standard, reducing refrigerant loss from motor vehicle air conditioning maintenance, and increasing methane capture from landfills.[12] On October 25, 2007, CARB tripled the set of previously approved early action measures. The approved measures include improving truck efficiency (i.e., reducing aerodynamic drag), electrifying port equipment, reducing PFCs emissions from the semiconductor industry, reducing propellants in consumer products, promoting proper tire inflation in vehicles, and reducing SF_6 emissions from the non-electricity sector.

The CARB AB 32 Scoping Plan (Scoping Plan) contains the main strategies to achieve the 2020 emissions cap. The Scoping Plan was developed by CARB with input from the CAT and proposes a comprehensive set of actions designed to reduce overall carbon emissions in

[12] CARB, Proposed Early Action Measures to Mitigate Climate Change in California, April 20, 2007.

California, improve the environment, reduce oil dependency, diversify energy sources, and enhance public health while creating new jobs and improving the State economy. The GHG reduction strategies contained in the Scoping Plan include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. Key approaches for reducing GHG emissions to 1990 levels by 2020 include the following:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a Statewide renewable electricity standard of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout the State, and pursuing policies and incentives to achieve those targets; and
- Adopting and implementing measures to reduce transportation sector emissions.

CARB has adopted the First Update to the Climate Change Scoping Plan.[13] This update identifies the next steps for California's leadership on climate change. The first update to the initial AB 32 Scoping Plan describes progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities for the next several years. It also frames activities and issues facing the State as it develops an integrated framework for achieving both air quality and climate goals in California beyond 2020. Specifically, the update covers a range of topics, including the following:

- An update of the latest scientific findings related to climate change and its impacts, including short-lived climate pollutants.
- A review of progress-to-date, including an update of Scoping Plan measures and other State, federal, and local efforts to reduce GHG emissions in California.
- Potential technologically feasible and cost-effective actions to further reduce GHG emissions by 2020.
- Recommendations for establishing a mid-term emissions limit that aligns with the State's long-term goal of an emissions limit 80 percent below 1990 levels by 2050.
- Sector-specific discussions covering issues, technologies, needs, and ongoing State activities to significantly reduce emissions throughout California's economy through 2050.

As discussed above, in December 2007, CARB approved a total statewide GHG 1990 emissions level and 2020 emissions limit of 427 million metric tons of CO_2e. As part of the update, CARB revised the 2020 Statewide limit to 431 million metric tons of CO_2e, an approximately 1 percent increase from the original estimate. The 2020 business-as-usual (BAU) forecast in the update is 509 million metric tons of CO_2e. The State would need to reduce those emissions by 15 percent to meet the 431 million metric tons of CO_2e 2020 limit.

Senate Bill (SB) 375. SB 375, adopted in September 30, 2008, provides a means for achieving AB 32 goals through the reduction in emissions by cars and light trucks. SB 375 requires Regional Transportation Plans (RTP) prepared by metropolitan planning organizations (MPOs) to include Sustainable Communities Strategies (SCS). In adopting SB 375, the Legislature found that improved coordination between land use planning and transportation planning is needed in order to achieve the GHG emissions reduction target of AB 32. Further, the staff analysis for the bill prepared for the Senate Transportation and Housing Committee's August

[13]CARB, First Update to the Climate Change Scoping Plan: Building on the Framework, May 2014.

29, 2008 hearing on SB 375 stated that the bill would help implement AB 32 by aligning planning for housing, land use, transportation and GHG emissions for the 17 MPOs in the state.

Senate Bill (SB) 743. SB 743, adopted September 27, 2013, encourages land use and transportation planning decisions and investments that reduce vehicle miles traveled that contribute to GHG emissions, as required by AB 32. Key provisions of SB 743 include reforming aesthetics and parking CEQA analysis for urban infill projects and eliminating the measurement of auto delay, including level of service (LOS), as a metric that can be used for measuring traffic impacts in transit priority areas. SB 743 requires the State Office of Planning and Research (OPR) to develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects within transit priority areas that promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. It also allows OPR to develop alternative metrics outside of transit priority areas.

California Green Building Code. The California Green Building Code, referred to as CALGreen, is the first Statewide green building code. It was developed to provide a consistent, approach for green building within California. CALGreen lays out minimum requirements for newly constructed buildings in California, which will reduce greenhouse gas emissions through improved efficiency and process improvements. It requires builders to install plumbing that cuts indoor water use by as much as 20 percent, to divert 50 percent of construction waste from landfills to recycling, and to use low-pollutant paints, carpets, and floors.

CEQA Guidelines Amendments. SB 97 required the Governor's OPR to develop CEQA Guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions." The CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. Noteworthy revisions to the CEQA Guidelines include the following:

- Lead agencies should quantify all relevant GHG emissions and consider the full range of project features that may increase or decrease GHG emissions as compared to the existing setting;
- Consistency with the CARB Scoping Plan is not a sufficient basis to determine that a project's GHG emissions would not be cumulatively considerable;
- A lead agency may appropriately look to thresholds developed by other public agencies, including the CARB's recommended CEQA thresholds;
- To qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project. General compliance with a plan, by itself, is not mitigation;
- The effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis; and
- Given that impacts resulting from GHG emissions are cumulative, significant advantages may result from analyzing such impacts on a programmatic level. If analyzed properly, later projects may tier, incorporate by reference, or otherwise rely on the programmatic analysis.

California Air Resources Board (CARB) Guidance. CARB published draft guidance for setting interim GHG significance thresholds (October 24, 2008). The guidance does not attempt to address every type of project that may be subject to CEQA but, instead, focuses on common project types that are responsible for substantial GHG emissions, such as industrial, residential, and commercial projects. CARB believes that thresholds in these important sectors will advance climate objectives, streamline project review, and encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the State.

California Air Pollution Control Officers Association (CAPCOA). CAPCOA is a non-profit association of the air pollution control officers from all 35 local air quality agencies throughout California. CAPCOA promotes unity and efficiency in State air quality issues, and strives to encourage consistency in methods and practices of air pollution control. In 2008, CAPCOA published the *CEQA and Climate Change White Paper*.[14] This paper is intended to serve as a resource for reviewing GHG emissions from projects under CEQA. It considers the application of thresholds and offers approaches toward determining whether GHG emissions are significant. The paper also evaluates tools and methodologies for estimating impacts, and summarizes mitigation measures.

Regional

Southern California Association of Governments (SCAG) 2012-2035 Regional Transportation Plan/ Sustainable Communities Strategy (RTP/SCS). While Southern California is a leader in reducing emissions, and ambient levels of air pollutants are improving, the SCAG region continues to have the worst air quality in the nation. SCAG completed the RTP/SCS, which includes a strong commitment to reduce emissions from transportation sources to comply with SB 375. Goals and policies included in the RTP/SCS to reduce air pollution consist of adding density in proximity to transit stations, mixed-use development and encouraging active transportation (i.e., non-motorized transportation such as bicycling). SCAG promotes the following policies and actions related to active transportation to help the region confront congestion and mobility issues and consequently improve air quality:

- Implement Transportation Demand Management (TDM) strategies including integrating bicycling through folding bikes on buses programs, triple racks on buses, and dedicated racks on light and heavy rail vehicles;
- Encourage and support local jurisdictions to develop "Active Transportation Plans" for their jurisdiction if they do not already have one;
- Expand Compass Blueprint program to support member cities in the development of bicycle plans;
- Expand the Toolbox Tuesday's program to encourage local jurisdictions to direct enforcement agencies to focus on bicycling and walking safety to reduce multimodal conflicts;
- Support local advocacy groups and bicycle-related businesses to provide bicycle-safety curricula to the general public;
- Encourage children, including those with disabilities, to walk and bicycle to school;
- Encourage local jurisdictions to adopt and implement the proposed SCAG Regional Bikeway Network; and
- Support local jurisdictions to connect all of the cities within the SCAG region via bicycle facilities.

South Coast Air Quality Management District (SCAQMD). The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the Air Quality Management Plan (AQMP). In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy.

SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds. In its October 2008 document, the SCAQMD proposed the use of a percent emission reduction target

[14]California Air Pollution Control Officers Association (CAPCOA), *CEQA and Climate Change White Paper*, January 2008.

(e.g., 30 percent) to determine significance for commercial/residential projects that emit greater than 3,000 metric tons per year. On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for stationary source/industrial projects where the SCAQMD is the lead agency. However, SCAQMD has yet to adopt a GHG significance threshold for land use development projects (e.g., residential/commercial projects) and has formed a GHG Significance Threshold Working Group to further evaluate potential GHG significance thresholds.

SCAQMD has convened a GHG CEQA Significance Threshold Working Group to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. Members of the working group include government agencies implementing CEQA and representatives from various stakeholder groups that will provide input to the SCAQMD staff on developing CEQA GHG Significance Thresholds. The working group is currently discussing multiple methodologies for determining project significance. These methodologies include categorical exemptions, consistency with regional GHG budgets in approved plans, a numerical threshold, performance standards, and emissions offsets.

Local

On May 15, 2007, Los Angeles Mayor Antonio Villaraigosa released the "GREEN LA – An Action Plan to Lead the Nation in Fighting Global Warming" (GREEN LA Plan) that has an overall goal of reducing the City of Los Angeles' GHG emissions by 35 percent below 1990 levels by 2030. This goal exceeds the targets set by both California and the Kyoto Protocol, and is the greatest reduction target of any large United States City. The cornerstone of the GREEN LA Plan is increasing the City's use of renewable energy to 35 percent by 2020. Key strategies listed in the GREEN LA Plan related to energy and water includes the following:

Green the Power from the Largest Municipal Utility in the United States

- Meet the goal to increase renewable energy from solar, wind, biomass, and geothermal sources to 20 percent by 2010;
- Increase use of renewable energy to 35 percent by 2020;
- Let contracts for power imports from coal-fired power plants expire;
- Increase the efficiency of natural gas-fired power plants; and
- Increase biogas co-firing of natural gas-fired power plants.

Make Los Angeles a Worldwide Leader in Green Buildings

- By July 2007, present a comprehensive set of green building policies to guide and support private sector development;
- Transform Los Angeles Into the Model of an Energy Efficient City; and
- Reduce energy use by all city departments to the maximum extent feasible.

Complete energy efficiency retrofits of all city-owned buildings to meet a 20 percent or more reduction in energy consumption

- Install the equivalent of 50 "cool roofs" per year by 2010 on new or remodeled city buildings;
- Install solar heating for all city-owned swimming pools;
- Improve energy efficiency at drinking water treatment and distribution facilities; and
- Maximize energy efficiency of wastewater treatment equipment.

Help Angelenos Be "Energy Misers"

- Distribute 2 compact fluorescent light (CFL) bulbs to each of the 1.4 million households in the City;

- Increase the level and types of customer rebates for energy efficient appliances, windows, lighting, and heating and cooling systems;
- Increase the distribution of energy efficient refrigerators to qualified customers; and
- Create a fund to "acquire" energy savings as a resource from Los Angeles Department of Water and Power (LADWP) customers.

EXISTING GREENHOUSE GAS EMISSIONS

The primary effect of rising global concentrations of atmospheric GHG levels is a rise in the average global temperature of approximately 0.2 degrees Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling using 2000 emission rates shows that further warming is likely to occur given the expected rise in global atmospheric GHG concentrations from innumerable sources of GHG emissions worldwide, which would induce further changes in the global climate system during the current century.[15] Adverse impacts from global climate change worldwide and in California include:

- Declining sea ice and mountain snow peak levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in atmospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;[16]
- Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets;[17]
- Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;[18]
- Declining Sierra Mountains snowpack levels, which account for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years;[19]
- Increasing the number of days conducive to ozone formation (e.g., clear days with intense sun light) by 25 to 85 percent (depending on the future temperature scenario) in high O_3 areas located in the Southern California area and the San Joaquin Valley by the end of the 21st Century;[20] and
- Increasing the potential for erosion of California's coastlines and seawater intrusion into the Sacramento Delta and associated levee systems due to the rise in sea level.[21]

Scientific understanding of the fundamental processes responsible for global climate change has improved over the past decade. However, there remain significant scientific uncertainties, for example, in predictions of local effects of climate change, occurrence of extreme weather events, and effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the climate system, the uncertainty surrounding the implications of climate change may never be completely eliminated. Because of these uncertainties, there continues to be significant debate as to the

15 USEPA, *Draft Endangerment Finding*, 74 Federal Regulations 18886, 18904, April 24, 2009.
16 Ibid.
17 IPCC, Climate Change, 2007.
18 IPCC, Climate Change, 2007.
19 Cal/EPA, Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature, 2006.
20 Ibid.
21 Ibid.

extent to which increased concentrations of GHGs have caused or will cause climate change, and with respect to the appropriate actions to limit and/or respond to climate change. In addition, it may not be possible to link specific development projects to future specific climate change impacts, though estimating project-specific impacts is possible.

California is the fifteenth largest emitter of GHG on the planet, representing about two percent of the worldwide emissions.[22] **Table III.E-2** shows the California GHG emissions inventory for years 2003 to 2012. Statewide GHG emissions slightly decreased in 2009 due to a noticeable drop in on-road transportation, electricity generation, and industrial emissions.

TABLE III.E-2
CALIFORNIA GREENHOUSE GAS EMISSIONS INVENTORY

Sector	CO2e Emissions (Million Metric Tons)									
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Transportation	184	187	189	189	189	178	171	170	168	167
Electric Power	113	115	108	105	114	120	101	90	88	95
Commercial and Residential	42	43	41	42	42	42	43	44	44	42
Industrial	93	94	92	90	87	88	85	89	88	89
Recycling and Waste	8	8	8	8	8	8	8	8	8	8
Agriculture	37	36	37	38	37	38	36	36	36	38
High Global Warming Potential	9	10	10	11	12	13	14	16	17	18
Emissions Total	**486**	**493**	**485**	**483**	**489**	**487**	**458**	**453**	**449**	**457**

SOURCE: CARB, *California Greenhouse Gas Inventory 2003-2012*, August 1, 2013.

In 2012, total GHG and per capita emissions increased for the first time, albeit only by a single percentage point, in the last five years. This increase was driven primarily by strong economic growth in the state, the unexpected closure of the San Onofre Nuclear Generating Station, and drought conditions that limited in-state hydropower.

California's gross emissions of GHG decreased by 1.6 percent from 466.3 million metric tons of CO_2e in 2000 to 458.7 million in 2012, with a maximum of 492.7 million metric tons in 2004. During the same period, California's population grew by 11 percent from 34 to 37.8 million people. As a result, California's per capita GHG emissions have generally decreased over the last 12 years from 13.7 in 2000 to 12.1 metric tons of CO_2e per person in 2012.

Emissions from sectors other than electricity remained relatively constant from 2011, and the GHG carbon intensity of California's economy continued to decline in 2012. Beginning in 2013, California's Cap-and-Trade program will ensure that emissions continually decline, even alongside stronger economic growth and potentially drier hydrological conditions, and in the event of any additional unforeseen circumstances.

[22] CARB, Climate Change Scoping Plan, December 2008.

ENVIRONMENTAL IMPACTS

METHODOLOGY

GHG emissions were estimated for BAU and proposed project scenarios. BAU included emissions that would occur if the project were to be built without Project Design Features, such as solar energy generation. BAU included implementation of 2008 Building Energy Standards, which were used by CARB to establish the AB 32 reduction goals. The proposed project analysis includes implementation of 2013 Building Energy Standards, as required by Title 24 regulations. The following analysis of GHG emissions does not initially include Project Design Features (PDF) until the after PDF/mitigation discussion. For purposes of this analysis they are included in the after PDF/mitigation analysis in order to illustrate the substantial reduction in emissions. In addition, these PDFs would be monitored along with the mitigation measures.

The analysis considered the following sources of GHG emissions:

- Construction activities;
- Residential and non-residential building energy use;
- Non-building energy use (e.g., parking lights);
- Automobiles;
- Water cycle energy use;
- Solid waste energy use; and
- Landscaping maintenance.

Construction Activities. Construction emissions were estimated using the California Emissions Estimator Model (CalEEMod). CalEEMod is a Statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential pollutant missions associated with both construction and operational from a variety of land use projects. The model quantifies direct emissions from construction and operation (including vehicle use), as well as indirect emissions, such as emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Construction assumptions used in the CalEEMod analysis include:

Phase 1: Demolition

- Duration: 4 weeks
- Demolition Amount: 170,500 cubic feet of debris

Phase 2: Grading/Site Preparation

- Duration: 4 weeks
- Full-time Operating Equipment: 5

Phase 3: Construction

- Duration: 148 weeks
- Full-time Operating Equipment: 9

Phase 4: Asphalt Paving

- Duration: 4 weeks
- Total Operating Equipment: 6

Phase 5: Agricultural Coating

- Duration: 148 weeks
- Total Operating Equipment: 1

Construction emissions would be related to equipment exhaust, truck trips, and worker commute. In accordance with South Coast Air Quality Management District (SCAQMD) guidance, emissions have been amortized over 30 years to obtain annual emissions.

Residential Building, Non-Residential Building, and Non-Building Energy Use. Emissions related to residential and non-residential building energy use were estimated by Brummitt Energy Associates Inc.[23] BAU emissions were estimated using 2008 Building Energy Standards, which were used by CARB to establish the AB 32 reduction goals. Proposed project emissions were estimated using 2013 Building Energy Standards, as required by Title 24. Electricity and natural gas emission rates were obtained from the Rapid Fire Model used by Calthorpe Associates in the RTP/SCS. It was estimated that electricity use would generate 0.706 pounds of CO_2e per kilowatt-hour, and natural gas use would generate 11.7 pounds of CO_2e per therm. BAU assumptions are detailed in the Brummitt Energy Associates Inc. analysis, and include variables related to walls, roofs, floors, foundation, windows, skylights, cooling, lighting, site lighting, and hot water heating.

Automobiles. Vehicle miles traveled (VMT) were estimated by Overland Traffic Consultants, Inc. and Crain & Associates. Trip generation was based on the Institute of Transportation Engineers *Multi-Use Development Trip Generation and Internal Capture* guidance. It was estimated that BAU would generate a daily VMT of 62,291. Automobile emissions were estimated using the VMT and emission factors from EMFAC2011.

Water Cycle Energy Use. Electricity intensity factors associated with treatment of water were obtained from a water and energy use study published by the California Energy Commission.[24] The electricity intensity factors are reported in units of kilowatt-hours per million gallons of water used, and represent the amount of electricity needed to supply and convey the water from the source, treat the water to usable standards, and distribute the water to individual users.

Solid Waste Energy Use. GHG Emissions related to the solid waste were estimated using CalEEMod, which quantifies the GHG emissions associated with the decomposition of the waste which generates methane based on the total amount of degradable organic carbon. CalEEMod also quantifies CO_2 emissions associated with the combustion of methane. The default landfill gas concentrations were used as reported in accordance with USEPA AP-42 methodology.

Landscaping Maintenance. The emissions due to landscaping maintenance were calculating using CalEEMod with default options. The emission factors that CalEEMod uses for the landscaping equipment such as lawn mowers, roto tillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers, as well as air compressors, generators, and pumps are derived from the EMFAC2011 and also from the CARB's Technical Memo: Change in Population and Activity Factors for Lawn and Garden Equipment.[25]

[23] Brummit Energy Associates, MGA Campus Building Greenhouse Gas Emissions Summary, August 16, 2014.
[24] CEC, Refining Estimates of Water-Related Energy Use in California, December 2006.
[25] CARB, OFFROAD Modeling Change Technical Memo: Change in Population and Activity Factors for Lawn and Garden Equipment, June 13, 2003.

CalEEMod uses the square footage of the non-residential building and the number of residential units to derive two emission factors. The first emission factor is for the commercial landscape equipment which is in terms of grams per square foot of non-residential building space per day, and the second emission factor is for the residential landscape equipment which is in terms of grams per dwelling unit per day. These emission factors were then multiplied by the number of summer days or winter days that represent the number of operational days. It was assumed non-residential (e.g., commercial land uses) landscaping equipment would likely only operate during the week (not weekends) so operational days are 250 days per year.

Wastewater Treatment. Wastewater (or sewage) treatment can occur one of three ways - aerobically, in septic tanks or in facultative lagoons. In CalEEMod, the following defaults for sewage treatment options were used: Septic Tank (10.3 percent), Aerobic (87.5 percent), and Facultative (2.2 percent). Solids produced from primary treatment, aerobic processes, or facultative lagoons are typically digested in anaerobic digesters. The gas produced by these digesters may be flared or burned in some other simple device, or sent to a cogeneration process for heat recovery and/or electrical generation. The GHGs emitted from each type of wastewater treatment are based on the CARB's Local Government Operations Protocol, which are in turn based on USEPA methodologies, and are taken into account by CalEEMod.[26]

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would have a significant impact if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

- Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Until the passage of California Global Warming Solutions Act of 2006 (AB 32), CEQA documents generally did not evaluate GHG emissions or impacts on global climate change attributable to proposed actions. The primary focus of air pollutant analysis in CEQA documents was the emission of criteria pollutants, or those identified in the State and federal Clean Air Acts as being of most concern to the public and government agencies. With the passage of AB 32 and SB 97, a more detailed analysis of GHG emissions is recommended in CEQA documents; however, the analysis of GHGs is different from the analysis of criteria pollutants. Since the half-life of CO_2 is 100 years, GHGs affect the global climate over a relatively long time period. Conversely, for criteria pollutants, significance thresholds are based on daily emissions and the determination of attainment or nonattainment is based on the daily exceedance of applicable ambient air quality standards (e.g., 1-hour and 8-hour exposures).

CAPCOA has identified a number of potential approaches for determining the significance of GHG emissions in CEQA documents. In the CEQA *and Climate Change White Paper*, CAPCOA suggests making significance determinations on a case-by-case basis when no significance thresholds have been formally adopted by a lead agency.[27] One of the potential approaches identified in the CAPCOA White Paper requires a project to meet a percent reduction target (Threshold 1.1). This target was proposed to be based on the average reduction from BAU

[26] CARB, Local Government Operations Protocol. Chapter 10: Wastewater Treatment Facilities, 2008.
[27] CAPCOA, CEQA and Climate Change White Paper, January 2008.

emissions identified by CARB as necessary to satisfy the AB 32 mandate of returning to 1990 levels of GHG emissions by 2020.

OPR has recognized that CEQA guidelines have not been adopted to provide guidance as to how climate change is to be addressed under CEQA. OPR also notes that it is continuing to consult with the CARB regarding appropriate thresholds of significance to use for climate change analysis (but that such guidance is not yet available). The following "informal guidance" regarding the following steps for addressing climate change impacts under CEQA: (1) identify and quantify the GHG emissions; (2) assess the significance of the impact on climate change; and (3) if significant, identify alternatives and/or mitigation measures that will reduce impacts below significance.[28]

Although project-specific GHG emissions can be calculated, neither the SCAQMD nor the City of Los Angeles have established any programmatic or project-level significance thresholds for GHG emissions. At this time, GHGs (primarily CO_2) are not regulated as a criteria pollutant and there are no broadly recognized significance criteria for these emissions. Similarly, the 2012 AQMP does not set forth CEQA targets that can be used to determine any potential threshold values for GHG emissions.

Due to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, it is speculative to identify the specific impact, if any, to global climate change from one project's incremental increase in global GHG emissions. Pending the establishment of Statewide thresholds of significance for GHG emissions, the Lead Agency has elected to evaluate significance on a case-by-case basis. Because a single project's GHGs emissions to affect global climate change is highly speculative, significance analysis is more properly assessed on a cumulative basis. Assessing the significance of a project's contribution to cumulative global climate change involves: (1) determining an inventory of the project's GHG emissions; and (2) considering project consistency with applicable emission reduction strategies and goals, such as those set forth by AB 32.

As discussed above, in December 2007, CARB approved a total Statewide GHG 1990 emissions level and 2020 emissions limit of 427 million metric tons of CO_2e. CARB revised the 2020 Statewide limit to 431 million metric tons of CO_2e, an approximately 1 percent increase from the original estimate.[29] The 2020 BAU forecast in the update is 509 million metric tons of CO_2e. The State would need to reduce those emissions by 15.3 percent to meet the 431 million metric tons of CO_2e 2020 limit.

Based on the foregoing, in addition to the two Appendix G thresholds, the proposed project would normally be judged to produce a significant or potentially significant effect to GHGs and global climate change if activities were to:

- Impede the State's ability to achieve the reduction to 1990 levels in GHG emissions required by California Global Warming Solutions Act of 2006 (AB 32). An impediment to GHG reduction goals of AB 32 would occur if emissions would not achieve a 15.3 percent BAU reduction goal.

[28] California Office of Planning and Research, *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act Review,* June 2008.

[29] CARB, *First Update to the Climate Change Scoping Plan: Building on the Framework*, May 2014.

CONSTRUCTION AND OPERATIONAL IMPACTS

One of the objectives of the project is to, "provide a sustainable development consistent with the principles of smart growth and LEED standards including sustainable design features, renewable energy, mixed uses, LID stormwater controls and other features." Key components of project design (Project Design Features) that would reduce GHG emissions are: mixed-use, energy efficiency, use of solar power, Transportation Demand Management and project shuttle service.

The project would incorporate solar power in the design (on the roof of the MGA building) that would result in the project meeting some of the on-site demand for energy through renewable power that would reduce the demand for power from non-renewable sources. As discussed above, transportation is a major source of GHG emissions. The project would address reductions in transportation-related GHG emissions through a mix of uses that would reduce trips and trip lengths. For example, it is anticipated that some workers would live on-site and some on-site residents and workers would make use of on-site facilities (day care, restaurants, and other services). In addition, the project includes a circulating shuttle that would be available to residents and workers alike that would connect to nearby transit stations and work centers. These components are integral parts of the project design that address the project objective to be sustainable, and would serve to substantially reduce GHG emissions consistent with applicable plans and polices.

GHG emissions were estimated for BAU and proposed project scenarios. As discussed above under methodology, BAU emissions were based on 2008 Building Energy Standards, which were used by CARB to establish the AB 32 reduction goals.

Table III.E-3 presents emissions for BAU and emissions for the proposed project including compliance with 2013 Building Energy Standards, but not including Project Design Features that would substantially reduce GHG emissions.

The proposed project without Project Design Features would generate 5.0 percent fewer emissions than BAU under the future plus project scenario. The reduction would result from the implementation of 2013 Building Energy Standards. The 5.0 percent GHG reduction would not meet the 15.3 percent BAU requirement necessary to achieve AB 32 mandates.

Without Project Design Features that reduce GHG emissions, the proposed project would result in a significant impact related to GHG emissions and consistency with GHG reduction plans.

TABLE III.E-3
ESTIMATED GHG EMISSIONS – WITHOUT PROJECT DESIGN FEATURES

Source	Carbon Dioxide Equivalent (Metric Tons Per Year)		
	BAU	MGA Mixed-Use Campus without PDF that reduce GHG	Percent Difference
FUTURE WITH PROJECT CONDITIONS (2019)			
ONE-TIME EMISSIONS			
Construction	145	145	0%
BUILDOUT EMISSIONS			
Non-Residential Energy	1,595	1,389	13%
Residential Energy	2,134	1,785	16%
Non-Building Energy (e.g., Parking Lights)	497	282	43%
Water Cycle Energy	645	645	0%
Solid Waste Energy	261	261	0%
Mobile Sources	10,202	10,202	0%
Landscaping Maintenance	12	12	0%
TOTAL	15,491	14,721	5.0%

SOURCE: Brummit Energy Associates, *MGA Campus Building Greenhouse Gas Emissions Summary*, August 16, 2014; TAHA, 2014.

PROJECT DESIGN FEATURES

As detailed in **Section III.K Transportation and Circulation**, the project includes project design features (**PDF-III.K-2** and **PDF-III.K-3**) to reduce trips (project shuttles and Transportation Demand Management). These features were considered in the above analysis and would also reduce GHG emissions. While they are integral components of the project, they would be monitored as mitigation measures to ensure that they are fully implemented and are as effective as anticipated.

PDF-III.E-1 The proposed project shall reduce its energy usage by implementing Project Design Features that would include, at a minimum, the following measures, or equivalent measures capable of achieving the same results:

- Installation of energy efficient heating and cooling systems, equipment, and control systems.
- Installation of efficient lighting and lighting control systems.
- Installation of light colored "cool" roofs to more effectively reflect the sun's energy from the roof's surface to reduce the roof surface temperature, and use of shade structures such as awnings or canopies around soundstages and mills to reduce the heat island effect.
- Incorporation of energy saving features into building design, as appropriate (e.g., use of passive controls, shading, solar energy, ventilation, appropriate building materials, etc.).
- Prohibition of HVAC, refrigeration, and fire suppression equipment that contains banned chlorofluorocarbons.
- Use of Energy Star appliances.

- Use of photovoltaic technology.

REGULATORY COMPLIANCE MEASURES

RC-III.E-1 The proposed project shall comply with 2013 Building Energy Standards, as required by Title 24 regulations.

MITIGATION MEASURES

No mitigation measures are required.

LEVEL OF SIGNIFICANCE AFTER PROJECT DESIGN FEATURES/MITIGATION

PDF-III.E-1 would reduce energy use beyond 2013 Building Energy Standards through the implementation of high-efficiency equipment and systems. These include high efficiency water-cooled centrifugal chillers, primary-variable chilled-hot water pumping, and variable speed heating hot water pumping. The project would also include solar panels, which would generate approximately 236,250 kilowatt-hours per year of electricity. The Brummitt Energy Associates Inc. analysis includes a detailed comparison of the Project Design Features that would reduce energy use from BAU (e.g., photovoltaic cells and more efficient cooling systems).[30] It is estimated that the proposed project would result in the use of 9,272,126 kilowatt-hours per year of electricity and 91,653 therms per year of electricity. The electricity use is a 20 percent reduction from BAU, and the natural gas use is a 5.3 percent reduction from BAU.

As addressed in detail in **III.K, Transportation and Circulation**, project design features **PDF-III.K-1** and **PDF.III.K-2** include project shuttles and a Transit Demand Management Program that would reduce VMT, by encouraging bicycle, pedestrian and transit use by including pedestrian and bicycle amenities in the project, and through strategic parking fees. It is estimated that the BAU and proposed project scenarios would generate a daily VMT of 69,942. After implementation of the project shuttles and the Transit Demand Management Program, the proposed project would generate a daily VMT of 56,261, an approximately 20 percent reduction below BAU.

Table III.E-4 presents GHG emissions for BAU and the project with design features that reduce GHG. The project would generate 18.3 percent fewer emissions than BAU, which would exceed the 15.3 percent BAU reduction to achieve AB 32 mandates. Therefore, the project is considered to result in a less-than-significant impact related to GHG emissions and consistency with GHG reduction plans

[30]Brummit Energy Associates, *MGA Campus Building Greenhouse Gas Emissions Summary,* August 16, 2014.

TABLE III.E-4
ESTIMATED GHG EMISSIONS – WITH PROJECT DESIGN FEATURES

Source	Carbon Dioxide Equivalent (Metric Tons Per Year)		
	BAU	MGA Mixed-Use Campus with PDF that reduce GHG	Percent Difference
FUTURE WITH PROJECT CONDITIONS (2019)			
ONE-TIME EMISSIONS			
Construction	145	145	19.6%
BUILDOUT EMISSIONS			
Non-Residential Energy	1,595	1,389	13%
Residential Energy	2,134	1,785	16%
Non-Building Energy (e.g., Parking Lights)	497	282	43%
Water Cycle Energy	645	645	0%
Solid Waste Energy	261	261	0%
Mobile Sources	10,202	8,207	20%
Landscaping Maintenance	12	12	0%
Solar Panels	-	(76)	-
TOTAL	15,491	12,650	18.3%

SOURCE: Brummit Energy Associates, *MGA Campus Building Greenhouse Gas Emissions Summary*, August 16, 2014; TAHA, 2014.

CUMULATIVE IMPACTS

Because no single project is large enough to result in a measurable increase in global concentrations of GHG emissions, climate change impacts of a project are considered on a cumulative basis. The analysis presented above is also applicable to the cumulative analysis. As concluded in previous section, the proposed project would not meet the Statewide GHG reduction goals without implementation of Project Design Features and/or mitigation measures. However, after implementation of Project Design Features and Mitigation Measures, the proposed project would not contribute to a cumulatively considerable GHG impact.