4.10 CLIMATE CHANGE

INTRODUCTION

The Climate Change section of the EIR describes the potential impacts of the Wildhorse Ranch project related to greenhouse gas emissions and climate change. The chapter includes a discussion of the potential impacts of these emissions on both local and regional scales, and mitigation measures warranted to reduce any identified significant impacts to the extent feasible. The Climate Change section is based primarily on an air quality analysis conducted by Raney Planning & Management, Inc. using URBEMIS-2007 (Version 9.2.4) air quality modeling software. The results of the URBEMIS-2007 analysis are included in Appendix D of this Draft EIR. In addition, information for this section was drawn from *Carbon Development Allowances, Final Report*[1] prepared by Deb Niemeier, Ph.D., P.E. for the City of Davis and the *City of Davis General Plan*.[2]

EXISTING ENVIRONMENTAL SETTING

The following setting information provides an overview of the existing air quality in the Wildhorse Ranch area, located in the City of Davis in Yolo County. In addition, the regulatory agencies and required permits associated with air quality are described.

Greenhouse Gas Emissions & Climate Change

Greenhouse gases (GHGs) are those that trap heat in the atmosphere. Greenhouse gases are emitted by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without natural GHGs, scientists estimate that the Earth's surface would be approximately 61 degrees Fahrenheit cooler.[3] However, scientists also believe that the combustion of fossil fuels (coal, petroleum, natural gas, etc.) for human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond naturally occurring concentrations. The increase in atmospheric concentrations of GHG has resulted in more heat being held within the atmosphere, which is the accepted explanation for global climate change (GCC).

According to the United States Environmental Protection Agency (USEPA), the global warming potential of a gas, or aerosol, to trap heat in the atmosphere is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas." Common GHG components include water vapor, carbon dioxide (CO_2), methane, nitrous oxides, chlorofluorocarbons, hydro-fluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. Carbon dioxide is widely used as the reference gas for comparison of equivalent global warming potential. The CO_2 equivalent is a good way to assess emissions because the use of an equivalent gives weight to the global warming potential of the gas. Methane gas, for example, is estimated by the Association of Environmental Professionals

and the USEPA to have a comparative global warming potential 21 times greater than that of CO_2, as shown in Table 4.10-1.

Table 4.10-1
Global Warming Potentials and Atmospheric Lifetimes Of Select GHGs

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)
Carbon Dioxide	50-200	1
Methane	12 ± 3	21
Nitrous Oxide	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: Tetrafluoromethane (CF_4)	50,000	6,500
PFC: Hexafluoroethane (C_2F_6)	10,000	9,200
Sulfur Hexafluoride (SF_6)	3,200	23,900

Source: U.S. Environmental Protection Agency. 2006. Non CO_2 Gases Economic Analysis and Inventory. Global Warming Potentials and Atmospheric Lifetimes. Website http://www.epa.gov/nonco2/econ-inv/table.html. Accessed December 28, 2007.

At the extreme end of the scale, sulfur hexafluoride is estimated to have a comparative global warming potential 23,900 times that of CO_2. The "specified time horizon" is related to the atmospheric lifetimes of GHGs, which are estimated by the USEPA to vary from 50-200 years for CO_2, to 50,000 years for tetrafluoromethane. Longer atmospheric lifetimes allow GHG to buildup in the atmosphere; therefore, longer lifetimes correlate with the global warming potential of a gas.

One teragram (equal to one million metric tonnes) of CO_2 equivalent (Tg CO_2 Eq.) is defined by the USEPA as the emissions of the reference GHG multiplied by the equivalent global warming potential. In 2004, total worldwide GHG emissions were estimated to be 20,135 Tg of CO_2 equivalents, and the U.S. contributed the greatest percentage of worldwide GHG emissions (35 percent). In addition, in 2004, the USEPA estimated that GHG emissions in the U.S. were 7074.4 Tg of CO_2 equivalents, which is an increase of 15.8 percent from 1990 emissions. California is a substantial contributor of GHG as the State is the second largest contributor in the U.S. and the sixteenth largest in the world. In 2004, California is estimated to have produced seven percent of the total U.S. emissions. The major source of GHG in California is transportation, which contributes 41 percent of the State's total GHG emissions, followed by electricity generation, which contributes 22 percent of the State's GHG emissions.

Beginning in 1999, the City of Davis has been at the forefront of municipalities advocating for steps to reduce GHGs. In 2006, the City joined the US Conference of Mayors Climate Protection Agreement that called for local and national action to reduce GHG emissions; and in 2007 the City Council voted unanimously to adopt a strategy to reduce citywide emissions of GHGs. The Natural Resources Commission is currently developing an action plan and early action items to reduce GHG emissions.

Potential Global Changes

The Intergovernmental Panel on Climate Change (IPCC) *Climate Change 2007*[4] report indicates that the average global temperature is likely to increase between 3.6 and 8.1 degrees Fahrenheit by the year 2100, with larger increases possible but not likely. The increase in temperature is expected to lead to higher temperature extremes (hotter in summer and colder in winter), precipitation extremes resulting in both flooding from large individual storms and droughts from infrequent rain, ocean acidification from increased carbon content, and rising sea levels. Because the effects of warming are likely to include making dry areas drier, and rising sea levels may inundate coastal areas, subtropical and low-lying areas are expected to be the areas most affected by climate change.

Potential Changes in the Western United States and California Climate

Climate models indicate that if GHG emissions continue to proceed at a medium or high rate, temperatures in California are expected to increase by 4.7 to 10.5 degrees Fahrenheit by the end of the century.[5] Lower emission rates would reduce the projected warming to an increase of 3.0 to 5.6 degrees Fahrenheit. Almost all climate scenarios include a continuing trend of warming through the end of the century given the vast amounts of GHGs already released, and the difficulties associated with reducing emissions to a level that would stabilize the climate. According to the 2006 Climate Action Team Report,[6] the following climate change effects are predicted in California over the course of the next century:

- A diminishing Sierra snowpack declining by 70 percent to 90 percent, threatening the State's water supply;
- Increasing temperatures from eight to 10.4 degrees Fahrenheit, under the higher emission scenarios, leading to a 25 to 35 percent increase in the number of days ozone pollution levels are exceeded in most urban areas;
- Increased coastal erosion along the length of California and seawater intrusion into the Delta from a four to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions;
- Increased vulnerability of forests to forest fires due to pest infestation and increased temperatures;
- Increased challenges for the State's important agriculture industry from water shortages, increasing temperatures, and saltwater intrusion into the Delta; and
- Increased electricity demand, particularly in the hot summer months.

Therefore, temperature increases would lead to environmental impacts in a wide variety of areas including: reduced snowpack resulting in changes to the existing water resources, increased risk of wildfires, changing weather expectations for farmers and ranchers, and public health hazards associated with higher peak temperatures, heat waves, and decreased air quality.

Water Resources

Depending on the climate model, precipitation for temperate climates is expected to decrease with an increased potential for drought. Topographical and geographical factors will likely result

in substantial variation in the net change in precipitation. However, the form in which precipitation occurs is anticipated to change substantially. Warmer winters would lead to less snow and more rain. As a result, the Sierra snowpack would be reduced and would melt earlier. This change could lead to increased flood risks as more water flows into reservoirs and rivers during the winter rainy period. Furthermore, earlier melting of the snowpack would reduce late spring and summer flows to reservoirs, which combined with hotter, drier summers, could lead to water shortages and restricted water supplies for cities, agriculture, and rivers.

Increased temperatures would also lead to a rise in the sea level, from both thermal expansion and the melting of land-based glaciers. During the past century, sea levels along the California coast have risen by approximately seven inches. Climate forecasts indicate the sea level would rise by seven to 23 inches over the next 100 years depending on the climate model.[7] Substantial melting of either the Greenland or Antarctic ice sheets would lead to an even greater increase; however, the IPCC models do not indicate that this would occur within the next 100 years, which is the boundary of most climate models. Longer forecast periods are inherently less reliable as they require more assumptions, and tend to compound the effects of assumptions that may be incorrect. Substantial increases in sea level would lead to increased coastal flooding, salt water intrusion into aquifers, and disruption of wetlands and estuaries.

Wildfires

Increased temperatures would lead to increased evapotranspiration. The summers would likely be drier, and vegetation would also be more likely to dry out, resulting in increasingly more flammable forests and wildlands. In addition, warmer temperatures could lead to the expansion of pests that kill and weaken trees, leading to increases in the amount of highly flammable dead trees and increasing the risk of large forest fires.

Weather Extremes

As a result of GCC, the weather is expected to become more variable, with larger extremes. In California, the increase in temperatures is expected to lead to more days with temperatures in excess of 95 degrees. More days of extreme heat has implications for public health, as Californians would face greater risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. In addition, increased temperatures have implications for agricultural crops, particularly long-term crops such as grapes and fruit trees that are planted in particular locations to take advantage of micro-climates.

Air Quality

Increased temperatures create the conditions in which ozone formation can increase, which would lead to adverse impacts to air quality. In addition, hotter temperatures would likely result in increased electricity use to power air conditioners and refrigerators. Increased power use has the potential to result in increased air pollutant emissions, as more electrical generation is needed to meet the demand.

Uncertainty Regarding Global Climate Change

The scientific community has largely agreed that the earth is warming, and that humans are contributing to that change. However, the earth's climate is composed of many complex mechanisms including: ocean currents, cloud cover, and the jet-stream and other pressure/temperature weather guiding systems. These systems are in turn influenced by changes in ocean salinity, changes in the evapotranspiration of vegetation, the reflectivity (albedo) of groundcover, as well as numerous other factors. Some changes have the potential to reduce climate change, while others could form a feedback mechanism that would speed the warming process beyond what is currently projected. The climate system is inherently dynamic; however, the overall trend is toward a gradually warming planet.

Prediction of impacts to specific localities is not yet possible. Improvements to Global Climate Models have led to Regional Climate models. However, the accuracy of these models is limited. In particular, the weather patterns at a particular site are guided by micro-climates that include such influences as elevation, prevailing wind patterns, and humidity among many other factors. Therefore, potential impacts to the proposed project resulting from climate change are based on inferences out of climate models that provide generalized impacts for a large area.

REGULATORY CONTEXT

Regulation of air quality is achieved through both federal and State ambient air quality standards, and emission limits for individual sources of air pollutants.

Federal Regulations

The United States Environmental Protection Agency (USEPA) is charged with enforcing the Federal Clean Air Act (FCAA). The USEPA has established air quality standards for common pollutants. The USEPA has been directed to develop regulations to address the GHG emissions of cars and trucks. Currently, USEPA regulations for GHGs do not exist.

State Regulations

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493 (Stats. 2002, ch. 200) (Health & Safety Code, §§ 42823, 43018.5). AB 1493 requires that the CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty truck and other vehicles determined by the CARB to be vehicles whose primary use is noncommercial personal transportation in the state." Currently, the USEPA has denied the State's request for a waiver from the USEPA to begin regulation of GHG emissions from vehicles. The State of California has indicated that a suit will be filed in federal court.

Executive Order S-3-05

In 2005, Governor Schwarzenegger signed Executive Order S-3-05, which established total GHG emissions targets. Specifically, emissions are to be reduced to year 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below the 1990 levels by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary is also directed to submit biannual reports to the governor and State legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts.

To comply with the Executive Order, the Secretary of the CalEPA created a Climate Action Team (CAT) made up of members from various State agencies and commissions. The CAT released their first report in March 2006. In addition, the CAT has released several "white papers" addressing issues pertaining to the potential impacts of climate change on California.

Assembly Bill 32, The California Climate Solutions Act of 2006

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006 (Stats. 2006, ch. 488) (Health & Saf. Code, § 38500 et seq.). AB 32 requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. 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.

Senate Bill 1368

Senate Bill (SB) 1368 (Stats. 2006, ch. 598) (Pub. Util.Code, §§ 8340-8341) is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) established a similar standard for local publicly owned utilities on May 23, 2007. The standard prohibits publically owned utilities from entering long-term financial commitments with plants that exceed 1,100 pounds of CO2 per megawatt hour. On January 27, 2007, the PUC adopted an interim Greenhouse Gas Emissions Performance Standard to require that all new long-term commitments for baseload power generation to serve Californians do not exceed the emissions of a combined cycle gas turbine plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

Senate Bill 375

In September 2008, Governor Arnold Schwarzenegger signed SB 375, which is intended to build on AB 32 by attempting to control GHG emissions by curbing sprawl. SB 375 enhances CARB's ability to reach goals set by AB 32 by directing CARB to develop regional GHG emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. In addition, CARB will work with the State's 18 metropolitan planning organizations to align their regional transportation, housing, and land-use plans and prepare a "sustainable communities strategy" to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the region's ability to attain its GHG emission reduction targets. SB 375 provides incentives for creating walkable and sustainable communities and revitalizing existing communities, and allows home builders to get relief from certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Furthermore, SB 375 encourages the development of alternative transportation options, which will reduce traffic congestion.

Senate Bill 1078

SB 1078 establishes a renewable portfolio standard (RPS) for electricity supply. The RPS requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. This target date was moved forward by SB 107 to require compliance by 2010. In addition, electricity providers subject to the RPS must increase their renewable share by at least one percent each year. The outcome of this legislation will impact regional transportation powered by electricity.

Executive Order S-01-07

On January 18, 2007, Governor Schwarzenegger signed Executive Order S-01-07, which mandates that a statewide goal be established to reduce carbon intensity of California's transportation fuels by at least 10 percent by 2020. The Order also requires that a Low Carbon Fuel Standard for transportation fuels be established for California.

California Air Resources Board

The California Air Resources Board (CARB) is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for the California Clean Air Act (CCAA) adopted in 1988. The CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the National Ambient Air Quality Standards established by the USEPA. As discussed above, the CARB is also charged with developing rules and regulations to cap and reduce GHG emissions. The CARB has released a draft list of actions to be taken to reduce GHG emissions; however, the proposed actions are not specifically applicable to residential development.

The CARB regulates mobile emissions sources and oversees the activities of County Air Pollution Control Districts (APCDs) and regional Air Quality Management Districts (AQMDs).

The CARB regulates local air quality indirectly using State standards and vehicle emission standards, by conducting research activities, and through planning and coordinating activities.

Local Regulations

In 1999, the City of Davis adopted a resolution to participate in the Cities for Climate Protection Campaign and in April 2006, the City adopted a resolution endorsing the U.S. Mayor's Climate Protection Agreement, committing to strive to meet the Kyoto Protocol (an international agreement to address climate disruption) emission reduction targets of 7 percent below 1990 levels by 2012.

More recently, on November 18, 2008, the Davis City Council adopted Resolution No. 08-166, the purpose of which was to adopt GHG reduction targets for the City of Davis. As noted in Resolution No. 08-166, as part of the City's action in adopting the City's Climate Protection/Community Sustainability Framework Strategy in April 2007, the City Council directed staff to aggressively pursue actions to reduce the City's GHG emissions. The City's Climate Protection/Community Sustainability Framework Strategy included the following elements: 1) Assess the City's current programs and projects that support resource conservation and community sustainability; 2) Develop a short-term action plan to identify early action items to be implemented in less than 18 months; 3) Develop a mid-term action plan to implement multi-year projects that build on existing City programs/projects to achieve the City's climate protection and sustainability goals; 4) Initiate a visioning process to define a sustainable Davis that guides future decisions; and 5) Develop a related community outreach program to provide and gather information.

The adoption of GHG reduction targets for the City was based on the belief that significant long-term risks exist to the economy and the environment of the nation, the State, and the City from the temperature increases and climatic disruptions that are projected to result from increased GHG concentrations. The Climate Protection/Community Sustainability Framework Strategy and the GHG reduction targets are intended to reduce GHG emissions and increase energy efficiency by decreasing air pollution, creating jobs, reducing energy expenditures, and saving money for the City government, businesses, and citizens. As part of Resolution No. 08-166, the City adopted the GHG reduction targets for the Davis community and its own City operations, shown in Table 4.10-2.

City of Davis GHG Emissions Reduction Strategy

In April 2007, the City Council adopted a strategy to reduce local GHG emissions. To achieve this objective, the City joined the Cities for Climate Protection (CCP) program along with hundreds of other communities across the globe working to reduce GHG emissions at the local level. The CCP is a performance-oriented campaign that offers a framework for local governments to reduce GHG emissions and improve livability within their municipalities.

Table 4.10-2
City of Davis GHG Reduction Targets

Year	Target Range*		Notes
	State	Davis**	
2010	2000 levels	1990 levels	Minimum: State Target. Desired: Provides baselines for subsequent average annual reductions.
2012	1998 levels	7% below 1990 levels	Minimum: State does not establish target for this year; linear interpolation from 2010 target. Desired: Consistent with Kyoto – Mayors Climate Protection Agreement Pledge – City of Davis Resolution 2006.
2015	1995 levels	15% below 1990 levels	Minimum: State does not establish target for this year; linear interpolation from 2010 target. Desired: Consistent with initial ICLEI modeling conducted by the City
2015 to 2020	Average annual reduction	Average of 2.6% reduction/year to achieve 80% below 1990 levels by 2040	Minimum: State does not establish target for these years. Desired: Average reduction encourages monitoring of progress and some flexibility in implementation.
2020	1990 levels	28% below 1990 levels	Minimum: State Target. Desired: Average reduction encourages monitoring of progress and some flexibility in implementation.
2020-2040	No formal target, but must reduce an average of 2.6% per year to achieve 80% below 1990 by 2050	Average of 2.6% reduction/year to achieve 80% below 1990 levels	Minimum: State does not establish target for these years. Desired: Reduction level adopted by the state based on climate stabilization levels of 3 to 5.5 degree increase in temperature. Average reduction encourages monitoring of progress and some flexibility in implementation.
2050	80% below 1990 levels	Carbon Neutral	Minimum: State Target. Reduction level adopted by the state based on climate stabilization levels of 3 to 5.5 degree increase in temperature. Average reduction encourages monitoring of progress and some flexibility in implementation. Desired: Combination of actions at the local, regional, national, and international levels **and** carbon offsets. Similar to UC system, City of Berkeley, and Norway.

*It is anticipated that Davis will achieve reductions within the range of the state targets (minimum) and local targets (desired)
** Due to Residency time of GHG in the atmosphere, early GHG reduction is generally more beneficial for mitigation of the most severe impacts of climate change.

The CCP framework includes the following five steps:

1. Conduct a baseline emissions inventory and forecast;
2. Adopt an emissions reduction target for the forecast year;
3. Develop a Local Action Plan;
4. Implement policies and measures; and
5. Monitor and verify results.

GHG Emissions Inventory

The City has measured local GHG emissions using the ICLEI – Local Governments for Sustainability Clean Air and Climate Protection (CACP) software. The ICLEI model is the standard approach used by communities measuring local GHG emissions.

As part of the original effort to assemble the ICLEI inventory, staff recognized that there were gaps in the software that had the potential to significantly affect results. Specifically, the model did not capture vehicle (commute or other) miles occurring outside Davis. In order to improve the local GHG inventory and address this gap, the City's consultant worked with SACOG staff and traffic models to estimate commute miles associated with Davis residents and businesses. To calculate the approximate adjustment that should be made to include trips that may have some portion of their travel outside Davis, half of each commute trip (into and out of Davis) was included in the Davis GHG inventory.

Link with State GHG Inventory

As noted above, the City has used the standard model for establishing a local GHG emissions inventory. However, the CARB has also conducted a statewide inventory that is the basis for moving forward on State-mandated reduction targets and will be required to set regional targets under SB 375. The City of Davis determined that directly linking these two types of inventories is an important step if local jurisdictions are to show how their actions contribute to State GHG reduction targets.

In order to link the two inventories, the City identified the State inventory emissions sectors that occur in Davis (e.g. transportation, residential, commercial, etc.). Then, State emissions were calculated on a per capita basis and allocated to Yolo County and, finally, to Davis based on proportion of population. Based on the results of linking the two inventories, the per capita GHG emissions in Davis are approximately 30 percent lower than what the State inventory would predict. After accounting for the gap in the Davis inventory for travel outside the City, as discussed above, the difference is approximately 25 percent. A portion of the difference is believed to be due to the policies the City has pursued for the past several decades that serve to reduce local GHG emissions. However, some of the difference may be associated with the differences in the assumptions that are built into the State and ICLEI models. The City has proceeded with the best available information in setting GHG guidelines for new residential development projects; therefore, the guidelines proposed for the City are based on the statewide inventory to establish a per dwelling unit GHG "allowance" for City of Davis projects.

Revised GHG Emissions Reduction Targets

As part of the overall effort to establish a Climate Action Plan for the City, the City determined that the GHG reduction targets originally considered and passed by the Davis Natural Resources Commission (NRC) in April 2008 were the appropriate targets on which to base the City's reduction targets. The GHG reduction targets recommended by the NRC in April are shown below in Table 4.10-3.

Table 4.10-3
GHG Reduction Targets Recommended by the NRC

Year	Target	Notes
2012	7 percent below 1990 levels	Consistent with Kyoto – Mayor's Climate Protection Agreement Pledge – City of Davis Resolution (2006).
2015	15 percent below 1990 levels	Consistent with current ICLEI modeling conducted by the City. Due to residency time of GHG gases in the atmosphere, early GHG reduction is more beneficial for mitigation of most severe impacts.
2015-2040	Average of 2.6 percent reduction per year to achieve 80 percent below 1990 levels	Reduction level adopted by the State based on climate stabilization levels of 3.0 to 5.5 degree increase in temperature. Average reduction encourages monitoring of progress and some flexibility in implementation.
2050	Carbon neutral	Combination of actions at the local, regional, national, and international levels and carbon offsets. Similar to targets for the UC System, City of Berkeley, and Norway.

Source: City of Davis, City Council Staff Report, November 4, 2008.

The City determined that these aggressive reduction goals are important to frame the local discussion and to set an example for other communities to consider. In addition, early GHG reduction is beneficial in addressing climate change, due to residency times of GHGs in the atmosphere. However, after considering the implications of the revised inventory, the City determined that reaching these local targets would be very difficult and consideration of a revised target set aligned with State targets was warranted. Rather than abandon the more aggressive targets, the City has proposed a target range using the State targets as the minimum and the targets shown above as the desired reductions. This serves to remind the City of its leadership role, while also providing a higher likelihood that the City will achieve at least a minimum target. In addition, this approach serves to link the State inventory and targets with the local inventory and targets and recognizes the current debate over whether the State's targets will achieve climate stabilization levels in the lower range of predicted temperature increases.

As the inventory was examined and refined, the City reconsidered the likelihood that the desired near-term targets could be achieved. Based on this analysis, the City concluded the following: (1) the State targets presented considerable challenges for a local jurisdiction to achieve; and (2) the desired reduction levels shown in Table 4.10-3 would be very difficult to achieve without fundamental advances in technology and shifts in society that are outside the influence of the Davis community. Therefore, the City has recommended a range of targets that set a floor but aim much higher (See Table 4.10-2).

Analysis of potential GHG reduction actions is currently underway, and City staff, the Climate Action Team, and the Science Advisory Team will provide additional information on the practicality of the recommended targets. These targets will be reexamined as part of an adaptive management approach that takes updated information, changing policy, and advancements in technology into consideration.

Residential Carbon Allowances

The City's GHG inventory shows that more than 75 percent of the total GHG emissions generated in Davis are associated with the energy used in Davis homes and personal transportation associated with residential land uses (City of Davis GHG Inventory and Forecast Report, May 2008). Although some of the transportation GHG emissions are associated with the movement of goods, the majority are associated with personal transportation and are therefore linked with residential activities.

Due to the importance of the residential sector relative to GHG emissions, a methodology was developed to establish a GHG target (or "allowance") for individuals and, by extension, dwelling units. Establishing this allowance informs the City's efforts to reduce local GHG emissions in the following two ways: (1) with a simple calculation, the City can link GHG emissions from new residential development projects directly to local and State GHG reduction targets; and (2) targets are provided for existing residents. In short, this information allows the City to set GHG performance standards for new residential projects and helps educate existing residents about what role they play in reducing local GHG emissions.

The City has, therefore, established GHG allowances for the two residential sectors – new housing projects and existing residents. In order to meet the GHG emissions reduction targets shown in Table 4.10-2, it is clear that the energy used in Davis' existing housing stock and newly constructed residential units must be addressed. As noted above, more than 75 percent of the total GHG emissions generated in Davis are directly related to residential energy use and transportation. Working from the assumptions that every home built in Davis today will still be in existence in 2050 and that energy use associated with residential activities will continue to be the primary source of local direct and indirect GHG emissions, new residential units built in Davis must perform to meet future GHG reduction targets.

Working from these assumptions, the adjusted GHG inventory, and the proposed Davis GHG reduction targets, it was determined how residential units must perform for the City to meet the community reduction targets. The carbon "allowance" for new and existing residential units for sample reduction targets is summarized in Table 4.10-4, below.

By establishing these allowances, the City has the information necessary to develop standards, incentives, and tools to help the residential sector achieve its share of local, and State, GHG emissions reductions.

Table 4.10-4
Carbon Allowances

Target Year Minimum / Desired	Target	Carbon Allowance to Meet GHG Reduction Target (annual metric tonnes per dwelling unit and per person)	
		Residential Type	
		New	Existing
Existing / Base Year (2010)	N/A	20.25 per unit / 8.1 per person	20.25 per unit / 8.1 per person
2012 (minimum) 2012 (desired)	1998 level 7% below 1990	18.6 / 7.4 11.25 / 4.5	18.75 / 7.5 11.75 / 4.7
2020 (minimum) 2020 (desired)	1990 level 28% below 1990	12.0 / 4.8 8.75 / 3.5	12.75 / 5.1 9.25 / 3.7
2030 (minimum) 2030 (desired)	28% below 1990 53% below 1990	8.75 / 3.5 5.75 / 2.3	9.25 / 3.7 6.0 / 2.4
2040 (minimum) 2040 (desired)	53% below 1990 80% below 1990	5.75 / 2.3 2.5 / 1.0	6.0 / 2.4 2.5 / 1.0
2050 (minimum) 2050 (desired)	80% below 1990 Carbon neutral	2.5 / 1.0 Net 0	2.5 / 1.0 Net 0

* Assumes 2.5 persons per dwelling unit and an annual growth rate of 1% per year. (Source: City of Davis GHG Inventory and Forecast Report, May 2008).

Sources: City of Davis, City Council Staff Report, November 4, 2008; and Deb Niemeier, Ph.D., P.E., Carbon Development Allowances, Final Report, September 2008.

Existing Residential Dwelling Units

As a first step in achieving the long-term per-capita reduction goals, the City has initiated a public engagement program to raise citizen awareness and give existing residents a tool to achieve measurable GHG reduction savings at the household level. The voluntary Davis Low Carbon Diet Challenge pilot program was launched on October 12, 2008 with the goal of 100 households losing 5,000 lbs of carbon each over the course of a year. The City's goal is to learn from this pilot program and scale the program up in coming years to cover thousands of Davis households.

If the 100 households involved in the pilot program are successful, they will lose an average of 2.48 tons per household, which is approximately 25 percent of the way to the desired reduction for Davis residents by 2012 and 27 percent of the State's 2020 target.

As part of the City's planning process to develop a long-term climate action plan for the community, consideration is also being given to other incentive-based programs to assist existing residents (e.g., financing programs for energy efficiency upgrades and solar power). In addition, improvements to the transit system and changed land-use patterns are being considered with the objective of reducing automobile use which would lead to reductions in GHG emissions at the community level.

New Residential Projects

Staff is in the process of drafting initial guidelines for GHG reduction standards for new residential projects. The guidelines use the GHG inventory and allowances to set standards for new residential projects. The intent of the guidelines is to ensure that new residential projects move the City toward its long-term GHG reduction targets. The draft guidelines are currently in the early development stages.

Conclusion

The City recognizes that implementation of programs to reduce residential GHG emissions will require development of a set of standards, measures, and tools to educate and guide existing residents and developers of new residential projects. Establishment of the allowances is a critical first step, but it must be followed by programs that provide certainty and adequate flexibility to give developers and residents a viable chance of achieving the per-capita targets.

City of Davis Green Building Ordinance

Article 8.20 of the Davis Municipal Code provides green building guidelines for new development. Both the proposed single-family and multi-family buildings would be required to implement measures identified in the *Build it Green 2007 New Home and Multifamily Green Building Guidelines* (See Table 4.10-5). Measures could include exceeding energy efficiency standards, including water-efficient appliances and landscaping. Depending on the size of the single-family units, a total of 70 to 80 points would be required. The multi-family units would be required to achieve 70 points.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Although it is clear that emissions throughout the State must be reduced in order to meet reductions targets, none of the Air Districts in California have identified a significance threshold for GHG emissions, a methodology for making a finding, or a measuring tool to determine when mitigation reduces emissions "enough." The California Office of Planning and Research, the agency responsible for development and updates to the CEQA Guidelines, is not required to have a draft set of guidelines for climate change until July 1, 2009 (pursuant to Senate Bill 97, Chapter 185, 2007). One could use the emissions reduction targets established through AB 32; however, the measures listed in the published Proposed Scoping Plan (not yet adopted) do not clearly identify the reduction targets that will apply specifically to local government. The Proposed Scoping Plan states that local government should set the same ultimate targets as those set forth in AB 32, but does not provide the details necessary to understand how much of the target will be achieved through State actions (such as the low-carbon fuel standard) and how much will be achieved by local action. Even after this inventory is complete, it is recognized that for most projects there is no clear or established method to determine if a particular project will negatively impact the ability of the State to meet the emissions goals.

Table 4.10-5
Build It Green Point System – Proposed Project Compliance (Single-Family Units)

Point Category	Potential Points
Site (Includes demolition, construction waste, topsoil preservation, use of recycled-content aggregate)	**12 points**
Foundation (Includes use of recycled fly ash or slag in place of Portland cement, and use of structural pest controls)	**8 points**
Landscaping (Includes resource efficient landscaping, minimization of turf, use of shade trees, and installation of high-efficiency irrigation systems)	**31 Points**
Structural Frame and Building Envelope (Includes use of engineered lumber, FSC certified wood, and thermal mass considerations)	**36 Points**
Exterior Finish (Includes use of durable and noncombustible siding and roofing, and recycled content or FSC certified decking)	**7 Points**
Insulation (Includes use of recycled content insulation, low-emitting insulation, and inspection of insulation prior to drywall installation)	**5 Points**
Plumbing (Includes domestic hot water efficiency measures and high efficiency toilets)	**17 Points**
Heating, Ventilation & Air Conditioning (Includes HVAC standards, ductwork standards, and mechanical ventilation systems)	**37 points**
Renewable Energy (Includes solar water heating and photovoltaic)	**34 Points**
Building Performance (Includes diagnostic evaluations, Energy Star certification, and a requirement that all buildings exceed Title 24 by a minimum of 15 percent)	**39 Points**
Finishes (Includes use of low-VOC or Zero-VOC finishes, recycled content paint, and reduction of formaldehyde in finishes)	**22 Points**
Flooring (Includes various flooring alternatives and thermal mass considerations)	**7 Points**
Appliances (Includes standards for appliances and consideration for recycling and composting facilities.)	**12 Points**
Other (Includes community design measures and allows for innovative measures that achieve green building objectives)	**43 Points**
Total Possible	**310 Points**

Source: Build It Green, http://www.builditgreen.org/greenpoint-rated/guidelines.

At the time of this writing, a host of white papers on the subject have been published, and many conferences and workshops are being held each month. While all conclude that actions must be taken, the subject of significance criteria is a matter of great debate.

It should be noted that the Davis NRC is in the process of making recommendations to the City Council regarding which GHG reduction target year should be adopted for new development occurring prior to 2010 (See Table 4.10-2).

Method of Analysis

Emissions of CO_2 were estimated using the URBEMIS-2007 (Version 9.2.4) computer program. The URBEMIS-2007 program is designed to model construction and operational emissions for land use development projects and allows for the input of project-specific information. For development sites greater than 10 acres, URBEMIS modeling default parameters assume that one-quarter of the project area could be under construction on any given day.

Project Impacts and Mitigation Measures

4.10-1 Project impacts concerning the production of GHGs.

The increase in GHG concentrations in the atmosphere has contributed to, and will continue to contribute to, increases in global average temperature and associated shifts in climatic and environmental conditions. Multiple adverse environmental effects are attributable to global climate change, such as sea level rise, increased incidence and intensity of severe weather events (e.g., heavy rainfall, droughts), and extirpation or extinction of plant and wildlife species. Given the significant adverse environmental effects linked to global climate change induced by GHGs, the emission of GHGs is considered a significant impact. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth.

Carbon Dioxide Emissions Estimate for the Wildhorse Ranch Project

Using the URBEMIS-2007 outputs contained in the Air Quality Assessment for the proposed project (Appendix D of this Draft EIR), it was determined that construction activities would result in the generation of 148.25 tons of CO_2. Following construction, the major source of GHG emissions generated by the proposed project would be vehicle source CO_2 emissions. Vehicle transportation is one of the major contributors to GHG emissions in Yolo County and the City of Davis. Vehicle emissions primarily consist of CO_2 from the tailpipe during vehicle operation. Based on the URBEMIS-2007 information, the proposed project was estimated to generate approximately 3,823.54 tons of CO_2 per year. The project emissions figures are considered to be conservative as they do not take into account the reduction in vehicle trips that would be associated with the multi-family housing component of the project. In addition, the emissions figures are

conservative because the figures were based on the proposed project including 259 residential units, as opposed to up to 191 residential units. Approximately 80 percent of the total project-related CO_2 emissions would be generated by vehicles. By comparison, the CO_2 emissions of the State of California totaled approximately 391 million tons in 2004.[8] It should be noted that while the CO_2 emissions factor does assume certain reductions in vehicle emissions due to future vehicle models operating more efficiently, the factor does not take into account additional reductions in vehicle emissions that might take place in response to AB 1493, if mobile source emission reductions are ultimately implemented through legislation.

Wildhorse Ranch Sustainability Plan

The project applicant has provided a preliminary sustainability plan that demonstrates how the project would reduce levels of project-related GHG emissions, thereby reducing the project's contribution to global climate change. The proposed strategy is to use 2009 Title 24 standards as the baseline for energy usage and then design energy reduction and mitigation from that point. The reduction program outlined below is intended to reduce energy use and GHG emissions at least 25 percent below the 2009 Title 24 standards. The mitigation program outlined in the preliminary sustainability plan will reduce energy use and GHG emissions an additional 50 percent through the use of photovoltaics and provision of electric vehicles.

Residential Energy Demand

The design strategy for the proposed project with regard to GHG mitigation is as follows: (a) Employ passive solar design so as to reduce energy demand; (b) Design the building systems and equipment so as to reduce energy use; and (c) Use photovoltaic systems to mitigate the resulting GHG emissions.

Passive Solar Design (13 percent)

The first strategy is to reduce energy demand as much as feasible through the design of the project using accepted passive solar design practices. Passive solar design reduces ongoing energy demand for heating and cooling, but has the additional advantage of adding to the comfort levels within the home.

The following are the possible elements of the project's passive solar design.

- Building orientation. The sustainability consultant for the proposed project will work with the project architect to provide the layout of the residences so as to minimize solar gain through east and west facades; the basic layout of the project as it currently stands is conducive to passive solar design principles, but some adjustment during the tentative map stage will be undergone in order to reduce the east/west wall surface. In the project development stage, the project applicant will ensure that roof orientation

(south and west) and pitch are conducive to maximize the output of the photovoltaic installations.

- Walls, floors, and roofs. Wall, floor, and roof materials will be specified so as to maximize thermal mass in order to hold energy from the sun and to maximize insulation capacity. Elaborate wall systems are not anticipated to be used.

- Glazing. The sustainability consultant for the proposed project will work with the project architect to minimize the overall area of east and west glazing and to specify appropriate e-rated windows that meet or exceed Green Building and Title 24 Standards. The proposed project will include roof awnings and overhangs to limit solar gain through windows, where necessary. In addition, a passive ventilation system will be developed, using windows and paddle circulation fans, but no ductwork.

- Reflectance. Wall colors and materials for the project would be designed to have reflectance levels greater than 0.75 and emittance levels greater than 0.7. Roofs would be reflective but covered with solar panels on south and west faces.

Building Systems and Equipment (12 percent)

The following are the possible elements of the equipment design for the project. During the project development stage, the most favorable use of the following elements will be developed to produce the 25 percent reduction with optimal quality and cost for the proposed project.

- Heating and Cooling. In Davis, residential use of the home's heating and cooling system is estimated to make up approximately 40 percent of the entire energy use of the average homeowner. In order to reduce this amount, the project would use passive thermal design combined with a high efficiency HVAC system or radiant heating and cooling system to reduce heating and cooling use well under 2009 standards. (The system would be supplemented with a low-energy nighttime air circulation system.)

- Hot Water. Hot water demand would be supplied by high-efficiency units, or possibly supplied by rooftop thermal solar systems, and supplemented with electricity from on-site photovoltaic systems.

- Lighting. The project would include lamps that exceed minimum Title 24 requirements, defined as permanently-installed high-efficiency luminares, by 50 percent. In addition, a lighting monitor that switches lights on and off and raises and lowers the light levels, as needed, would be provided.

- Appliances. Appliances installed in the proposed residences would meet Green Building standards. Builder-supplied appliance packages will include Energy Star rated appliances.

- Monitoring and Smart Metering. The project buildings would include monitors for the electric and thermal energy systems to verify their efficiency.

- Project-Specific Benefits. The proposed orchard would contribute to the GHG reduction plan through site-wide temperature reduction, carbon capture, and carbon sequestration. Each 12-inch diameter tree is estimated to sequester approximately 1,730 pounds of CO_2 equivalents.

On-Site Photovoltaic Systems (25 percent)

The passive design and energy equipment strategies associated with the project would reduce energy demand by 25 percent below 2009 Title 24 requirements. Most of the remaining residential energy use (and hence GHG emissions) would be reduced further through photovoltaic systems sized in accord with the City's Green Building standards, to the lesser of either 2.4 kilowatts (kW) or 90 percent of demand. In the instance where the roof area is insufficient to accommodate the target system size, the system would be sized to generate the most energy for the home as determined by the available roof area.

Transportation (25 percent)

GHG emissions reduction for transportation are not included in the Green Building Codes or Title 24 calculations because these standards are only concerned with building efficiency rather than project efficiency. Legal standards for project mitigation for transportation-related emissions are not available. Nonetheless, the proposed project would address the issue of vehicle emissions as an aspect of the energy sustainability via the following features:

- The project would provide garage space and hook-ups for electrical vehicles. The current sustainability plan would provide garage space for 1.5 to two cars for each residence; therefore, providing space for an electric car. The sustainability plan would include a hook-up to the PG&E grid in each garage and a separate meter so the homeowner would get the benefit of preferential PG&E rates.

- The project would provide internal bicycle paths, as well as connection to existing bicycle paths in the vicinity of the project site.

- The project intends to provide two prepaid annual passes for the Unitrans bus system for each residence, in order to encourage the use of public transit by residents of the community.

The net result of the proposed project's energy reduction and mitigation features, as discussed above, would be to reduce the net operational usage of the project by greater than 75 percent, when compared to a home that simply meets the current Title 24 requirements. These energy savings would result in corresponding GHG emissions reductions.

Multi-Family housing is substantially similar; however, points are assigned for project design considerations such as sidewalk width, provision of gathering areas, and proximity to services. As shown in Table 4.10-5, the proposed project would exceed the overall targets of the City of Davis Green Building Ordinance (300 points) by 10 points.

Project Compliance with Assembly Bill 32

In March 2008, the California Attorney General issued a paper for use by local agencies in carrying out their duties under CEQA as they relate to global warming. Included were examples of various measures that may reduce the emissions of individual projects that result in global warming. As noted in the paper, each of the measures should not be considered in isolation, but as part of a larger set of measures, that together, would help reduce GHG emissions and the effects of global warming.

Table 4.10-6 lists the measures from the California Attorney General's office that are applicable to the proposed project and indicates whether, and how, the project would conform to the measures. As indicated, the proposed project would include a number of features that would reduce the project's contribution to global warming.

Based on the information provided in Table 4.10-6, the City has determined that the proposed project would not conflict with or obstruct implementation of the goals or strategies of Executive Order S-3-05, the California Global Warming Solutions Act of 2006, or the Attorney General's suggested global warming mitigation measures. The City of Davis Green Building Ordinance would ensure that the measures are implemented.

Conclusion

As discussed above, the City is still in the process of establishing GHG reduction targets for new development occurring prior to 2010. Therefore, the City does not currently have an established threshold of significance against which the proposed project can be evaluated. Although the proposed project would implement several design standards to reduce energy use well below 2009 Title 24 standards, as well as ensure overall consistency with the latest GHG reduction measures identified by the California Attorney General, a single project cannot, on its own, feasibly mitigate impacts associated with the large-scale issue of global climate change; therefore, impacts related to GHG emissions and global climate change would remain ***significant***.

Table 4.10-6
Greenhouse Gas Emissions Measures – Wildhorse Ranch Project

Office of the California Attorney General Methods to Offset or Reduce Global Warming Impacts	Wildhorse Ranch Compliance
Energy Efficiency	
Design buildings to be energy-efficient. Site buildings to take advantage of shade, prevailing winds, landscaping and sun screens to reduce energy use.	As part of compliance with the Green Building Ordinance, the proposed project would include buildings designed to exceed existing Title 24 standards. Roofs would be oriented to ensure solar efficiency.
Install efficient lighting and lighting control systems. Use daylight as an integral part of lighting systems in buildings.	All buildings would be designed to make use of energy-efficient lighting technologies.
Install light colored "cool" roofs, cool pavements, and strategically-placed shade trees.	The project would make use of strategically-placed shade trees.
Provide information on energy management services for large energy users.	All residents would be provided with educational information regarding the energy reduction measures incorporated into the units, and how to further reduce energy use.
Install energy-efficient heating and cooling systems, appliances and equipment, and control systems.	All units would include energy-efficient heating/cooling systems and appliances.
Install light emitting diodes (LEDs) for traffic, street, and other outdoor lighting.	Traffic and street lighting would be installed in compliance with City of Davis standards, and would make use of LEDs to the extent feasible.
Limit the hours of operation of outdoor lighting.	Exterior lighting would comply with City of Davis standards and hours of operation will be dictated by security and safety requirements.
Renewable Energy	
Install solar and wind power systems, solar and tankless hot water heaters, and energy-efficient heating ventilation and air conditioning. Educate consumers about existing incentives.	As noted above, all units would include energy-efficient heating/cooling systems. In addition, residents would be educated on the existing State and national incentives regarding solar installation. Units would include efficient hot water delivery (demand-initiated tankless heating/core plumbing systems). Photovoltaic would be included where feasible.
Water Conservation and Efficiency	
Create water-efficient landscapes.	All landscaped areas would be designed to reduce their water requirements, and to take advantage of stormwater runoff. Furthermore, landscaping would make extensive use of drought tolerant species.
Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls.	Irrigation will be controlled by systems designed to ensure water-efficiency, including within the project's proposed orchard area.

Table 4.10-6
Greenhouse Gas Emissions Measures – Wildhorse Ranch Project

Office of the California Attorney General Methods to Offset or Reduce Global Warming Impacts	Wildhorse Ranch Compliance
Restrict watering methods (e.g., prohibit systems that apply water to non-vegetated surfaces) and control runoff.	All irrigation systems would be designed to ensure that water is only applied to vegetation.
Restrict the use of water for cleaning outdoor surfaces and vehicles.	All residents would be subject to any watering restrictions established by the City of Davis.
Implement low-impact development practices that maintain the existing hydrologic character of the site to manage storm water and protect the environment. (Retaining storm water runoff on-site can drastically reduce the need for energy-intensive imported water at the site.)	The proposed project would make extensive use of Low-Impact Development techniques, including vegetated swales and rain gardens. Stormwater would be routed to swales and shallow open space detention areas instead of centralized detention ponds.
Solid Waste Measures	
Reuse and recycle construction and demolition waste (including but not limited to: soil, vegetation, concrete, lumber, metal, and cardboard).	The proposed project would reuse and recycle construction and demolition waste in compliance with State law and City ordinance.
Provide interior and exterior storage areas for recyclables and green waste and adequate recycling containers located in public areas.	Recycling services are provided by Davis Waste Removal. The applicant would work with Davis Waste Removal to ensure that adequate recycling opportunities are provided to future residents.
Land Use Measures	
Include mixed-use, infill, and higher density in development projects to support the reduction of vehicle trips, promote alternatives to individual vehicle travel, and promote efficient delivery of services and goods.	The proposed project includes attached single-family townhomes, and a multi-family housing area that could be developed at a density of 21 units per acre.
Incorporate public transit into project design.	The project site is located in close proximity to bus stops for two transit systems.
Preserve and create open space and parks. Preserve existing trees, and plant replacement trees at a set ratio.	The project would include 8.31 acres of interior open space, agricultural buffers, and greenbelts. In addition, all streets would be lined with shade trees, and the project design includes an orchard area.
Include pedestrian and bicycle-only streets and plazas within developments. Create travel routes that ensure that destinations may be reached conveniently by public transportation, bicycling or walking.	The project would include a 10-foot-wide bike path connecting the existing Wildhorse community and the proposed bike trail on the east side of the project site.
Transportation and Motor Vehicles	
Limit idling time for commercial vehicles, including delivery and construction vehicles.	Idling time is limited by State law.
Use low or zero-emission vehicles, including construction vehicles.	Low and zero-emission vehicles would be used to the extent feasible.

Table 4.10-6
Greenhouse Gas Emissions Measures – Wildhorse Ranch Project

Office of the California Attorney General Methods to Offset or Reduce Global Warming Impacts	Wildhorse Ranch Compliance
Provide the necessary facilities and infrastructure to encourage the use of low or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).	The project does not include any fueling stations. Residential garages would include electrical outlets which could be used for electric vehicle charging.
Incorporate bicycle lanes and routes into street systems, new subdivisions, and large developments.	As noted above, the project would include bicycle facilities.
Incorporate bicycle-friendly intersections into street design.	The project has been designed to accommodate bicyclists.
For commercial projects, provide adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience. For large employers, provide facilities that encourage bicycle commuting, including, locked bicycle storage or covered or indoor bicycle parking.	The project does not include commercial uses.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the project's impact related to GHG emissions and global climate change. However, implementation of the mitigation measure would not reduce the impact to a less-than-significant level; therefore, the impact would remain *significant and unavoidable*.

4.10-1 *In conjunction with the submittal of a Tentative Map for the proposed project, the project applicant shall submit, for the review and approval of the Community Development Department, a sustainability plan, which demonstrates that the proposed project does not conflict with the goals and strategies of Executive Order S-3-05, the Attorney General's suggested global warming mitigation measures, or City of Davis Resolution No. 08-166. The sustainability plan shall include, but not be limited to, the compliance measures included in Table 4.10-6.*

Endnotes

[1] Deb Niemeier, Ph.D., P.E., *Carbon Development Allowances, Final Report*, September 2008.

[2] City of Davis, *City of Davis General Plan*, May 2001.

[3] Association of Environmental Professionals, *Alternative Approaches to Analyzing Greenhouse Gas Emissions and Global Climate Change in CEQA Documents*, June 29, 2007.

[4] Meehl, G.A., T.F. Stocker, W.D. Collins, P. Friedlingstein, A.T. Gaye, J.M. Gregory, A. Kitoh, R. Knutti, J.M. Murphy, A. Noda, S.C.B. Raper, I.G. Watterson, A.J. Weaver and Z.-C. Zhao, 2007: Global Climate Projections. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

[5] California Climate Change Center, *Our Changing Climate: Assessing the Risks to California*, 2006.

[6] California Climate Action Team, *Climate Action Team Report*, March 2006.

[7] *Climate Change 2007*, Ibid.

[8] California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*, Publication CEC-600-2006-013-D, 2006.