

## 4.6 GREENHOUSE GAS EMISSIONS

This section analyzes the impacts associated with implementation of the proposed project on greenhouse gas (GHG) emissions and climate change. Modeling data can be found in Appendix E of this EIR.

### 4.6.1 ENVIRONMENTAL SETTING

#### GREENHOUSE GASES

The natural process through which heat is retained in the troposphere is called the “greenhouse effect.”<sup>1</sup> The greenhouse effect traps heat in the troposphere through a three-fold process, summarized as follows: short-wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long-wave radiation; and, GHGs in the upper atmosphere absorb this long-wave radiation and emit this long-wave radiation into space and toward the Earth. This “trapping” of the long-wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The most abundant GHGs are water vapor and carbon dioxide. Many other trace gases have greater ability to absorb and re-radiate long-wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential for each GHG based on its ability to absorb and re-radiate long-wave radiation.

GHGs include, but are not limited to, the following:<sup>2</sup>

- *Water Vapor (H<sub>2</sub>O)*. Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively.

The primary human-related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a Global Warming Potential (GWP) for water vapor.

- *Carbon Dioxide (CO<sub>2</sub>)*. Carbon dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, the concentration of CO<sub>2</sub> in the atmosphere has increased 36 percent.<sup>3</sup> Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.
- *Methane (CH<sub>4</sub>)*. Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management and leaks in natural gas pipelines. In the

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<sup>1</sup> The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

<sup>2</sup> All Global Warming Potentials are given as 100-year Global Warming Potential. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. (Intergovernmental Panel on Climate Change, *Climate Change, The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*, 1996).

<sup>3</sup> United States Environmental Protection Agency, Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2009, April 2011.

United States, the top three sources of methane are landfills, natural gas systems and enteric fermentation. Methane is the primary component of natural gas, which is used for space and water heating, steam production and power generation. The GWP of CH<sub>4</sub> is 21.

- Nitrous Oxide (N<sub>2</sub>O). Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production and nitric acid production. The GWP of N<sub>2</sub>O is 310.
- Hydrofluorocarbons (HFCs). HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 11,700 for HFC-23.<sup>4</sup>
- Perfluorocarbons (PFCs). Primary aluminum production and semiconductor manufacturing are the largest known man-made sources of two perfluorocarbons (PFCs): tetrafluoromethane (CF<sub>4</sub>) and hexafluoroethane (C<sub>2</sub>F<sub>6</sub>). Perfluorocarbons are potent GHGs with a GWP several thousand times that of CO<sub>2</sub>, depending on the specific PFC. PFCs are also relatively minor substitutes for ozone-depleting substances. The estimated atmospheric lifetimes for CF<sub>4</sub> and C<sub>2</sub>F<sub>6</sub> are 50,000 and 10,000 years, respectively. The GWPs of CF<sub>4</sub> and C<sub>2</sub>F<sub>6</sub> emissions are approximately 6,500 and 9,200, respectively.<sup>5</sup>
- Sulfur hexafluoride (SF<sub>6</sub>). Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride is the most potent GHG that has been evaluated by the IPCC with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to CO<sub>2</sub> (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm], respectively).<sup>6</sup>

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric ozone (O<sub>3</sub>) depleters; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- Hydrochlorofluorocarbons (HCFCs). HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The GWPs of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b.<sup>7</sup>

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<sup>4</sup> United States Environmental Protection Agency, *High GWP Gases and Climate Change*, June 14, 2012. <http://epa.gov/climatechange/ghgemissions/gases/fgases.html>, accessed on November 29, 2012.

<sup>5</sup> Ibid.

<sup>6</sup> Ibid.

<sup>7</sup> United States Environmental Protection Agency, *Protection of Stratospheric Ozone: Listing of Global Warming Potential for Ozone Depleting Substances*, dated October 29, 2009. <http://www.epa.gov/EPA-AIR/1996/January/Day-19/pr-372.html>, accessed on November 29, 2012.

- 1,1,1 trichloroethane. 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 110 times that of CO<sub>2</sub>.<sup>8</sup>
- Chlorofluorocarbons (CFCs). CFCs are used as refrigerants, cleaning solvents, and aerosol spray propellants. CFCs were also part of the EPA's Final Rule (57 FR 3374) for the phase out of O<sub>3</sub> depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from 4,000 for CFC 11 to 14,000 for CFC 13.<sup>9</sup>

## 4.6.2 REGULATORY SETTING

### FEDERAL

The Federal Clean Air Act (FCAA) requires the United States Environmental Protection Agency (EPA) to define national ambient air quality standards (NAAQS) to protect public health and welfare in the United States. The FCAA does not specifically regulate GHG emissions; however, on April 2, 2007 the U.S. Supreme Court in *Massachusetts v. U.S. Environmental Protection Agency*, determined that GHGs are pollutants that can be regulated under the FCAA. The EPA adopted an endangerment finding and cause or contribute finding for GHGs on December 7, 2009. Under the endangerment finding, the Administrator found that the current and projected atmospheric concentrations of the six, key, well-mixed GHGs (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, and SF<sub>6</sub>) threaten the public health and welfare of current and future generations. Under the cause or contribute finding, the Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Based on these findings, on April 1, 2010, the EPA finalized the light-duty vehicle rule controlling GHG emissions. This rule confirmed that January 2, 2011, is the earliest date that a 2012 model year vehicle meeting these rule requirements may be sold in the United States. On May 13, 2010, the EPA issued the final GHG Tailoring Rule. This rule set thresholds for GHG emissions that define when permits under the Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. Implementation of the federal rules is expected to reduce the level of emissions from new motor vehicles and large stationary sources.

### STATE

#### California Global Climate Change Regulatory Programs

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is occurring, and there is a real potential for severe adverse environmental, social and economic effects in the long term. Every nation emits GHGs and, as a result, makes an incremental cumulative

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<sup>8</sup> Ibid.

<sup>9</sup> United States Environmental Protection Agency, *Class I Ozone Depleting Substances*, August 19, 2010. <http://www.epa.gov/ozone/ods.html>, accessed on November 29, 2012.

contribution to global climate change; therefore, global cooperation will be required to reduce the rate of GHG emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

Executive Order S-1-07. Executive Order S-1-07 proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least ten percent by 2020. This order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in Assembly Bill 32.

Executive Order S-3-05. Executive Order S-3-05 set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- 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 Executive Order directed the secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources and mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the secretary of Cal/EPA created the California Climate Action Team (CAT), made up of members from various state agencies and commissions. The CAT released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through state incentive and regulatory programs.

Executive Order S-13-08. Executive Order S-13-08 seeks to enhance California's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of the State of California's first climate adaptation strategy. This will result in consistent guidance from experts on how to address climate change impacts in the State of California.

Executive Order S-14-08. Executive Order S-14-08 expands the State's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. CARB adopted the "Renewable Electricity Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

Executive Order S-20-04. Executive Order S-20-04, the California Green Building Initiative (signed into law on December 14, 2004), establishes a goal of reducing energy use in state-owned buildings by 20 percent from a 2003 baseline by 2015. It also encourages the private commercial sector to set the same goal. The initiative places the California Energy Commission (CEC) in charge of developing a building efficiency benchmarking system, commissioning and retro-commissioning (commissioning for existing commercial buildings) guidelines, and developing and refining building energy efficiency standards under Title 24 to meet this goal.

Executive Order S-21-09. Executive Order S-21-09, 33 percent Renewable Energy for California, directs CARB to adopt regulations to increase California's Renewable Portfolio

Standard (RPS) to 33 percent by 2020. This builds upon SB 1078 (2002) which established the California RPS program, requiring 20 percent renewable energy by 2017, and SB 107 (2006) which advanced the 20 percent deadline to 2010, a goal which was expanded to 33 percent by 2020 in the 2005 Energy Action Plan II.

Assembly Bill 32 (California Global Warming Solutions Act of 2006). California passed the California Global Warming Solutions Act of 2006 (AB 32; *California Health and Safety Code* Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

Assembly Bill 1493. AB 1493 (also known as the Pavley Bill) requires that CARB develop and adopt, by January 1, 2005, regulations that achieve “the maximum feasible reduction of GHG emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State.”

To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004 by adding GHG emissions standards to California’s existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 and adoption of 13 CCR Section 1961.1 require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty weight classes for passenger vehicles (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily to transport people), beginning with the 2009 model year. Emissions limits are reduced further in each model year through 2016. When fully phased in, the near-term standards will result in a reduction of about 22 percent in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term standards will result in a reduction of about 30 percent.

Assembly Bill 3018. AB 3018 established the Green Collar Jobs Council (GCJC) under the California Workforce Investment Board (CWIB). The GCJC will develop a comprehensive approach to address California’s emerging workforce needs associated with the emerging green economy. This bill will ignite the development of job training programs in the clean and green technology sectors.

Senate Bill 97. SB 97, signed in August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the Governor’s Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions (or the effects of GHG emissions), as required by CEQA.

OPR published a technical advisory recommending that CEQA lead agencies make a good-faith effort to estimate the quantity of GHG emissions that would be generated by a proposed project. Specifically, based on available information, CEQA lead agencies should estimate the emissions associated with project-related vehicular traffic, energy consumption, water usage and construction activities to determine whether project-level or cumulative impacts could occur, and should mitigate the impacts where feasible. OPR requested CARB technical staff to recommend a method for setting CEQA thresholds of significance as described in *CEQA*

*Guidelines* Section 15064.7 that will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the State.

The Natural Resources Agency adopted the CEQA Guidelines Amendments prepared by OPR, as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the CEQA Guidelines Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The CEQA Guidelines Amendments became effective on March 18, 2010.

Senate Bill 375. SB 375, signed in September 2008 (Chapter 728, Statutes of 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 alternative planning strategy (APS) that will prescribe land use allocation in that MPOs regional transportation plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets.

Senate Bills 1078 and 107. SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

Senate Bill 1368. SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed into law in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007. SB 1368 also required the CEC to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas-fired plant. Furthermore, the legislation states that all electricity provided to California, including imported electricity, must be generated by plants that meet the standards set by CPUC and CEC.

CARB Scoping Plan. On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. CARB's Scoping Plan contains the main strategies California will implement to reduce CO<sub>2</sub>eq emissions by 174 million metric tons (MT), or approximately 30 percent, from the State's projected 2020 emissions level of 596 million MT CO<sub>2</sub>eq<sup>10</sup> under a business as usual (BAU)<sup>11</sup> scenario. This is a reduction of 42 million MT CO<sub>2</sub>eq, or almost ten percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.

CARB's Scoping Plan calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions

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<sup>10</sup> Carbon Dioxide Equivalent (CO<sub>2</sub>eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

<sup>11</sup> "Business as Usual" refers to emissions that would be expected to occur in the absence of GHG reductions. See <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>. Note that there is significant controversy as to what BAU means. In determining the GHG 2020 limit, CARB used the above as the "definition." It is broad enough to allow for design features to be counted as reductions.

estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 2004 to forecast emissions to 2020. At the time CARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

In *Association of Irrigated Residents v. California Air Resources Board*, the Superior Court of California for the County of San Francisco (Superior Court) issued a "tentative statement of decision" (Tentative Decision) that prevents CARB from implementing a statewide GHG regulatory program under AB 32 until the agency complies with the requirements of CEQA. The Tentative Decision partially grants a petition for a writ of mandate brought by a coalition of environmental justice organizations (Petitioners) that alleged that CARB's Scoping Plan violated both AB 32 and CEQA. Although the Superior Court denied all claims related to AB 32, the court found that CARB: 1) failed to adequately discuss and analyze the impacts of alternatives in its proposed Scoping Plan as required by its CEQA implementing regulations; and 2) improperly approved the Scoping Plan prior to completing the environmental review required by CEQA. In upholding the Petitioners' challenge on these two CEQA issues, the Superior Court issued a Peremptory Writ of Mandate and enjoined CARB from further implementation of the Scoping Plan until it complies with all CEQA requirements. Parties to the case had 15 days from the issuance of the Tentative Decision to file objections before the Superior Court issued a final decision in the case.

On March 18, 2011, the Superior Court issued its Final Statement of Decision, which is substantially similar to the Tentative Decision. The Superior Court ruled in favor of CARB concerning AB 32 mandates and how to best reach the GHG reduction goals set by AB 32. However, the Superior Court determined that CARB failed to conduct adequate CEQA review for the Scoping Plan. Specifically, the Superior Court concluded that CARB failed to consider adequate alternatives to the mix of measures adopted in the Scoping Plan, including especially alternatives to cap-and-trade measures, and that CARB improperly began implementing the Scoping Plan measures before its CEQA review process was complete. Therefore, the Superior Court has suspended any further implementation of the measures contained in the Scoping Plan until the State has complied with CEQA.

On June 19, 2012, the California First District Court of Appeal ruled in favor of CARB and upheld the Scoping Plan. The decision, which is now final, also found the Scoping Plan to be in compliance with AB 32. The Court determined the entirety of the Scoping Plan "reflects an exercise of sound judgment" and was not arbitrary or capricious. CARB began the cap-and-trade portion of the Scoping Plan on January 1, 2012, and the enforceable compliance obligation began on January 1, 2013.

### **Northern Sierra Air Quality Management District**

The project is under jurisdiction of the Northern Sierra Air Quality Management District (NSAQMD), which regulates air quality according to the standards established in the Clean Air Acts and amendments to those acts. The NSAQMD comprises three contiguous, mountainous, rural counties in northeastern California (Nevada, Sierra and Plumas counties) and regulates air quality through its permitting authority and through air quality related planning and review activities over most types of stationary emission sources.

The NSAQMD has not yet established significance thresholds for greenhouse gas emissions from project operations.

## LOCAL

### Nevada County General Plan

The Air Quality Element and the Circulation Element of the Nevada County General Plan includes several goals, objectives and policies with respect to GHG emissions and sustainability, including the following:

#### Air Quality Element

- Policy 14.2: Include the following as part of the Comprehensive Site Development Standards:
- a. Encourage maximized solar access, where feasible, and consistent with the maintenance of scenic values, in new subdivision designs to optimize energy efficiency.
  - b. Require all installations of solid fuel-burning devices comply with the current Federal EPA emission standards.
  - c. Require installation of masonry and zero-clearance fireplaces in new construction to comply with the current EPA Phase particulate emission limits.
- Policy 14.4: Encourage and cooperate with the Northern Sierra Air Quality Management District, or any successor agency, to:
- a. Work with the County, local public utility districts, other public agencies and the private sector to encourage the development and implementation of educational and incentive programs to encourage energy conservation, house weatherization, solar energy use in new and existing buildings, and provide air quality monitoring and advisory programs (e.g. daily standard air pollution index data).
  - b. Develop a community biomass program in cooperation with the Nevada County Department of Sanitation and existing homeowner associations, and provide incentives for composting, mulching, grinding, cogeneration, feedstocks, and chipping in-lieu of outdoor burning.
  - c. Adopt control measures to reduce pollutant emissions from open burning.
  - d. Develop a program to regulate and control fugitive dust emissions from construction projects.
  - e. Identify and establish visibility standards for air quality in the County.
- Policy 14.7: The County shall cooperate with all appropriate agencies and other regional transportation agencies that include surrounding counties to develop programs designed to maximize the participation of employers in employer-operated van pool and/or

ride sharing for employees, and mass transit service for both employees and customers.

### Circulation Element

- Goal RD-4.1: Reduce dependence on the automobile.
- Goal RD-4.2: Increase the availability of alternative modes of transportation.
- Goal RD-4.3: Decrease vehicle miles traveled while encouraging increased transit ridership and vehicle occupancy.
- Goal RD-4.4: Encourage land use patterns that reduce the need for new roadways and promote the use of alternative transportation modes.
- Policy RD-4.3.4: Minimize the need to commute by:
- a. Providing for an adequate amount of residential, commercial, and industrial designations in proper balance, as shown on the General Plan Land Use Maps; and
  - b. Encouraging Economic Development and Public Facility policies that support local employment opportunities.
- Goal EP-4.3: To the extent feasible, encourage the reduction of Greenhouse Gas emissions during the design phase of construction projects.
- Goal EP-4.4: To the extent feasible, encourage the development of energy efficient circulation patterns.

### Housing Element

- Goal EC-8.1 Provide for a variety of alternative housing options and the use of alternative, innovative, and appropriate technology.
- Goal EC-8.2: To the extent feasible, encourage the reduction of Greenhouse Gas Emissions during the design phase of construction projects.
- Policy EC-8.6.1: Encourage energy efficient site design in new land divisions, particularly in larger subdivisions and planned developments where there is sufficient area for alternate designs as follows:
- a. Encourage lot patterns that maximize proper solar orientation;
  - b. Utilize interconnected streets and traffic calming features to reduce fuel consumption and encourage walkability;
  - c. Provide adequate on-site usable open space and relate the type, amount and location of open space to the types of households expected to occupy the building;
  - d. Include in the project, or locate project within walking distance to (generally, one-quarter to one-half mile), needed amenities such as storage, laundry, community rooms, recycling, childcare facilities, and convenient shopping facilities.

- Policy EC-8.6.3: Promote infill within existing residential neighborhoods and intensify land uses consistent within existing neighborhood or commercial district patterns in developed areas currently served by municipal services.
- Policy EC-8.6.4: In addition to Title 24, Part 6 of the California Code of Regulations, the County shall promote energy efficiency and alternative energy sources for new and rehabilitated housing using incentives and site plan review recommendations, which shall include the following:
- a. Passive solar design to maximize solar energy capture.
  - b. Preservation of native trees that provide shade, reduce energy costs, and slow structural deterioration.
  - c. Incorporation of adequate deciduous tree cover on the south and west side of dwellings and along streets to help reduce the cooling demand during summer months and capture maximum solar energy in winter.
  - d. Maximization of use of daylight and energy-efficient lighting, such as compact fluorescent lighting indoors and LED lighting outdoors.
  - e. Energy-Star rated appliances, solar hot water heating systems, and other plumbing, mechanical, electrical, and solar permits issued for systems that either produce energy or save natural resources, such as wind-generated electrical systems, tankless water heaters, and highly efficient heating, ventilation and air conditioning systems.
  - f. Water conservation features, including reclamation; landscaping appropriate to the site's climate, soils, and water resources; and water-saving irrigation practices.
  - g. Solid waste reduction and recycling.
- Program EC-8.6.5: Adopt a solar access ordinance that establishes development standards for new development to protect the solar access of adjacent properties.
- Policy EC-8.6.5: Continue to strongly support the current housing weatherization programs and Energy Crisis Intervention Program within Nevada County.

### **City of Grass Valley 2020 General Plan**

The Land Use Element of the Grass Valley 2020 General Plan includes several goals and objectives with respect to sustainability and GHG emissions, including the following:

- Goal 2-LUG: Promote infill as an alternative to peripheral expansion where feasible.
- Objective 3-LUO: Reduction in the amount of land necessary to accommodate future growth.

Objective 4-LUO:	Reduction in environmental impacts associated with peripheral growth.
Objective 5-LUO:	Continued revitalization of central Grass Valley.
Goal 5-LUG	Provide for a broad range of housing opportunities, including opportunities for low, moderate and middle income households.
Objective 12- LUO:	Designation of residential building sites sufficient in number and variety to meet projected demand.
Objective 13-LUO:	Provision of sufficient affordable housing units for those working in Grass Valley.
Objective 14-LUO:	Utilization of available programs to promote the construction of affordable housing.
Goal 6-LUG:	Promote a jobs/housing balance within the Grass Valley region in order to facilitate pleasant, convenient and enjoyable working conditions for residents, including opportunities for short home to work journeys.
Objective 15-LUO:	Reduction in the number of vehicle miles driven.
Objective 16-LUO:	An improved quality of life for those working in the Grass Valley Planning Area.

### 4.6.3 ENVIRONMENTAL ANALYSIS

#### THRESHOLDS OF SIGNIFICANCE

According to Appendix G of the *CEQA Guidelines*, the proposed project would result in significant air quality impacts if it would:

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

#### POTENTIAL IMPACTS AND MITIGATION MEASURES

##### Greenhouse Gas Emissions

#### **4.6-1 GREENHOUSE GAS EMISSIONS GENERATED BY THE PROJECT WOULD NOT HAVE A SIGNIFICANT IMPACT ON THE ENVIRONMENT.**

**Level of Significance Before Mitigation:** Potentially Significant Impact

##### **Impact Analysis**

The proposed Housing Element Rezone Implementation Program anticipates the development of a maximum 2,675 housing units within the County. Implementation of the additional housing units is expected to result in increased GHG emissions; largely due to increased vehicle miles traveled (VMT), as well as from construction activities, area sources,

energy consumption, water supply and solid waste generation. Increased GHG emissions could contribute to global climate change patterns and the adverse global environmental effects thereof. GHG emissions associated with future developments include CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub>. Implementation of the additional housing units is not anticipated to generate other forms of GHG emissions in quantities that would facilitate a meaningful analysis.

**Project-Related Greenhouse Gas Emissions**

The “business as usual” GHG emissions that could occur as a result of implementation of the Housing Element Rezone (2,675 residential dwelling units) have been calculated. As previously stated, “business as usual” refers to emissions that would be expected to occur in the absence of GHG reduction measures. Implementation of the proposed Housing Element Rezone may also result in displacement of up to 840 dwelling units included in the existing Housing Element. Table 4.6-1, *Business As Usual Greenhouse Gas Emissions*, presents the estimated CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub> emissions associated with the existing/displaced uses, the proposed 2,675 residential dwelling units, as well as the net increase in GHG emissions. As noted in Table 4.6-1, the majority of GHG emissions are attributable to mobile sources. The total net “business as usual” GHG emissions that could occur as a result of implementation of the proposed Housing Element Rezone are 25,876.93 MTCO<sub>2</sub>eq/yr.

**Table 4.6.-1  
 Business As Usual Greenhouse Gas Emissions**

Source	CO <sub>2</sub>	CH <sub>4</sub>		N <sub>2</sub> O		Total Metric Tons of CO <sub>2</sub> eq <sup>3</sup>
	Metric Tons/yr <sup>1</sup>	Metric Tons/yr <sup>1</sup>	Metric Tons of CO <sub>2</sub> eq <sup>2</sup>	Metric Tons/yr <sup>1</sup>	Metric Tons of CO <sub>2</sub> eq <sup>2</sup>	
<b>Existing/Displaced GHG Emissions</b>						
Area Source	1,969.67	0.83	17.43	0.08	24.8	2,012.30
Energy	1,491.49	0.05	1.05	0.03	9.3	1,500.72
Mobile Source	13,242.2	0.04	0.84	0.03	9.3	13,256.47
Waste	78.44	4.64	96.34	0.00	0.00	174.78
Water Demand	121.90	1.68	35.28	0.04	12.4	170.58
<b>Total Emissions<sup>3</sup></b>	<b>17,115.85 MTCO<sub>2</sub>eq/yr</b>					
<b>Proposed Business As Usual GHG Emissions</b>						
Area Source	6,286.53	2.64	55.44	0.26	80.60	6,422.60
Energy	4,760.33	0.16	3.36	0.08	24.80	4,789.80
Mobile Source	30,641.90	1.57	32.97	0.00	0.00	30,674.91
Waste	250.34	14.79	310.59	0.00	0.00	561.03
Water Demand	389.05	5.35	112.35	0.14	43.40	544.44
<b>Total Project-Related Emissions<sup>3</sup></b>	<b>42,992.78 MTCO<sub>2</sub>eq/yr</b>					
<b>TOTAL NET GHG EMISSIONS</b>	<b>25,876.93 MTCO<sub>2</sub>eq/yr</b>					

Notes:

- 1 – Emissions calculated using CalEEMod computer model.
- 2 – CO<sub>2</sub> Equivalent values calculated using the U.S. EPA Website, *Greenhouse Gas Equivalencies Calculator*, <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>, accessed January 2013.
- 3 – Totals may be slightly off due to rounding.

Refer to Appendix E (Greenhouse Gas Emissions Data) for detailed model input/output data.

Due to the amount of development that could occur in the County with implementation of the Housing Element Rezone, it is anticipated that the sum of direct and indirect GHG emissions would conflict with the requirements of AB 32 to reduce statewide GHG emissions. However, it should be noted that the purpose of the project is to rezone property to accommodate the County’s Regional Housing Need Allocation in order to obtain certification

from the California Department of Housing and Community Development (HCD), pursuant to state law. Additionally, the County’s General Plan includes polices which inherently relate to the reduction of GHG emissions. General Plan Goal EC-8.2 encourages the reduction of GHG emissions. Policy EC-8.6.1 encourages energy efficiency site design and Policy EC-8.6.2 supports neighborhood serving retail to reduce vehicle miles traveled. General Plan Policy EC-8.6.4 promotes water conservation and recycling measures.

**Attorney General Recommended Measures**

The California Office of the Attorney General has established recommended measures for projects to reduce GHG emissions.<sup>12</sup> The proposed project would be consistent with the goals and policies of the County’s General Plan. The General Plan includes several goals and policies related to the reduction of GHG emissions. The California Attorney General’s recommendations comprehensively outline the various categories of reduction measures and provide a framework for the GHG analysis. It is noted that the measures are not necessarily exhaustive and are not utilized as thresholds. Table 4.6-2, *Project Consistency with the Attorney General’s Recommendations*, further describes how General Plan Policies would reduce future development’s GHG emissions.

**Table 4.6-2  
Project Consistency with the Attorney General’s Recommendations**

Attorney General’s Recommended Measures	Project Compliance
Smart growth, jobs/housing balance, transit-oriented development, and infill development through land use designations, incentives and fees, zoning, and public-private partnerships.	<b>Compliant.</b> Implementation of the Housing Element Rezone anticipates the development of additional dwelling units. General Plan Policy RD-4.3.3 promotes smart land use patterns to reduce the need to commute by providing for an adequate amount residential, commercial, and industrial designations in proper balance, which inherently results in reduced vehicle trips.
Create transit, bicycle, and pedestrian connections through planning, funding, development requirements, incentives and regional cooperation; create disincentives for auto use.	<b>Compliant.</b> General Plan Goals RD-4.1 through RD-4.4 would reduce dependence on the automobile, decrease vehicle miles traveled while encouraging transit ridership and vehicle occupancy, and encourage land use patterns that promote the use of alternative transportation. General Plan Policy 14.7 requires the County to cooperate with all appropriate agencies and other regional transportation agencies that include surrounding counties to develop programs designed to maximize the participation of employers in employer-operated van pool and/or ride sharing for employees, and mass transit service for both employees and customers.
Energy- and water-efficient buildings and landscaping through ordinances, development fees, incentives, project timing prioritization, and other implementing tools.	<b>Compliant.</b> General Plan Policy 14.2 requires the County to include energy efficiency standards as part of the Comprehensive Site Development Standards. These measures include maximized solar access to optimize energy efficiency. General Plan Policy 14.4 requires cooperation with the Northern Sierra Air Quality Management District to work with the County, local public utility districts, other public agencies and the private sector to encourage the development and implementation of educational and incentive programs to encourage energy conservation, house weatherization, solar energy use in new and existing buildings, and provide air quality monitoring and advisory programs. General Plan Policy EC-8.6.4 includes requirements for water conservation features including reclamation and efficient landscaping.

<sup>12</sup> California Office of the Attorney General, The California Environmental Quality Act Addressing Global Warming Impacts at the Local Agency Level, updated May 21, 2008.

**Table 4.6-2, continued**

Attorney General's Recommended Measures	Project Compliance
	Additionally Housing Element Program EC-8.6.5 requires the adoption of a solar access ordinance that establishes development standards to protect and maximize solar access in all new residential development. Goal EC-8.1 encourages the innovative design of all land divisions that assist in the development of low- and moderate-cost housing and energy efficient housing. Policy EC-8.6.5 supports the current housing weatherization programs and Energy Crisis Intervention Program within Nevada County. Policy EC-8.6.1 also includes incentives to promote alternative energy sources.
Waste diversion, recycling, water efficiency, energy efficiency and energy recovery in cooperation with public services districts and private entities.	<b>Compliant.</b> General Plan Policy 3.2.4 requires the County to continue to implement the County Integrated Waste Management Plan, which requires recycling in accordance with State law. Additionally, Policy EC-8.6.4 includes requirements for site plan review which ensure that projects include solid waste reduction and recycling.
Urban and rural forestry through tree planting requirements and programs; preservation of agricultural land and resources that sequester carbon; heat island reduction programs.	<b>Compliant.</b> General Plan Policy 13.2 includes requirements to minimize the removal of trees and existing vegetation. Individual trees or groups of trees are required to be protected during construction to prevent damage to the trees and their root systems. Policy 13.3 requires landscaping with native trees and shrubs
Regional cooperation to find cross-regional efficiencies in GHG reduction investments and to plan for regional transit, energy generation, and waste recovery facilities.	<b>Compliant.</b> Refer to responses above.

Source: California Office of the Attorney General, *Sustainability and General Plans: Examples of Policies to Address Climate Change*, updated January 22, 2010.

## Conclusion

The County's process for the evaluation of discretionary projects includes environmental review and documentation pursuant to CEQA, as well as analysis of those projects for consistency with the goals, policies and recommendations of the General Plan. In general, implementation of the policies in the General Plan, as well as compliance with federal, state, and local regulations would avoid or reduce their incremental contribution to the significant worldwide increase in GHG emissions. However, for some projects, it is possible that adherence to General Plan policies may not adequately avoid or reduce incremental impacts, and such projects would require additional mitigation measures. For each future discretionary project requiring mitigation (i.e., measures that go beyond what is required by existing programs, plans, and regulations), project-specific measures would be identified with the goal of reducing incremental project-level impacts to less than significant, or the incremental contributions of a project may remain significant and unavoidable where no feasible mitigation exists. Where mitigation is determined necessary and feasible, these measures would be included in a Mitigation Monitoring and Reporting Program for the project. The measures may be updated, expanded and refined when applied to specific future projects based on project specific design and changes in existing conditions, and local, state, and federal laws.

It should be noted that the emissions modeled in Table 4.6-1 are for the aggregate total of 18 candidate sites assuming the maximum development potential. Additionally, one of the site selection criteria was the proximity to local services. The project would also increase density. Both the increase in density and proximity to local services would have lower VMT than less dense development, thereby reducing vehicle emissions. Environmental review of future projects within the candidate sites as part of the Housing Element Rezone Implementation

Program may require additional project-specific mitigation to reduce project impacts to less than significant levels. Due to the substantial amount of development that would be accommodated by the proposed Housing Element Rezone, GHG emissions would be significant and unavoidable.

Although implementation of General Plan policies would reduce project-related GHG emissions, GHG reductions as a result of these policies have not been quantified. Currently, there are no specific development proposals associated with the proposed Housing Element Rezone. Therefore, the degree and extent of future project compliance with the General Plan policies and implementation measures is not yet known and the project details necessary to calculate emission reductions are not available at this time. Future development associated with implementation of the Housing Element Rezone would need to be analyzed on a project-by-project basis to determine the extent of each project's potential contribution to global climate change and appropriate mitigation measures specific to each project. Thus, at this stage of analysis, GHG impacts associated with implementation of the Housing Element Rezone would be significant and unavoidable.

**General Plan Goals and Policies:** Refer to General Plan Goals RD-4.1 through RD-4.4, EP-4.3, EP-4.4, and EC-8.2, and Policies RD-4.3.4, 14.2, 14.4, and 14.7.

**Mitigation Measures:** No additional mitigation has been identified.

**Level of Significance After Mitigation:** Significant and Unavoidable Impact

**Consistency with Applicable GHG Plans, Policies, or Regulations**

#### **4.6-2 IMPLEMENTATION OF THE PROPOSED PROJECT WOULD NOT CONFLICT WITH AN APPLICABLE GREENHOUSE GAS REDUCTION PLAN, POLICY, OR REGULATION.**

**Level of Significance Before Mitigation:** Less Than Significant Impact

#### **Impact Analysis**

The County does not currently have an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Therefore, the proposed project would not conflict with an adopted plan, policy, or regulation pertaining to GHGs. However, the Nevada County General Plan includes Goals EP-4.3, EP-4.4 and EC-8.2, which require the reduction of GHG emissions. Additionally, Program EC-8.6.8 within the Housing Element prioritizes funding for affordable housing for projects that provide cost-effective energy efficiency measures that exceed state standards and reduce GHG emissions, such as the use of recycled and green building materials. The future development of 2,675 dwelling units would be required to comply with the applicable measures of the General Plan. Thus, a less than significant impact would occur in this regard.

**General Plan Goals and Policies:** Refer to General Plan Goals RD-4.1 through RD-4.4, EP-4.3, EP-4.4, and EC-8.2, and Policies RD-4.3.4, 14.2, 14.4, and 14.7, and Program EC-8.6.8.

**Mitigation Measures:** No additional mitigation has been identified.

**Level of Significance After Mitigation:** Less Than Significant

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